

Training for Your Best 5k

A Sensible and Educational Approach
by Chris Morin

Fitness Walking/Running

Unlike Couch to 5K programs, which are designed for runners, ours is geared for both **fitness walkers and runners.**

Summary

- Our 5K Program is designed for both fitness walkers and runners. Do not discount fitness walking. Learning to fitness walk is one of the best things you can do for your body and it can make you a better runner.
- You should be considered healthy, have no joint pain, and not at risk before starting this program. Do not do this program unless you agree to the waiver ([see waiver](#)) and answered **No** to all PAR Q questions ([see PAR Q](#))
- This program uses interval training where you have periods of fast walking OR running with periods of slower walking or running.
- The program is a form of High Intensity Interval Training (HIIT). It entails 3-5 days a week of fitness walking with spurts of fast pace walking or slow jogging initially, building to 30 minutes of fast paced walking and/or running by the end of the program. Total commitment is at least 3 days per week.
- Choose Your Program: [Fitness Walking Program Suggestions](#) or [Running Program Suggestions](#)
- To prevent injury and improve performance you should also strengthen your entire body, including your core through a muscle conditioning program. A 2016 meta-analysis of multiple studies on the impact of strength training on running found a “large beneficial effect” on running economy (the ability to use less oxygen at the same pace) and injury prevention ([see more here](#)). [See basic muscle strengthening program for runners.](#) [See basic core training program.](#)
- Understand the difference between walking and running before you start ([go to page for more details](#)). Highlights: * Running is a high impact activity, therefore it carries risk. Fitness Walking is not so there is little risk. Air Time when Running makes it a high impact activity. No air time with Walking, therefore it is a low impact activity. Ground reaction forces experienced running exceed 3-4 times a person’s body weight. Compounded on this is that these forces are placed on one leg. * Your gait is different when walking and running. The center of mass of your body is under your feet when you run, while walking your foot is ahead of your center of mass. Considering this you should land mid foot/forefoot when you run, while landing on the heel when you walk, both running and walking landing should happen with a slightly bent knee ([see page](#)). * Running is physically strenuous requiring 8X the energy/oxygen than what is needed at rest, while fitness walking is 3-5x above rest. Therefore you should be in good heart health before starting a run program. * Running burns twice as many calories as walking (3-4 mph) the same distance, but as speeds approach 5 mph or beyond walking burns as much or more than running at the same speed. * Walking can Lower Risk of Heart-Related Conditions as Much as Running and it helps reduce arthritic knee pain ([see pages](#)). * Despite what you have heard there is no increased risk of symptomatic knee osteoarthritis among normal weight runners in many sports ([see page](#)).
- What is fitness walking? Fitness Walking is Formal and Planned Walking that is Brisk/Vigorous, which faster than your normal pace of walking. Brisk is relative term. It is a pace above your walking normal pace. Fitness experts typically suggest a pace of > 3.5 miles/hour to correlate to brisk walking for most. Strong and long arm movements is a cornerstone of brisk walking as well as a strong push off that comes from the gluteal muscles (buttocks). Cadence 100-125 steps per minute around 4-6 METS, with brisk walking, while with running is 160-180 cadence and >9 METS.
- Fitness Walking will make you a better runner and/or get you in great shape. Use it between intervals when running or as a sole means of training. Work on form and Triple Extension when fitness walking, do not just walk mindlessly. *The term triple extension refers to the simultaneous extension of the hips, knees, and ankles* ([see fitness walking form](#))

Summary continued

- Stay within Yourself: What I mean by staying within oneself is to walk and/or run with only yourself in mind and not what everyone is doing. Most people have an ideal walking pace; where the body is most efficient. The same can be said about jogging/running. You have to find that pace initially and overtime that pace may speed up or it just may stay the same, but it is yours.
- Not everyone is born to be a fast and pain-free runner. There are many physical attributes that are found in a good runner, but that being said most people can start a modified running program. See Top Runner Attributes. One of the major physical attributes is aerobic ability, which is the capacity to do aerobic work aka VO2 max. It is the maximum amount of blood that your heart can push out times your maximum heart rate times the maximum ability that your muscles can pull oxygen out from the blood. Up to 50-90% of one's aerobic capacity is influenced by genetics. Another major physical attribute is that people have different proportion of red (aerobic, endurance) and white (fast, fatiguable) muscle cells, which is unchangeable in your body and is also highly genetic. So if you have more red muscle cells you are better suited to do aerobic activity. So do not go hard on your self if you are not the fastest and if you do not have these attributes, just do what you can do because you are still getting physical and mental benefits from moving.
- Running Shoes 101: Get New Shoes. Do Not start running on old ones. Find a shoe that is comfortable for you versus the shape of your foot or your foot's mechanics. Affordable mid-price range running shoes are very nearly the same as expensive running shoes. If you are new to running stay away from minimalist shoes and barefoot running for now or maybe forever.
- Fitness Walking and Running Form 101: Proper running form is essential. There is no perfect form, everyone looks slightly different, but certain key features do exist. Understanding them early will avoid picking up bad running habits that can cause injury, frustration, and inefficiency. According to a landmark Harvard study the key factor associated with injury rates in runners is a simple one: It is the impact force with which the runner's foot strikes the surface on which they are running. Runners who strike with higher force are injured significantly more frequently than runners who strike softly (see study). Also, hard run landing decreases running economy, which decreases performance (runners with good running economy use less oxygen and energy to run at a specific velocity compared to runners with less optimal economy). KEY CONCEPTS FROM THIS STUDY: Adopt an impact-absorbing forefoot strike, listen to your steps and try to make them quieter, take shorter strides if need be, and try to move horizontally and limit vertical movement (in other words do not bounce up and down). Find the foot strike pattern that feels right for you. I make a general suggestion to land heel to toe with your foot out in front of you when fitness walking (see picture). When running to land mid foot to forefoot with the foot landing under the hips (see picture). In both fitness walking and running you should land with a slightly bent knee to decrease impact forces. Arm motion is different with fitness walking and running. I suggest long arm motions, similar to cross country skiing, when fitness walking, while running arms should be bent at 90 degrees with shorter arm movements that comes from the shoulders (see arm swing matters). You should strive to glide when walking and running, propelling yourself from the glutes first, then quadriceps and hamstrings, with a strong toe off from calf (Triple Extension). Other common features of fitness walking and running form: You should have a slight forward torso lean, which will allow greater hip extension. Knee lift should be high enough to get foot in front of you, unless sprinting. Head should be up, looking ahead, with shoulder blades retracted (see picture). This will allow efficient breathing, which should go through the nose and out the mouth (see explanation). See Fitness Walking General Form Summary, See Fitness Walking General Form Summary)

Summary of self analysis

- I would suggest going over our self body analysis before you start a fitness walking/run program. These are some of the common tests I perform on people looking to start a run program. It will help you pin point areas that you may need to work on ([see first page](#)):
- Highlights:
 - * Having a healthy BMI will make you less prone to injury and a better runner ([page](#)).
 - * Understand your feet and determine if they are flat or if you over pronate ([see feet](#)). * Understand your knees and determine if you are bow legged or knocked knee ([see knees](#)). It could become problematic if you any of these conditions, especially if you ever have existing feet or knee problems. If you have I would highly suggest conditioning your feet, ankle, knees, and hips as well as the core.
 - * Perform single leg squats as a test and in your training; it is both a test of strength and balance and it a great exercise that strengthens your core and your gluteals ([see single leg squat](#))
 - * The lunge tests is essential, which is a test of ankle mobility ([see test](#)).Lack of ankle mobility has been shown to lead to injury.
 - * Make sure you have good hip extension by doing the hip extension test ([see test](#)). Limited hip extension will limit Triple Extension, which is essential in propulsion ([see importance of Triple Extension](#)).
 - * Tight and Weak Hip Flexors can limit hip extension and decrease your ability to propel yourself ([see test and exercises for hip flexors](#)).
 - * The Gluteals (aka Glutes) are an important Core Muscles. The glutes are key in propulsion, because they are key muscles in Triple Extension, which occurs during both walking and running. They are also important in protecting the knee and back ([see tests and exercises](#)).
 - * What is the Core? The easiest explanation is the musculature above the knee and below the chest, which includes to glutes. A developed core allows you to transmit forces throughout your body better. If you want to be a better runner or athlete or just be plain fit develop your core. The lateral Core is Essential for Running: It keeps the hip up, which assures knee and hip alignment. Side Bridges and Lateral Leg Lifts/Walks works the Lateral Core. [See tests and exercises for the lateral core. See core training page for more information.](#)
 - * Your lower leg, which include the calves and dorsiflexors (muscles next to the shin bone) are important in quality pain-free running. [See tests and exercises.](#)
 - • Understand pain: this is an important point ! The most frequently identified risk factor in running related injuries is a previous injury. Therefore, prevention of this first injury is very important so you should do strength and conditioning to improve performance and prevent injury. You also need to understand pain and not work through it. Pain is a sign of dysfunction.It is a sign that something is wrong.Working through it will cause more problems and more pain. Fatigue is not the same as pain. When you exercise and you have pain stop and examine.

Goals

My goal for you is to have you **finish** your best 5K race (walk/run) in terms of how you feel.

It is not about training the best time right now; it is **about health and fitness and feeling good.**

No injuries throughout your training is key as well.

Long term exercise **compliance** should be your major goal.

It is nice to be **part of an event and team to get support.**

Hopefully you **learn** something along the way and become **mindful** of what you are doing - not just going through the motion.

If you would like to be part of the support group please email me to be put on list (email me at fittec.com).

Main Feature

Less Progressive than other
5K running programs.

Focus

- **Do what you can**
- **Fitness Walking is Highlighted**

Outline

**Combination of Fitness Walking
and/or Running at different speeds**

Fitness Walking is Key!

It Develops a Great Base.

It is Restorative to Your Body.

Progressive Program

Known as Interval Training or HIIT-

High Intensity Interval Training

Outline

Who is the program for: Anyone who is in good health who have always wanted to be able to fitness walk or run injury and pain-free. Do not do this program unless you agree to the waiver ([see waiver](#)) and answered **No** to all PAR Q questions ([see PAR Q](#)).

Program: 3-5 days a week of fitness walking with spurts of fast pace walking or slow jogging initially, building to 30 minutes of fast paced walking and/or running by the end of the program. Total commitment is at least 3 days per week. This is a form of **High Intensity Interval Training**.

Muscular Training: Twice a week do muscular training exercises that will support your training.

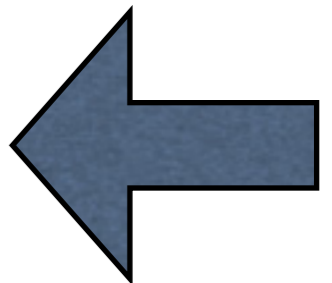
Off days: You need at least two days off per week of running. Should still walk.

Training Targets

Build up to walking/jogging/running a 5K within 9-16 weeks and to get people on a consistent pattern of fitness.

My goal is to have people accomplish one of the following.

1. Walk an entire 5k with good pace (under 1 hour)
2. Walk an entire 5k with fast pace (48 minutes)
3. Part walk and part jog an entire 5k (45 minutes)
4. Jog an entire 5k with slow pace (35-42 minutes)
5. Jog an entire 5k with fair pace (32-35 minutes)
6. Run an entire 5k with good pace (<32 minutes)





Want a more defined Goal see the I am 5K Fit Times.

Everyone should strive to be I am 5k Healthy Fit.

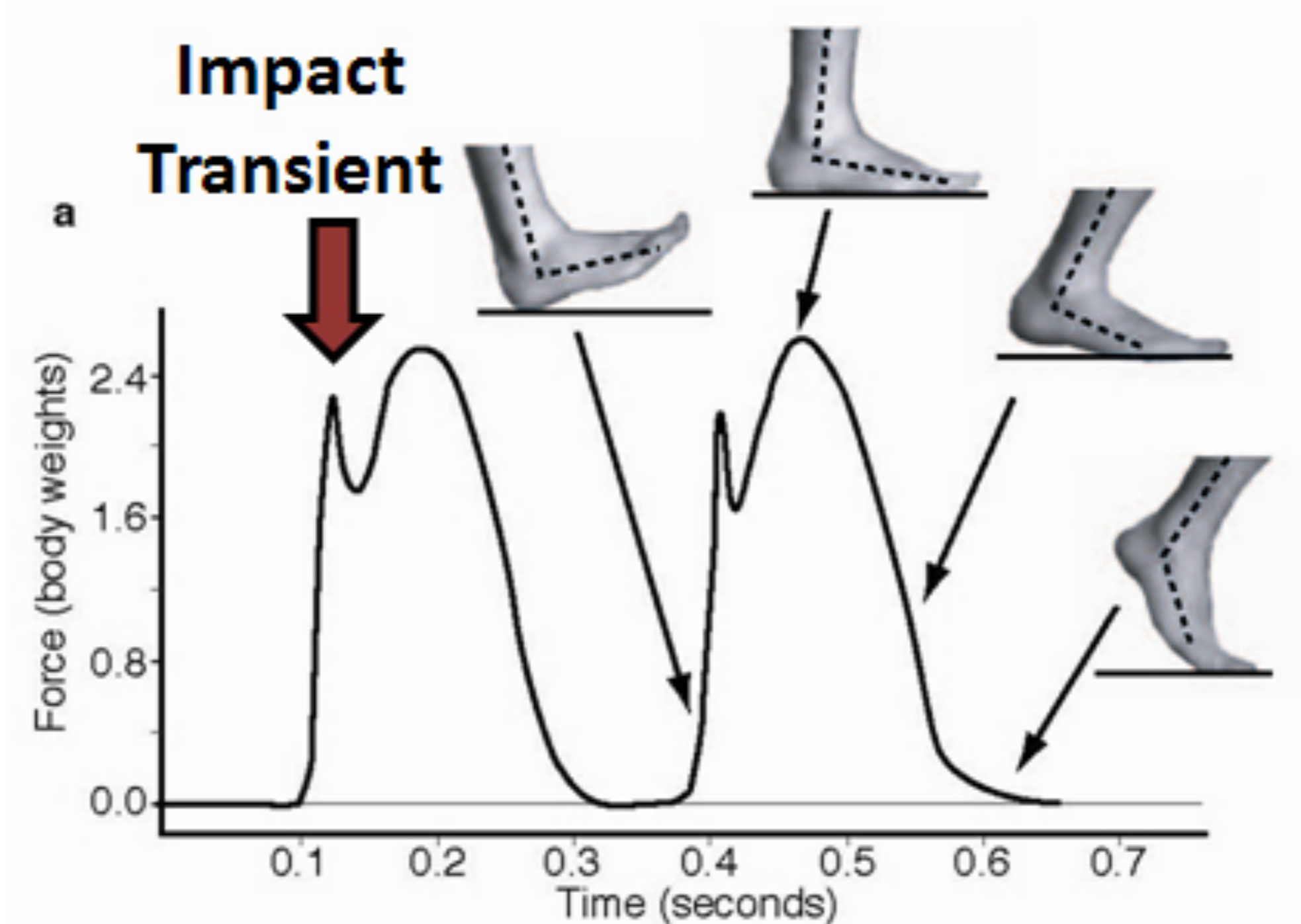
See more at fittec.us

I am 5K Modules	I am 5K Scores
I am 5K Healthy Fit	The ability to walk a 5K briskly is a good marker of health. Generally speaking the ability to walk a 5K in 44-47 minutes for most ages is very good. This time is an average walking speed of greater than 4.0 mph. To meet the 'I am 5K Healthy Fit' desirable level your time should be under 55 minutes for a 5K. If you met the desirable time value you can consider yourself 'I am 5K Healthy' and if you like report your score.
I am 5K Fit	Female 'I am 5K Fit' desirable level reached for the 5K walk/run time (minutes) value is < 29:00 if 20-30 yrs old, < 31:30 if 30-40 yrs old, < 33:00 if 40-50 yrs old, < 36:00 if 50-60 yrs old. Male 'I am 5K Fit' desirable level reached if 5K walk/run time (minutes) value is < 25:45 if 20-30 yrs old, < 27:00 if 30-40 yrs old, < 29:00 if 40-50 yrs old, and < 31:05 if 50-60 yrs old. If you met the desirable time value you can consider yourself 'I am 5K Fit' and if you like report your score.
I am 5K xFit	Female 'I am 5K xFit' desirable level reached if 5K walk/run time (minutes) value is < 26:00 if 20-30 yrs old, < 28:30 if 30-40 yrs old, < 30:30 if 40-50 yrs old, and < 34:00 if 50-60 yrs old. Male 'I am 5K xFit' desirable level reached if 5K walk/run (minutes) time value is < 23:00 if 20-30 yrs old, < 24:00 if 30-40 yrs old, < 25:00 if 40-50 yrs old, and < 27:00 if 50-60 yrs old. If you met the desirable time value you can consider yourself 'I am 5K xFit' and if you like report your score.
I am 5K Silver Modules	I am 5K Silver is for those 60+ in age
I am 5K Healthy sFit	The ability to walk a 5K briskly is a good marker of health. Generally speaking the ability to walk a 5K in 60 minutes for most seniors is very good. This time is an average walking speed of greater than 3.0 mph. To meet the 'I am 5K Healthy sFit' desirable level your time should be under 60 minutes for a 5K. If you met the desirable time value you can consider yourself 'I am 5K Healthy' and if you like report your score.
I am 5K sFit	Female 'I am silver 5K Fit' desirable level reached for the 5K walk/run time (minutes) value is <52.15 if 60-65 yrs old, <54.19 if 65-70 yrs old, <60.22 if 70-75 yrs old, <62.00 if 75-80 yrs old. Male 'I am silver 5K Fit' desirable level reached for the 5K walk/run time (minutes) value is <52.15 if 60-65 yrs old, <54.19 if 65-70 yrs old, <60.27 if 70-75 yrs old, <62 if 75-80 yrs old. If you met the desirable time value you can consider yourself 'I am 5K sFit' and if you like report your score.
I am 5K sxFit	Female 'I am silver 5K Fit' desirable level reached for the 5K walk/run time (minutes) value is <38 if 60-65 yrs old, <42.5 if 65-70 yrs old, <49.5 if 70-75 yrs old. Male 'I am silver 5K Fit' desirable level reached for the 5K walk/run time (minutes) value is <32 if 60-65 yrs old, <38.5 if 65-70 yrs old, <43.5 if 70-75 yrs old. If you met the desirable time value you can consider yourself 'I am 5K sxFit' and if you like report your score.

Walking and Running Differences and Benefits

First Disclaimer: Running is high impact activity. Fitness Walking is not.

Ground reaction forces experienced running well exceed 3-4 times a person's body weight. Compounded on this is that these forces are placed on one leg. Running can be dangerous if you do not do it right. The good thing is research suggest that may not cause arthritis. It actually may prevent it. ([See article](#))



Key Difference Between Walking, Jogging, and Running

Running is typically defined as a forward motion where both feet leave the ground for an instant during each stride.

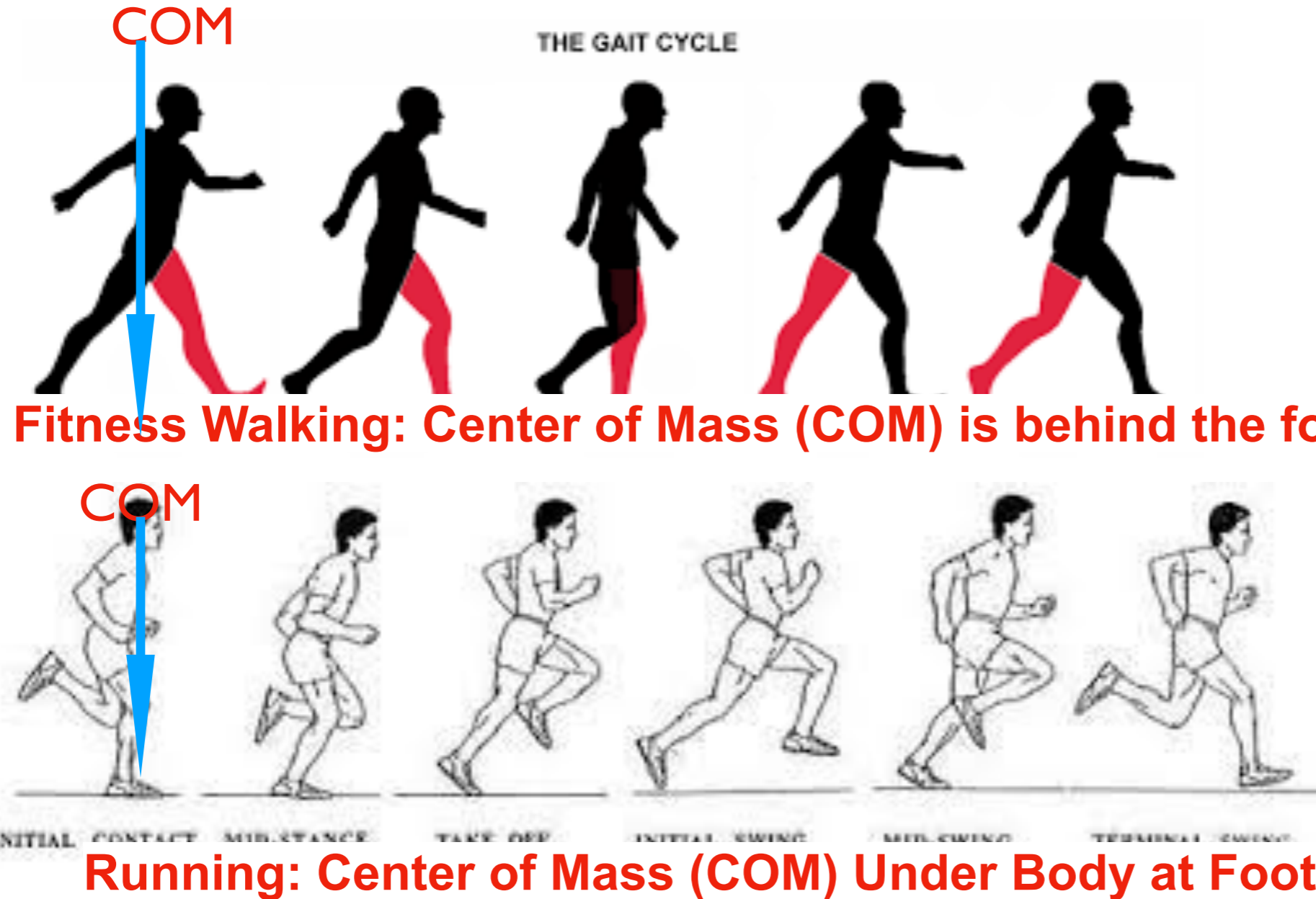
While walking one foot is always on the ground.

Jogging is simply running slowly and leisurely. *Running a mile in eight to nine minutes or less is considered running while taking longer than that to run a mile is defined as jogging or slow running.*



Air Time when Running makes it Running High Impact. No Air Time with Walking

Key Difference Between Fitness Walking and Running is Foot Strike.



Fitness Walking: Foot Strike is at Heel

Running: Foot Strike is at Mid-foot to Forefoot

Running gait differs from walking gait analysis. Whereas the swing phase in walking gait involves striking the heel, running gait generally involves a mid-foot strike with more forefoot landing as running speed is increased. Running gait also incorporates more full-body movement than walking.

Second Disclaimer: Running is strenuous. Fitness Walking can be too.

Running is also an intense form of exercise.

Make sure you are healthy to start.

You can clearly understand this when looking at oxygen requirements during different running speeds. 1 MET is the amount of oxygen you need at rest.

Running a slow mile is 9 METS; so you are doing 9x the work as compared to a resting state.

Do not do this program unless you agree to the waiver ([see waiver](#)) and answered **No** to all PAR Q questions ([see PAR Q](#)).

ACTIVITIES METS

REST	1.0
BILLIARDS	2.5
FISHING	2-4
BOWLING	2-4
TABLE TENNIS	3-5
WALKING	3-6
EXERCISE BIKE (LOW LEVELS)	3-6
VOLLEYBALL	3-6
LIGHT CONDITIONING EXERCISE	4-6
HANDBALL	3-7
DANCING (SOCIAL)	4-7
SKIING (WATER)	5-7
SKIING (DOWNHILL)	5-8
BASKETBALL (NON GAME)	3-9
TENNIS	4-9
STAIR CLIMBING	4-8
SWIMMING	4-8
AEROBIC DANCE	6-9
CLIMBING HILLS	5-10
HEAVY CONDITIONING EXERCISE	6-8
EXERCISE BIKE	6-12
SOCCER	6-12
SKIING (CROSS COUNTRY)	6-12
BASKETBALL (GAME)	7-12
SQUASH/RACQUETBALL	8-12
SNOW SHOEING	8-14
ROPE JUMPING (60-80 SKIPS/MIN)	9
RUNNING (12 MIN MILE)	8.7
RUNNING (11 MIN MILE)	9.4
RUNNING (10 MIN MILE)	10.2
RUNNING (9 MIN MILE)	11.2
RUNNING (8 MIN MILE)	12.5
RUNNING (7 MIN MILE)	14.1

Calorie difference between Walking and Running

Calories Expended through Walking and Running

The relative Net Calories Burnt of running a mile in 9:30 versus walking the same mile in 19:00. Male subjects burned 105 calories running, 52 walking; the women, 91 and 43. That is, running burns twice as many net calories per mile as walking. Since you can run two miles in the time it takes to walk one mile, running burns four times as many net calories per hour as walking.

Running burn twice the amount of calories than walking the same distance.

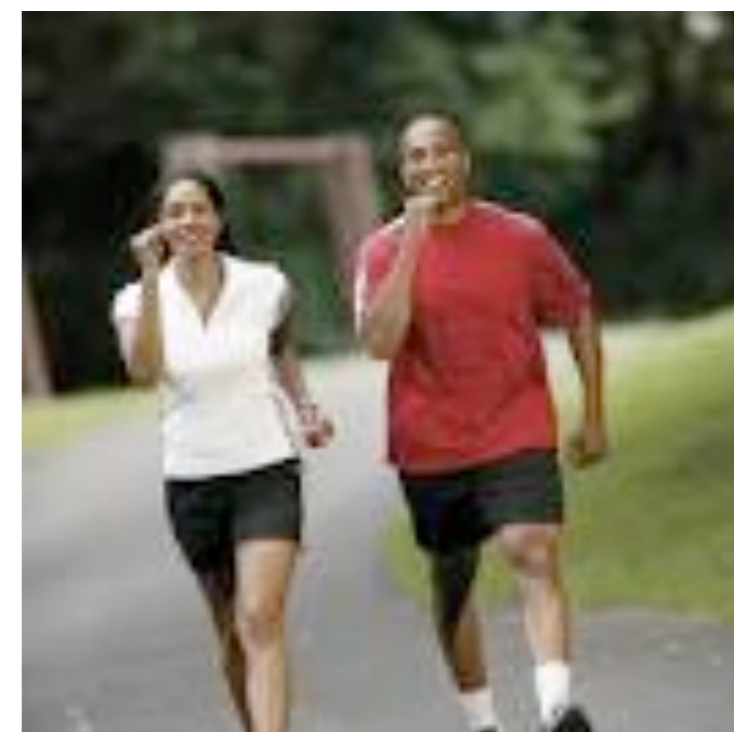
The walking formulas apply to speeds of 3 to 4 mph, but not at faster speeds.

Very Fast Walking at 5 mph and faster burns more calories than running at the same speed.

Walking is very healthy. Can Lower Risk of Heart-Related Conditions as Much as Running

Walking briskly can lower your risk of high blood pressure, high cholesterol and diabetes as much as running can, according to surprising findings reported in the American Heart Association journal *Arteriosclerosis, Thrombosis and Vascular Biology*.

Researchers analyzed 33,060 runners in the National Runners' Health Study and 15,045 walkers in the National Walkers' Health Study. They found that the same energy used for moderate intensity walking and vigorous intensity running resulted in similar reductions in risk for high blood pressure, high cholesterol, diabetes, and possibly coronary heart disease over the study's six years.



RUNNERS SHOULD TRY TO INCORPORATE FAST (Fitness) WALKING

Walking very fast (4.5-5 mph) at points can be a good alternative to running.

It is less Impactful and Builds a Muscular Base. Try it During a Training Session or Once or Twice Week. Fitness Walking can make you a better runner.

Walking Has So Many Benefits

Walking improves fitness, cardiac health, alleviates depression and fatigue, improves mood, creates less stress on joints and reduces pain, can prevent weight gain, reduce risk for cancer and chronic disease, improve endurance, circulation, and posture, and improves cognitive function/ increases creativity.

Brisk Walking is one of the best things you can do for your body.

Great for Pain Reduction: The natural inclination of many is to think that movement, including walking, will worsen pain. The opposite is actually true. When you do not move your joints and use your muscles, pain often becomes worse. Gentle exercise like walking can help alleviate pain.

Less Stiff Joints: Lack of exercise actually can make your joints even more painful and stiff. That's because keeping your muscles and surrounding tissue strong is crucial to maintaining support for your bones. Not walking and exercising weakens those supporting muscles, creating more stress on your joints.

Walking is Part of all my Joint Health Care Programs. Got a sore back I say walk, sore neck, I say Walk, sore shoulder I say walk, etc.

Walking is Great for the Knees! It reduces knee pain!

A recent study continues to support this view. It can reduce pain in those who have knee pain.

Date:

June 8, 2022

Source:

Baylor College of Medicine

Summary:

A new study reveals that walking for exercise can reduce new frequent knee pain among people age 50 and older diagnosed with knee osteoarthritis, the most common form of arthritis. Additionally, findings from the study indicate that walking for exercise may be an effective treatment to slow the damage that occurs within the joint. "People diagnosed with knee osteoarthritis should walk for exercise, particularly if they do not have daily knee pain," advises Lo. "If you already have daily knee pain, there still might be a benefit, especially if you have the kind of arthritis where your knees are bow-legged."

Important Question: Does Running cause Arthritis ? NOPE

There is an increased risk of arthritis in many sports like soccer and tennis, but not with recreational running. There is no increased risk of symptomatic knee osteoarthritis among normal weight runners compared with non-runners in a cohort recruited. In those without osteoarthritis, running does not appear detrimental to the knees (see study). Another study found that among individuals 50 years old and older with knee osteoarthritis ie OA, self-selected running is associated with improved knee pain and not with worsening knee pain or radiographically defined structural progression (study). Another interesting study found that recreational runners had a lower occurrence of OA compared with competitive runners and controls. These results indicated that a more sedentary lifestyle or long exposure to high-volume and/or high-intensity running are both associated with hip and/or knee OA. Runners were regarded as "competitive" if they were reported as professional/elite athletes or participated in international competitions (study).

Sport Participation and Risk of Osteoarthritis

Know Your Joints
Muscle and Joint Care Suggestions

Sport participation may increase the risk of osteoarthritis (OA), but it is unclear whether this is due to the specific sport, a sport-related injury, or some other unknown factor. One study has found participation in certain sports (eg, soccer, elite-level long-distance running (marathon training), competitive weight lifting (Olympic), wrestling may be associated with knee osteoarthritis (OA) later in life (study). The magnitudes of association were relatively large: those in elite long-distance running, soccer, weight lifting, and wrestling had a prevalence 3 to 7 times that for unexposed persons. Participation in non-elite (high school) American football was also associated with a higher prevalence of knee OA: approximately 9 times higher, but the range was large. Additionally, elite-level throwing, handball, cross-country skiing, ice hockey, and orienteering were classified as possibly associated with an increased prevalence of knee and hip arthritis. Other studies on elite tennis players showed advance arthritic changes as well (Study). Racket sports has also been shown to hasten knee degeneration in overweight people with osteoarthritis, according to research. Those who participated in racket sports regularly had a higher degree of knee degeneration when compared with participants who regularly used an elliptical trainer during the 4 years of the study. Those in the jogging and running group in a study of overweight subjects also saw less knee degeneration than those in the racket sports group. Those who used the elliptical trainer saw the smallest amount of changes to their knee degeneration during the 4-year period. **There is no increased risk of symptomatic knee osteoarthritis among normal weight runners compared with non-runners in a cohort recruited. In those without osteoarthritis, running does not appear detrimental to the knees (see study).**

A study from the American Journal of Sports Medicine (study) found elite male athletes who participate in high-contact sports like football, soccer and rugby have a **higher risk of developing knee and hip arthritis later in life than men who exercise a little or not at all**. About 30 percent of athletes had hip or knee arthritis, compared to 19 percent who weren't athletes. **The researchers found the risk of having hip or knee arthritis was 85% higher in elite athletes. To further this athletes who had joint surgery, the risk more than doubled, in other words joint surgery may increase your chances of arthritis (study)**. The group of retired athletes included men involved in high-contact sports such as soccer and hockey, and those who participated in non-contact sports like running, swimming and cycling. The author recommends activities that don't have the same risk of injury such as swimming, cycling, moderate running, and yoga. They also suggest, as I do, that there are strategies in every sport to decrease injury, which includes proper form and overall fitness regimen. It also must be stressed that if you have an injury, make sure you're recovered and rehabilitated before returning to the sport. **From the aforementioned studies it is clear that many contact and change in direction sports carries joints risks.**

Many health authorities suggest physical activity regardless of the type of sport may have health benefits that outweigh the risk of arthritis, like cardiovascular fitness, lower rates of obesity and lower blood pressure as well as other benefits like confidence building and teamwork that comes from being on a team. If you are going to do a sport make sure you condition for the sport and pick sports that do not have contact.

According to the BJM despite these fears, recreational running does not have negative consequences on knee joint articular cartilage in runners without symptomatic knee osteoarthritis and may actually be beneficial for long-term joint health



From Newsletter

What is Fitness Walking?

- **Fitness Walking is Formal and Planned Walking that is Brisk/Vigorous**
- **Fitness experts typically suggest a pace of 3.5 miles/hour on a treadmill to correlate to brisk walking**
- **Brisk is relative term. It is a pace above your walking normal pace.**
 - **Strong Arm Movements with Brisk Walking**
 - **Strong Push Off with Brisk Walking**
 - **Cadence 100-125 steps per minute around 4-6 METS.**
Running is 160-180 cadence and >9 METS.
- **Fitness Walking will make you a better runner and/or get you in great shape. Work on form and Triple Extension, do not just walk mindlessly.**

The term triple extension refers to the simultaneous extension of the hips, knees, and ankles. This happens during the push-off phase in running.

Fitness Walking Form

Fitness walking form is almost the same as Running except foot strike is more at the Heel and there is a longer arm swing, where the arms are not as bent..

Proper Walking Step Motion

1. Strike the ground first **heel to mid-foot** with **unlocked knee** to prevent over striding.
2. Roll through the step from heel to toe.
3. Push off strong from glutes to toes.
4. Bring the back leg forward to strike again with the heel.
5. Arms Swing should be strong backwards and bent at 90 to 160 degrees, unlike running which is at 90 to 110. Like you have **Nordic Poles**

The push off by your rear foot is the key to walking with power and speed. As you walk with the good posture and roll-through from mid foot/heel to toe, concentrate on keeping the back foot on the ground longer and giving yourself a good push off. Think about keeping your stride shorter in front. As you get comfortable with this new walking pattern, you can increase speed by taking more smaller steps. This is what fast walkers do rather than over-striding

Key Point:
Stay within
Yourself

Key Point-Staying within Yourself

What I mean by staying within oneself is to walk and run with only yourself in mind and not what everyone is doing.

Most people have an ideal walking pace; where the body is most efficient. The same can be said about jogging/running.

You have to find that pace initially and overtime that pace may speed up or it just may stay the same, but it is yours.

If you can not increase your pace do not worry. Your not going to elicit that much greater health improvements by getting a lot faster. You will accrue health improvements by being consistent within your program.

Find and own your own pace and own it.

Don't care what anyone else is doing.

Partner with someone who has the same pace.

Walking or Running at a slower pace than what is normal for you can actually create low back and/or knee pain.

Running is not for everyone.

Not everyone is born to be a fast and pain-free runner.

There are many **physical attributes** that are found in a good runner, but that being said **most** people can start a modified running program.

Top Runner Attributes

Ever Wonder Why Some Runners are SO Fast

All Different Heights -Shorter runners better on the hills, while taller runners are better on the flats

Body type - lean and linear

Muscle type - red versus white or slow versus fast
or aerobic versus anaerobic

Lactate Threshold - point where lactic acid shows up in the blood. Need to work at a higher intensity to improve this threshold.

Aerobic capacity - the capacity to do aerobic work is key

Aerobic capacity

correlated to

Speed/Time

**People are limited by genetics
Via Aerobic capacity/Fiber Type**

Aerobic endurance

correlated to

Distance

**People are not limited by genetics as
much when it comes to aerobic
endurance; can improve endurance
immensely.**

FACTORS WHICH INFLUENCE AEROBIC CAPACITY

There are many qualities that make up a great runner, but aerobic capacity is key. Some fitness professionals consider aerobic capacity to be the most important predictor of fitness.

Genetics

Up to **50-90%** of one's aerobic capacity is influenced by genetics. Simply put some people are just born to run long distances fast.

Aerobic capacity= Maximum Cardiac output= Maximum stroke volume x Maximum heart rate x O₂ absorption

Aging causes a decrease in max heart rate, which leads to a decline in aerobic capacity.

Athletes like Lance Armstrong have higher than usual maximum heart rates. Lances maximum heart rate is well over 200 beats per minute; similar age people would be 175 beats per minute. Lances stroke volume is also double that of an average persons.

Fiber Type Information: **HIGHLY GENETIC**

There are two types of muscle fiber, slow twitch and fast twitch. Slow twitch fibers are oxidative. Meaning that they consume a large concentration of myoglobin and can produce long lasting endurance properties. Fast twitch are non-oxidative and are designed for short burst of powerful energy. Red fibers (type 1) are also known as slow-twitch fibers, and white (type 2) are called fast-twitch fibers. White, fast fibers can also be broken into two types—2A and 2B. Red muscles have slow-twitch fibers which can contract slowly for a long period of time without fatigue. They are used during aerobic exercises and as such, rely on lots of oxygen and fat to generate energy. White muscles have fewer capillaries, myoglobin, and mitochondria. They are more explosive and powerful but fatiguable, and rely more on carbohydrate for energy and less on oxygen to to do work.

Example: An Olympic sprinter, for example, may have around 80% fast-twitch, white fibers, and a good marathoner the reverse. Fiber type propensity may also determine to some extent your ability to run a fast mile and to lift heavy weights with speed and power and to build muscle. Really can not change your fiber type from Type 1 to Type 2 but you can change Type 2 from B to A (A is more aerobic) through cardiovascular training.

Skeletal Muscle Types

	Twitch Speed	Generation of Force	Fatigue Resistance	Fuel Source
Type I Fibers	Slow	Low	High	Triglycerides
Type IIa Fibers	Fast	High	Medium	Glycogen
Type IIb Fibers	Very Fast	Very High	Low	Glycogen

Red

- Slow twitch
- Contract slowly
- Contract for longer period of time

White

- Fast twitch
- Contract with greater force
- Only used for short bursts of effort

Type I muscle fibers are needed for long distance.
Type II a and Type II b muscle fibers are needed for power and speed.

CAN NOT CHANGE RED TO WHITE

Fiber Type How to Test Type:

We can test the athlete to determine if he or she has a predominant fast or slow twitch profile. The Counter Movement Jump and the Squat Jump may be used to estimate the dominance of fibre type. Completing both jumps it is possible to estimate the athlete's leg extensor fibre type to within 5-10% accuracy according to Bosco. However, if you do not have access to such testing equipment, simply completing a wall reach vertical jump will tell you if you are endowed with explosive qualities. If you are female and can jump over 46 cm (18 inches) vertically then you are likely to have a high fast twitch fibre composition. For males having a vertical jump height over 53 cm (21 inches) suggests that you have a high fast twitch fibre composition.

Fast twitch estimations for athletes from different sports

Sport	Men (% of fast twitch)	Women (% of fast twitch)
100-200m	48-80%	72-75%
800m	40-64%	25-55%
Shot put	50-88%	45-52%
Distance runners	25-45%	25-50%
Untrained	25-62%	25-72%



Long Distance

Type 1

Slow twitch



400m / 800m

Type 2A

Fast twitch oxydative



Short Sprints

Type 2B

Fast twitch glycolytic

Low



High

Fatigue rate

Fiber Type and Body Type

Mesomorphic

Fast

Ectomorphic

Slow



Self Body Analysis

Know your Body

Through this analysis may need to do extra conditioning to make sure you fitness walk or run pain-free. See complete list Self Body Analysis or our video

Self Body Analysis

1. Novice Runners should Determine BMI; it should be between 19 and 26 before you start a serious running program. Determine BMI. See review

**Less Body Weight = < Impact and > Speed
in most cases.**

**Very Low BMI <19 associated with stress
fractures.**

**Experienced runners with no injury history
actually may have a higher BMI according to
research, but I do not suggest.**

Self Body Analysis

2. Examine your feet

Lets look at your Feet

Standing

Look at your feet first while standing and then while running.

Standing shoulder width apart and look down at your feet. Does there seem to be an equal size arch on each foot and **does the second toe line up with the knee cap**; this is considered normal. If the arch drops and where it is flat to the ground then you may have flat feet (pes planus).

Opposite to this is where there is a high arch; where you feel the weight of your body on the outer aspect of the foot (pes cavus). Look at your arch while you run.

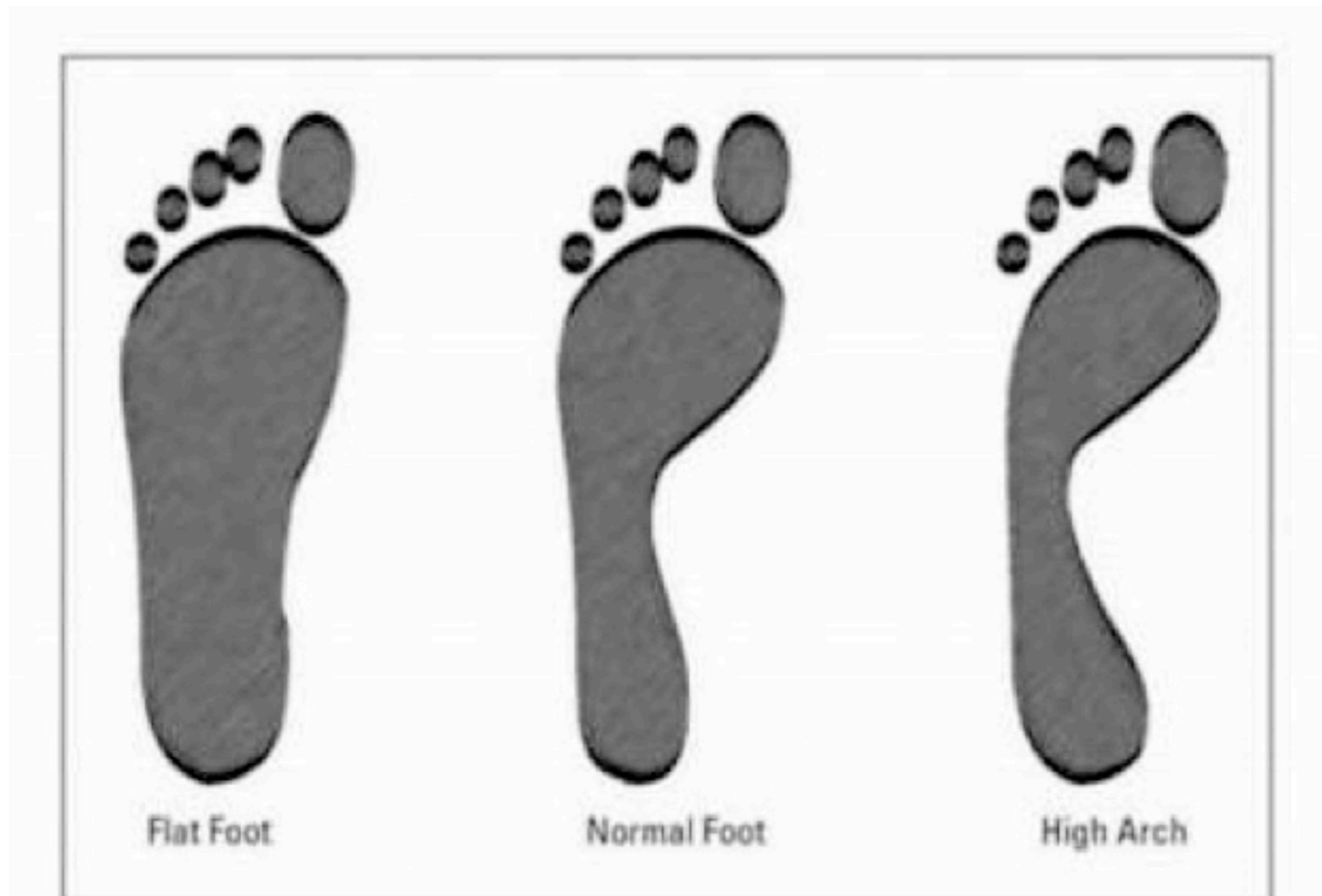
Both conditions make you more susceptible to injury, but corrective shoes may not be the answer ([read more](#)), rather foot, ankle, knee, hip, and core conditioning exercises may be.



If you are a runner and had no issues then it is not a concern. If you do have flat feet let me watch your form.

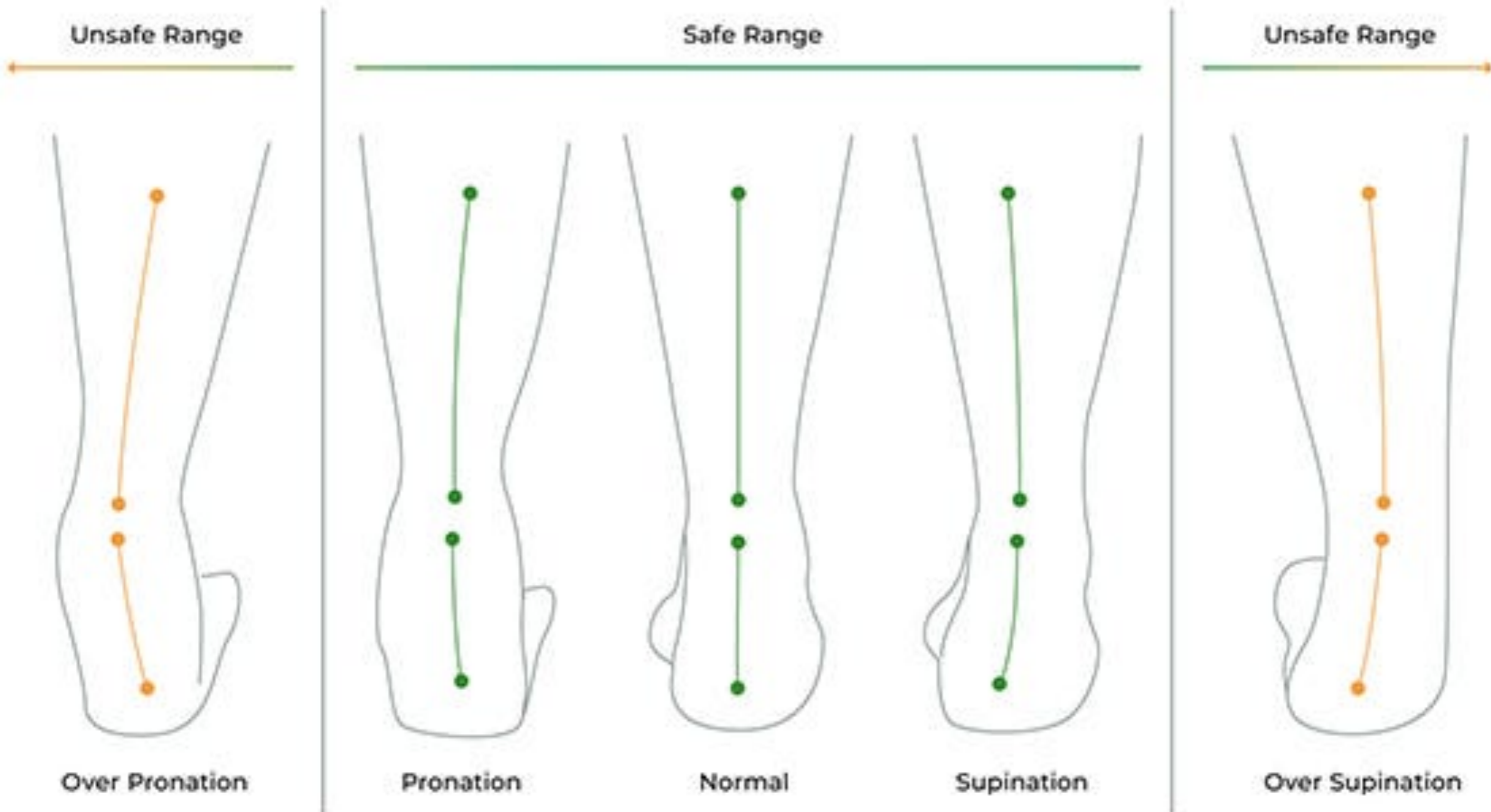
Wet Test

Another easy way to understand your feet is to wet the bottom of one foot and then step onto a flat surface. A flat foot will leave a fat, almost complete footprint. A normal foot will show about half of the arch. You can use the same technique while walking and running to see if the problem exists moving



Take a picture from the rear of your heel cord

If you are in an unsafe zone and new to running it might be a good idea to get your shoes at a running store where you are sized and fitted. Again the literature on motion control shoes and reducing injuries in runners is not supportive. More importantly are shoes that feel comfortable and supportive as well as conditioning your foot and ankle.



Side Lesson

Running Shoes

101

Running Shoes and your Feet:

When it comes to running shoes reported comfort is currently the best advice we can give regarding shoe choice for decreasing running related injuries when it comes to inserts and shoes. In other words you have to find a shoe or insert that is **comfortable for you versus the shape of your foot** or your foot's mechanics (See my article).

DO YOU/CAN YOU
DO THIS?

Short Wellness Self-Checks

Do You Have Use Motion Control Shoes Do You Over Pronate

When it comes to running shoes reported comfort is currently the best advice we can give regarding shoe choice for decreasing running related injuries when it comes to inserts and shoes. In other words you have to find a shoe or insert that is comfortable for you versus the shape of your foot or your foot's mechanics (See Study). I have often suggested motion control shoes for those who over pronate or under pronate. **The Use of these Type of Shoes might be UnHelpful for some.** A study showed that our current approach of prescribing in-shoe pronation control systems on the basis of foot type is overly simplistic and potentially injurious (See Study). Another study backs this. This prospective study demonstrated that assigning shoes based on the shape of the plantar foot surface had little influence on injuries even after considering other injury risk factors (See Study). Shoe manufacturers market motion control, stability, and cushioned shoes for plantar shapes defined as low, normal, and high, respectively. This assignment procedure is presumed to reduce injuries by compensating for differences in running mechanics. This study suggest that it does not help. Another study support this where foot pronation was not associated with increased injury risk in novice runners wearing a neutral shoe (See Study). The results of this study contradict the widespread belief that moderate foot pronation is associated with an increased risk of injury among novice runners taking up running in a neutral running shoe. **The authors suggest that despite wide based opinion that over pronating can cause injuries in runners based on current research those who “over pronate” while they run actually have a lower risk of running related injuries.** What all this suggests is that we have to rethink our shoes. We need to think about how they feel to us rather than our foot shape or how our foot moves. Bottomline: When it comes to an athletic shoe we need to find what shoe style or inserts work best for us based on how they feel.



From Newsletter

Do You Need Expensive Running Shoes: Affordable mid-price range running shoes are very nearly the same as expensive running shoes. I have found this to be true personally. That is why I typically spend moderately on my shoes and I always go for comfort and feel. ([See my article](#)).

Do You Need Minimalist Running Shoes: The popularity of running barefoot or in minimalist shoes is based on claims of injury prevention, enhanced running efficiency, and improved performance compared with standard running in shoes. **A review suggest that because of lack of high-quality evidence, no definitive conclusions can be drawn regarding specific risks or benefits to running barefoot, shod, or in minimalist shoes (See Review).**

Do YOU/CAN YOU
DO THIS?

Short Wellness Self-Checks

Do You Need Expensive Running Shoes? How about Minimalist Shoes?

NOPE: Mid-Range Price shoes works best. In a recent [Do You/Can You](#) article I wrote that [motion control shoes might be poorly suggested to some people](#). What I said it is more important is how the shoe feels (COMFORT) when you walk and/or run. Another question that comes up is do you need expensive shoes? Interestingly, according to the Washington Post a Danish Web site called [runrepeat.com](#) has crunched the numbers from nearly 135,000 consumer reviews. The biggest surprise: The higher the price, the lower the rating in many cases. In fact, the 10 most expensive running shoes, with an average list price of \$181 per pair, were rated 8.1 percent lower than the 10 cheapest models (average price \$61). The authors of the review state "If money is a matter to you, you will not get more in expensive running shoes". [Affordable mid-range running shoes are very nearly the same as expensive running shoes. I have found this to be true personally. That is why I typically spend moderately on my shoes and I always go for comfort and feel.](#) MY FEET KNOWS WHAT THEY LIKE. According to the Post article Skechers, Saucony and Vibram FiveFingers took the three spots on the podium, while Reebok, Adidas and Hoka One brought up the rear. As for the bottom of the list, the Post's author was very surprised to find HOKAs there. HOKAs is the pioneer of the current fat-sole boom. Ultra-marathoners swear by them, and lots of people are wearing them on the roads.

I also suggest not to wear your running she's all day long. Switch into another comfortable pair of shoes that offer some support. When at home go bare feet at times to condition your feet, but do not go bare foot all the time and please stay away from flip flops. HOW ABOUT BAREFOOT RUNNING SHOES The popularity of running barefoot or in minimalist shoes is based on claims of injury prevention, enhanced running efficiency, and improved performance compared with standard running in shoes. A review suggest that because of lack of high-quality evidence, no definitive conclusions can be drawn regarding specific risks or benefits to running barefoot, shod, or in minimalist shoes ([See Review](#)). [Read more on minimalist shoes here.](#)



From Newsletter

If you are interested in minimalist shoes READ more:

Are minimalist shoes better for you?

These studies found that, following the transition to minimalist shoes, runners improved running economy, reduced peak pressure under the heel and increased intrinsic foot muscle cross-sectional area, but experienced increased calf and shin pain, increased foot bone marrow oedema and a higher injury rate.

[The long-term effect of minimalist shoes on running ... - NCBI](#)

Minimalist - Better Economy but More Risks

Are minimalist shoes worth it?

The results indicated that **when running in minimalist shoes, the athletes had shorter contact times but higher peak forces on their feet.** These results were the most significant for the runners who landed on their forefeet, compared to those who had a midfoot or rearfoot-striking pattern. Jan 31, 2022

[Study: do minimalist shoes cause injuries?](#)

Do Not Wear Old Shoes

Wearing outworn shoes increases the risk of injuries, while using multiple pairs of running shoes decreases the risk of Running Related Injuries.

Running Shoes Last 300-500 Miles

You should generally replace your running shoes **every 300–500 miles**. That's because it's around this point that the midsole cushioning on most shoes will lose resiliency and stop absorbing shock as well as when newer, which can cause more impact on your muscles and joints.

Taunton JE, Ryan MB, Clement DB, et al.. A prospective study of running injuries: the Vancouver Sun Run "In Training" clinics. *Br J Sports Med* 2003;37:239–44. 10.1136/bjism.37.3.239 [[PMC free article](#)] [[PubMed](#)] [[CrossRef](#)] [[Google Scholar](#)]

Malisoux L, Ramesh J, Mann R, et al.. Can parallel use of different running shoes decrease running-related injury risk? *Scand J Med Sci Sports* 2015;25:110–5. 10.1111/sms.12154 [[PubMed](#)] [[CrossRef](#)] [[Google Scholar](#)]

PICKING RUNNING SHOES DETAILS [-see more at Runner's World](#)

- The most important thing is that your shoes are comfortable when you run.
- In general, a pair of running shoes should last between 300 to 500 miles of running (3 or 4 months for regular runners).
- Try on new shoes during the midday when the foot is at its largest.
- You should have a thumbnail's length of extra space in the toe box.
- The heel counter should be rigid.

- If you overpronate you can use a regular running shoe if you wear your orthotics, but a motion-control shoe offers the most additional support (this is questionable). Make sure you bring your orthotics when trying on new shoes.

- Foot width is an issue; you don't want a shoe that is too narrow or too wide.

- The midfoot should not be too tight, but it should be snug. Experiment with the lacing to get a proper fit.

- Take the shoes outside for a test run.

- Bring your running socks and try both shoes on. If one foot is larger than the other, buy the larger size.

- Find a good running-shoe store in your area one where the salespeople are knowledgeable.

- Expect to pay anywhere from \$60 to \$120 dollars for a new pair of running shoes.

- One study suggest there is no difference between an expensive pair of running shoes and those moderately priced if there is no anatomical issues.

- **Foot Width**
 - Most men wear a D-width shoe while most women wear a B-width. You don't have to wear a gender-specific shoes. The lasts are basically the same. Men: Try a women's shoe if you have a narrow foot. Women: Try a men's shoe if you have a larger or wider foot. If the shoe fits, wear it!

- **Overpronation and Oversupination**
 - If you overpronate or underpronate you can tell by the wear of your shoes.
 - • If you have a neutral stride, shoe wear is centralized to the ball of the foot and a small portion of the heel.
 - • Overpronation is identified by wear patterns along the inside edge of your shoe.
 - • Supination is marked by wear along the outer edge of your shoe.

- **Types of Running Shoes**
 - Cushioning shoes provide elevated shock absorption and minimal medial (arch side) support. Cushioning shoes are also good for those who oversupinate. Cushioning shoes are also good for neutral runners during off-pavement runs. Reason: Minor irregularities in surfaces such as dirt roads give feet a little variety from the repetitive, same-spot strikes they typically experience on hard surfaces.
 - Stability shoes help decelerate basic pronation. They're good for neutral runners or those who exhibit mild to moderate overpronation. Due to their extra support features, virtually all trail-running shoes fall in the stability category.
 - Motion control shoes offer features such as stiffer heels or a design built on straighter lasts to counter overpronation. They're best for runners who exhibit moderate to severe overpronation.

Shoe Lasts

The "last" refers both to the shape of a shoe and also the form, or mold, around which a shoe is constructed.

When referring to the shape of a shoe:

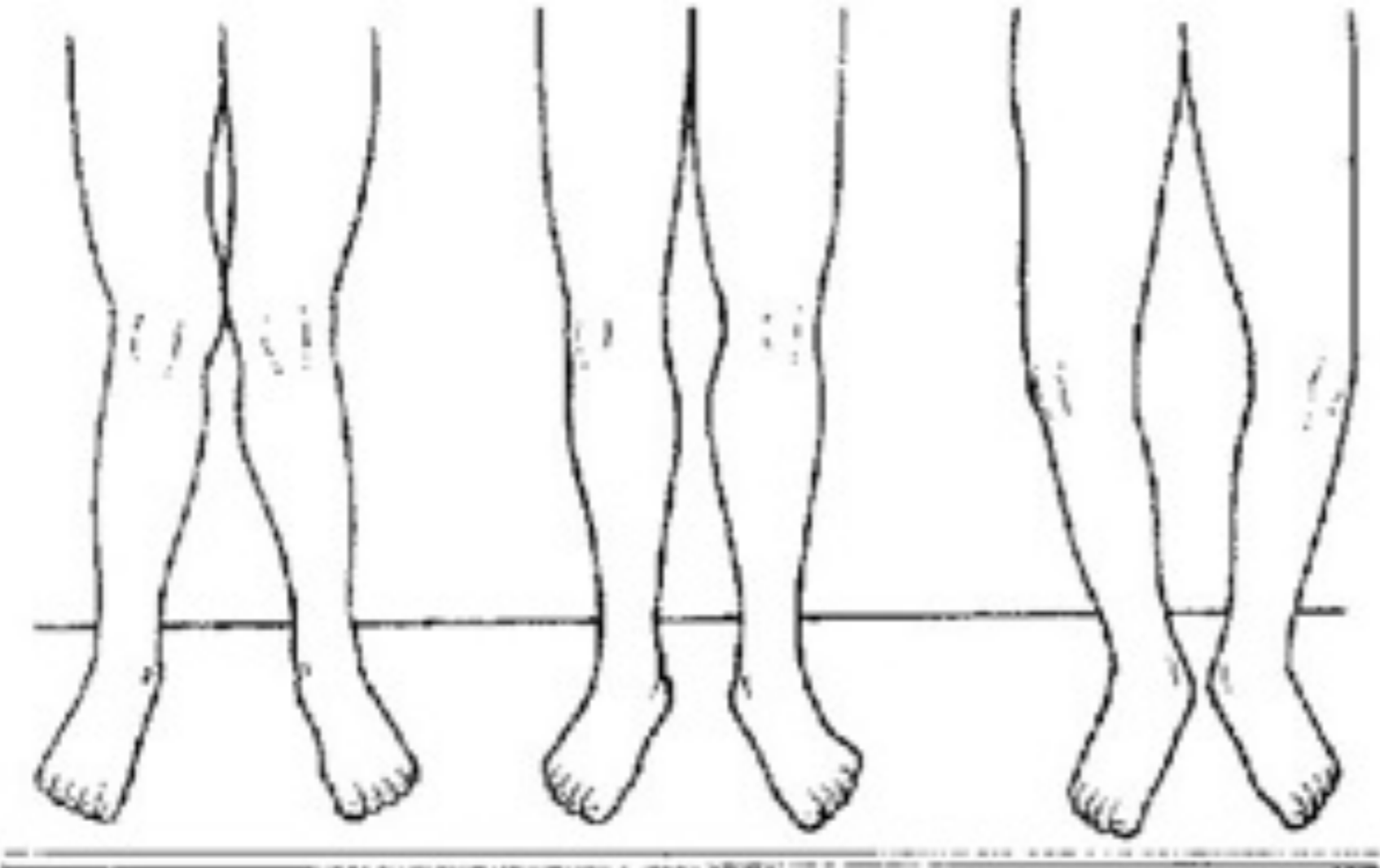
- A **straight last** is appropriate if you are an overpronator or have a flexible, flat arch. It helps to control inward motion.
- A **curved last** is designed for underpronators (oversupinators) with rigid, high arches. The curved shape promotes inward motion.
- A **semi-curved last** represents the middle ground. It is appropriate for neutral pronators.

Chris's Summary of Feet and Shoes

- Check if you over pronate or supinate in an unsafe zone. Did you ever have feet problems? If you did condition your feet, ankle, knees, and hips as well as the core. See how motion control shoes feel. If they feel better than traditional run shoes than go with them.
- Get New Shoes. Do Not start running on old ones. Find a shoe that is comfortable for you versus the shape of your foot or your foot's mechanics
- Affordable mid-price range running shoes are very nearly the same as expensive running shoes.
- If you are new to running stay away from minimalist shoes and barefoot running for now or maybe forever.

Self Body Analysis

3. Examine your knees



Genu valgum

Normal

Genu varum

Knocked Knee

Bowed Legged

Varus and Valgus deformities can lead to abnormal forces around the hip and knee joint causing several common knee disorders, including [iliotibial band syndrome](#), [patellofemoral pain syndrome](#), [chondromalacia of the patella](#), and more. Repetitive trauma to the knee, which can be caused by activities such as running or biking, combined with improper alignment, can lead to joint pain and may damage the internal structures of the knee, such as the ligaments or the menisci. Therefore there is a need for limiting running and conditioning the hips and knees for improved strength at various angles, directions, speeds, and heights for those who like to run. Hip and knee strengthening exercises in all directions with proper form, as well as balance and stability training, will help provide improved support ([see more here](#)).

Self Body Analysis

Examine Your Knees

Use a mirror, it is a good tool.

Unfortunately if you have bow legs or knock knees you may be at higher risk for injuries during high-impact exercise like aerobic dance and running type sports. Knees that deviate from the norm (either in or out) can put added strain on the joints of the entire lower body and even the upper body, especially the hips, knees, lower legs, ankles, and feet. The norm is where the when standing shoulder width apart the knee sits over your feet.

Someone who has knock knees will often pronate (the ankles and feet roll inward too much), while if bow legged person is more likely to supinate (the ankles and feet roll out). If you have either condition you may be a good candidate for an orthotic. **A physical therapist or podiatrist may prescribe inserts or a modified exercise program. Also if you have these condition when you run make sure your knee and feet line up and do not do too much mileage! If you have either condition you need to strengthen the core and the lower limbs.**

3. Examine your knees

Self Body Analysis

4. Examine your hips

Having large hips and a large Q-angle can cause problems as well.

Q angle-the angle formed by lines representing the pull of the quadriceps muscle and the axis of the patellar tendon.

There has been studies suggesting an association between a large q-angle and patellofemoral and hip pain and IT band issues.

Q Angle

An increased Q angle places more stress on the knee joint, as well as leading to increased foot pronation.



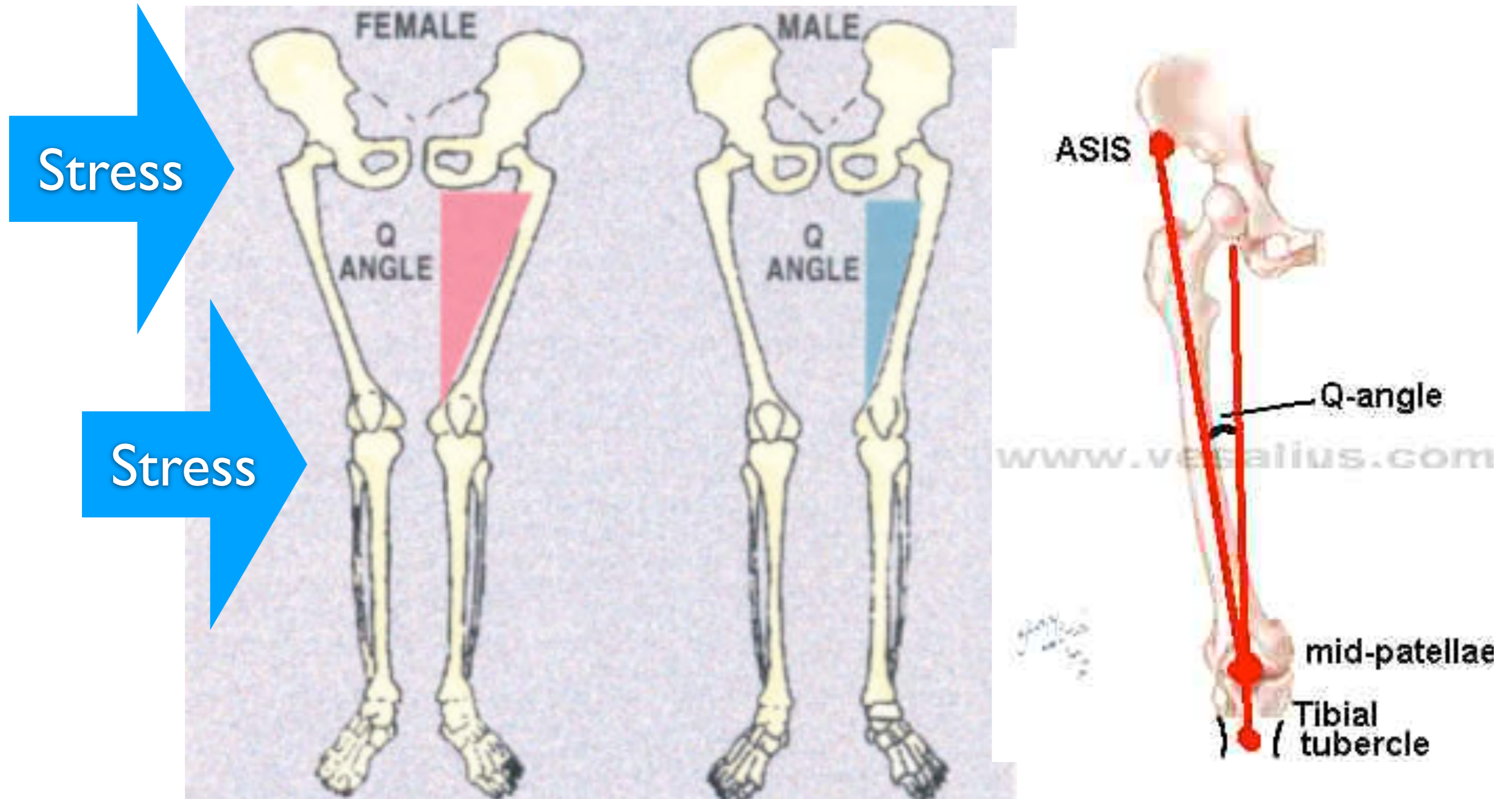
Normal

©MMG 2004



Abnormal

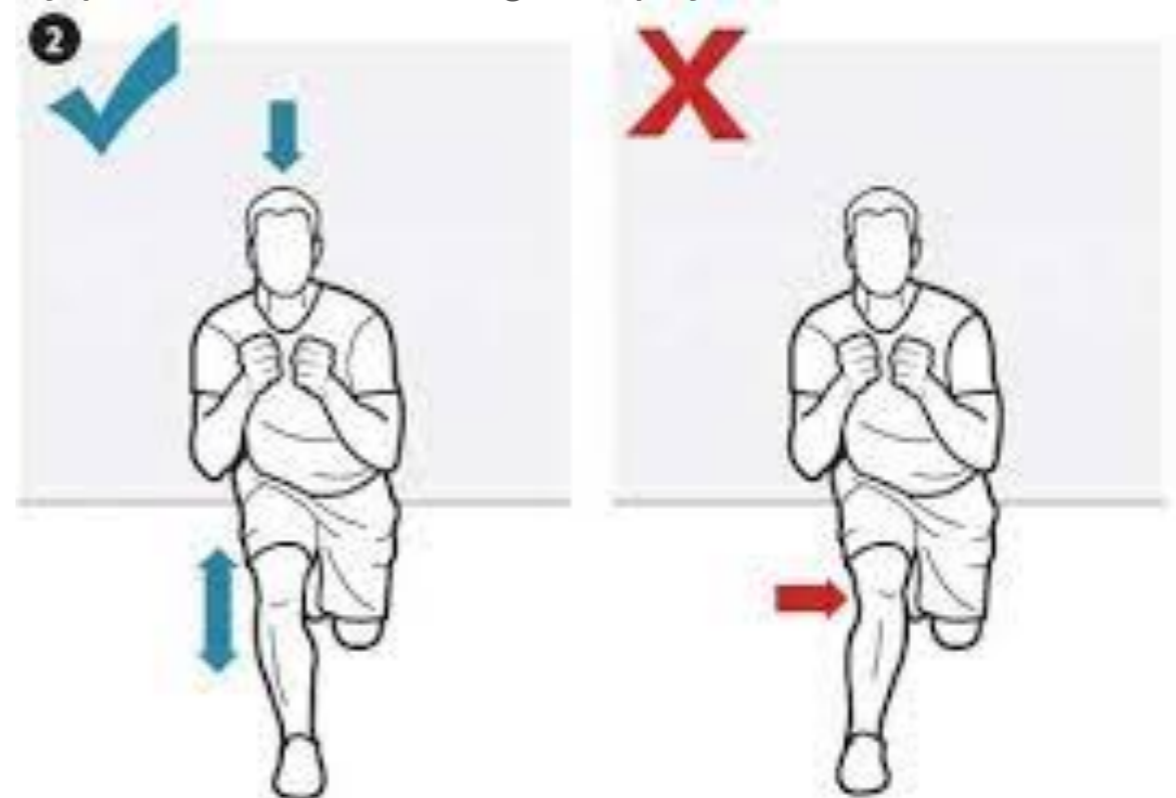
Q Angle



Large Q-angle greater stress at hip and knee. **Therefore need to strengthen the lateral hip.** Runners with a Q-angle 20° were more likely to injure their knee. Runners with a Q-angle 20° had greater time lost due to injury (Study)

Self Body Analysis: The single leg squat test is a way to determine if you need to strengthen your hips and quads if you have a large Q angle and/or Varus or Valgus Knees. It is also a great exercise that all runners should do.

The single-leg squat test SLST (also known as a single leg sit to stand test) is a test used to assess dynamic hip control and lower limb function and has practical relevance to any sport involving landing, cutting, or running. The SLST is commonly used for injury prevention screening and physical rehabilitation evaluation.



- * Hips Should Stay Level.
- * Knee Should Line up with second toe.

Great Training Exercise 3 sets 10-15 reps



Start Here Supported

PROGRESSION



Keep Hips
Level
Keep Knee
Lined up with
Second Toe



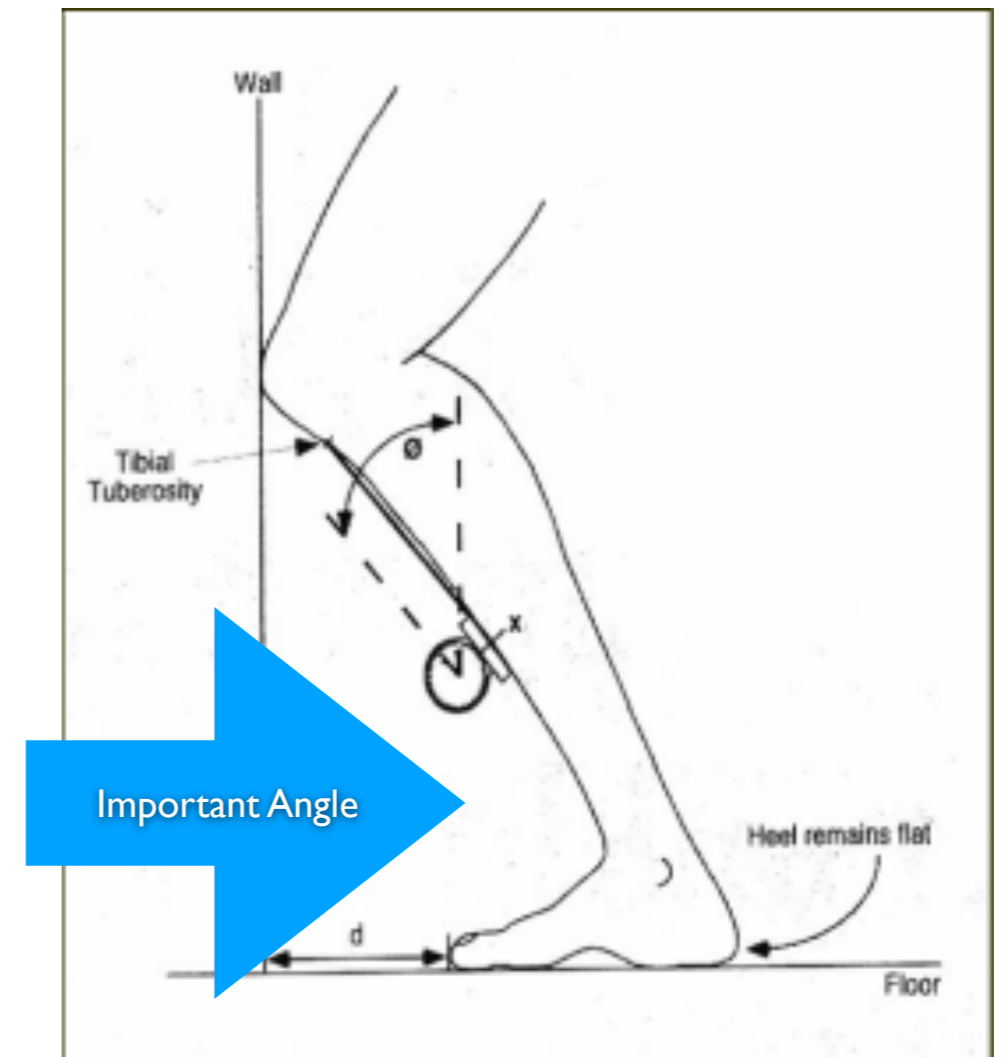
PROGRESSION

Self Body Analysis 5. Examine your ROM Flexibility Self Tests **MUST DO TEST**

Lack of mobility in the ankle will limit motion and place stress above and below.

Calf: Do you have good calf flexibility?

Stand with toes 4 inches from wall.
Keeping foot flat you should be able to touch knee to wall. If not work on stretching and strengthening the calf with this and other stretches. Both sides should be the same. A restricted Lunge test essentially suggests there is an increased ankle joint dorsiflexion stiffness. Research tells us this may increase an individual's risk for lower extremity injury. Considered one of the best tests to predict injury.



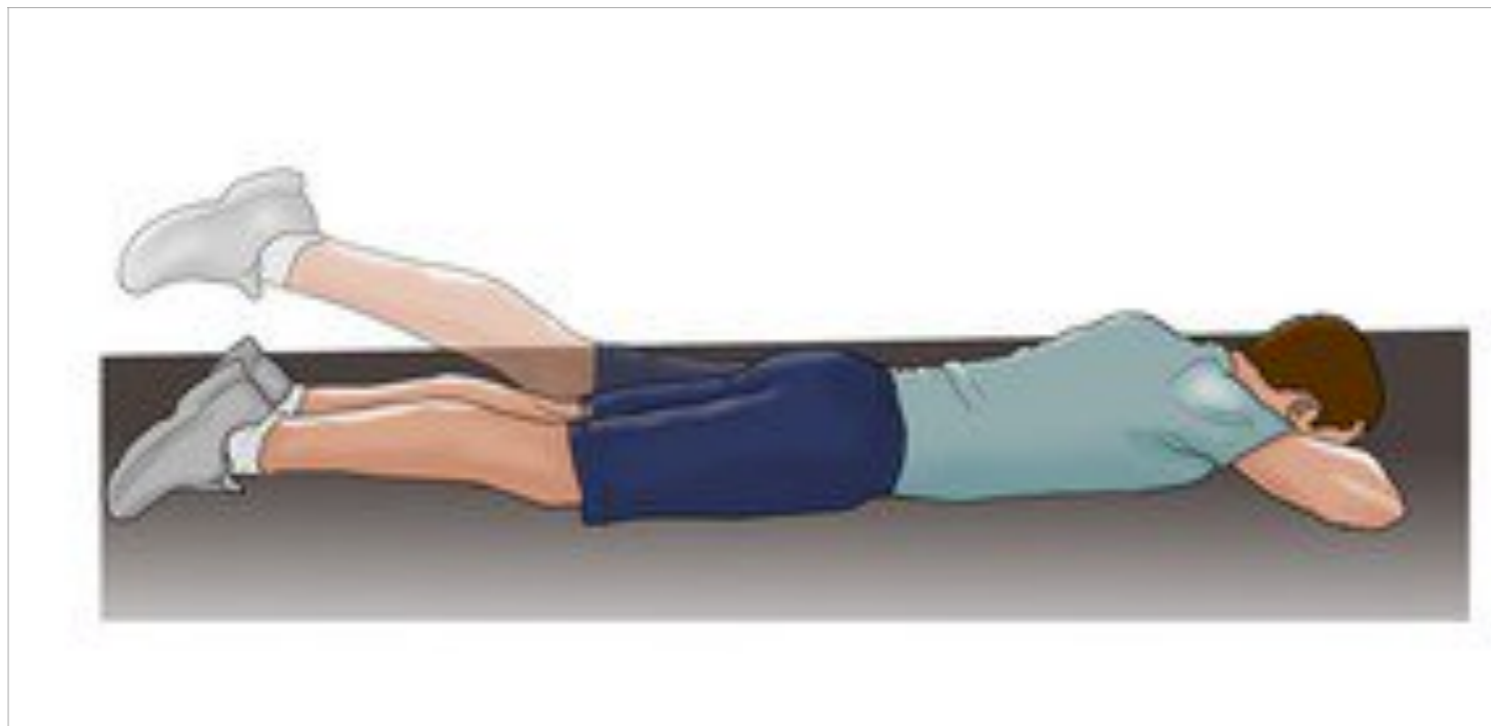
**Flat foot knee touches at 4''
at least prefer 6''**

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Flexibility-**MUST DO TEST** Prone Hip Extension

Test. Hip extension is important in propulsion. You should be able to lift it up 10-20 or more degrees. Runners are shown to extend their hip around 10-15° at 'toe off' (Koblbauer et al. 2013). Note the muscles engaged. Proper movement should come first and primarily from the gluteals with minor low back and hamstring involvement in that order. If not you may have weak glutes and tight hip flexors. You can use this test as an exercise. **WHY IS THIS IMPORTANT:** Researchers trace the biomechanical cause of many (but of course not all) running injuries to poor biomechanics around the hips and pelvis. Lying prone lift one leg up.

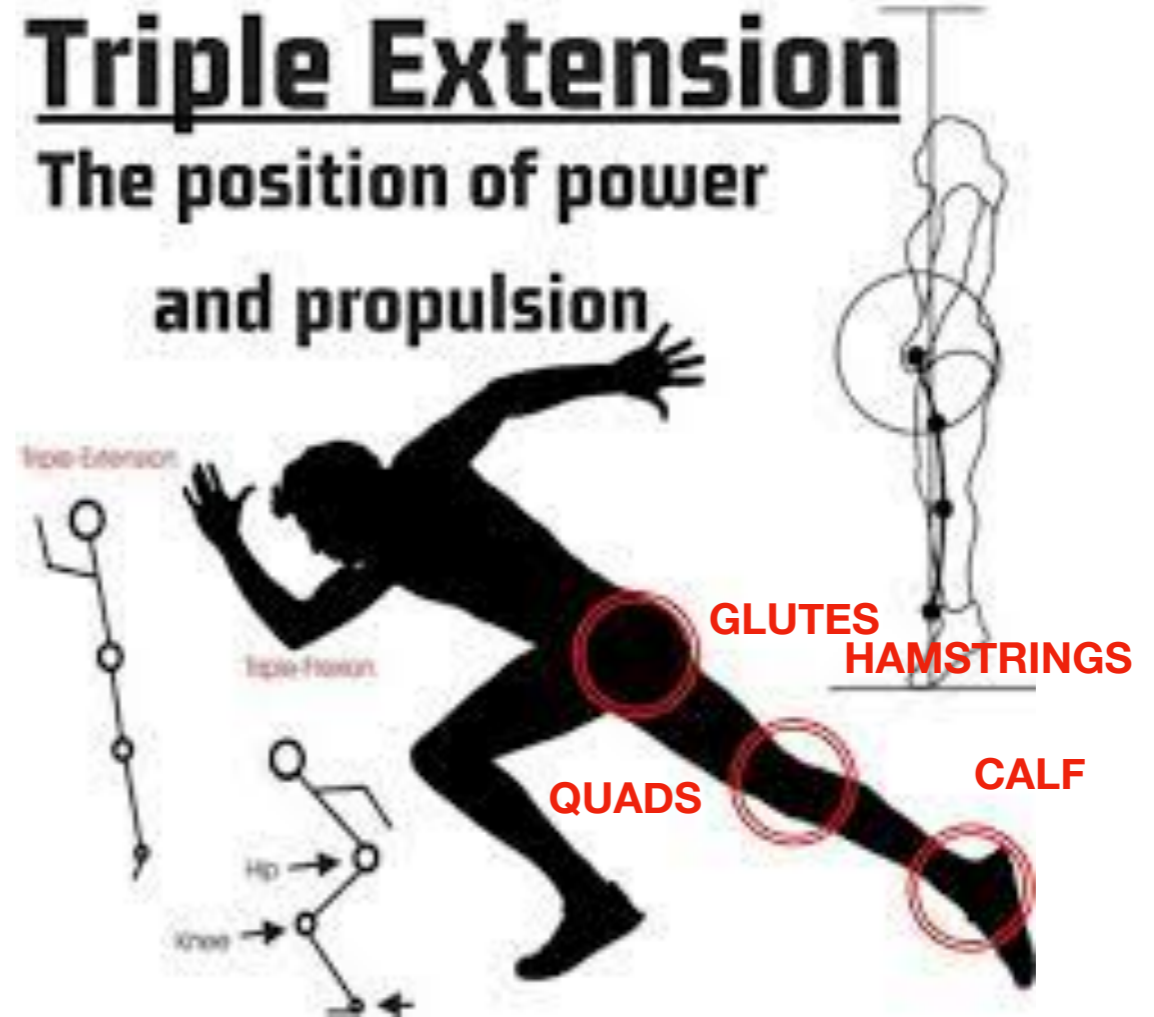


TRIPLE EXTENSION

POWER PHASE of Running starts at hip extension. If you have limited hip extension you are limiting propulsion:

Triple Extension is Key to Power Sports as well as Fitness Walking and Running

The term triple extension refers to the extension of the hips (glutes and hamstrings), knees (quads), and ankles (calf). This happens during the stance to push-off phase in fitness walking and running. Push back from the glutes, hamstrings, quads, and calves through toe off.

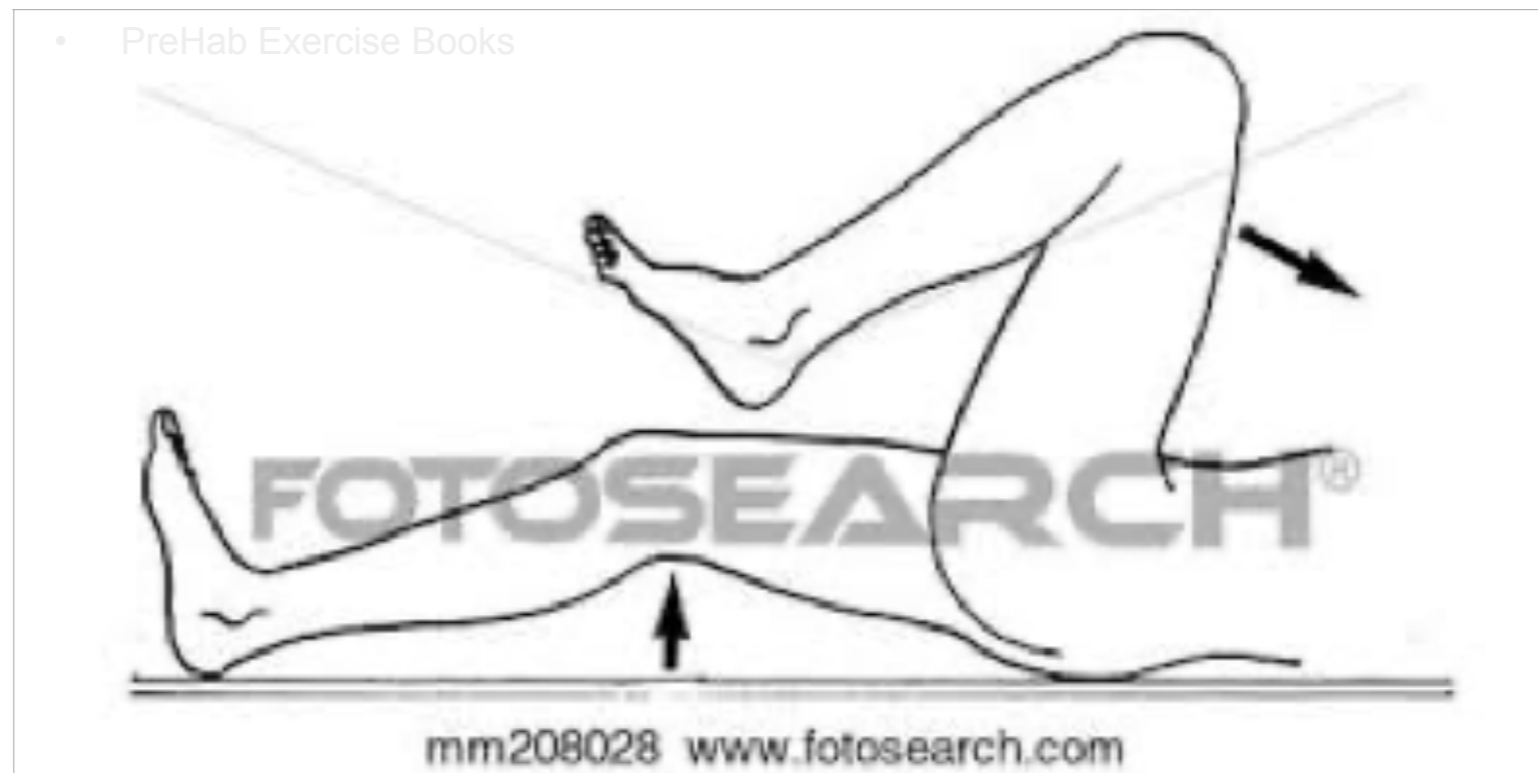


The gluteus maximus is the largest muscle in the human body. **Make sure you engaged it. HIP, KNEE, AND CALF ISSUES HAPPEN FROM WEAK GLUTES.**

5. Flexibility-Hip Flexors. Do you have adequate hip flexor flexibility?

Tight Hip Flexors may limit hip extension which will decrease propulsive forces and possibly cause back pain. While prone on floor pull one knee into chest. The opposite leg / knee should not raise up. If it does work on stretching and strengthening the hip flexors and gates. Both sides should be the same.

Some suggest **tightness or hypertonicity of the psoas muscle resulting from prolonged sitting in a flexed position** can mechanically restrict the motion of hip extension and inhibit the glutes. A tight psoas muscle will restrict hip extension range of motion, which normally is 10-20 degrees, and will result in a decreased stride.



Tight Hip Flexors may limit hip extension and inhibit the glutes (research)

HIP FLEXOR Stretching and Strengthening to Prevent and Treat Injuries ([see more here](#))



© Healthwise, Incorporated



Standing Hip Flexion

Tight Hip Flexors could be because of weakness, so strengthen. Stronger hip flexors will make you faster.

Self Body Analysis 6. Muscular Tests

6. Side Lying Leg Lift Gluteal Test - Can you lift your leg up 20x? Do both sides feel the same? If not you need to strengthen your side glutes with this exercise as well as other exercises, see below right band walks 1-3 sets of 10-20 reps



Should feel this in glutes



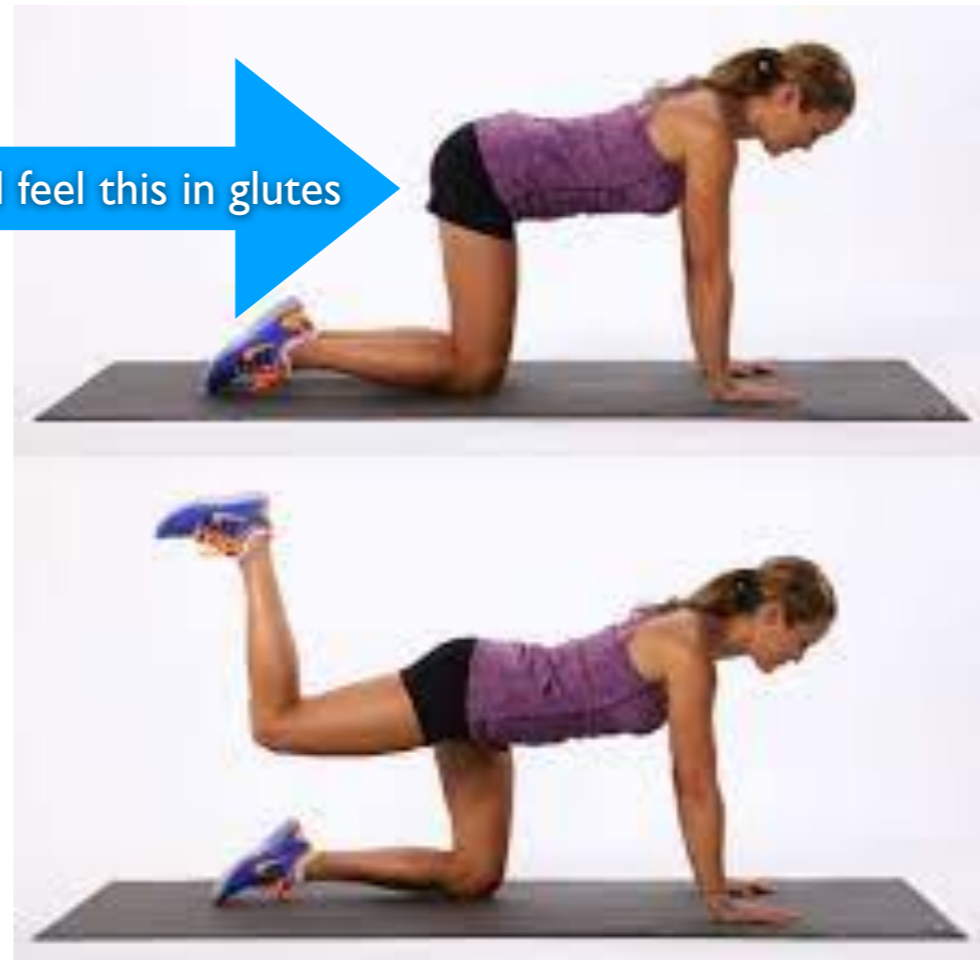
6. Donkey Kicks - Can you lift your leg up 10x? Do both sides feel the same?

MOST IMPORTANT IS THAT THE GLUTE MUSCLES - NOT YOUR HAMSTRINGS ARE THE PRIME MOVER.

If not you need to strengthen your glutes with this exercise as well as other exercises, see hip thrusts below 1-3 sets of 10-20 reps



Should feel this in glutes



Self Body Analysis 6. Muscular Tests

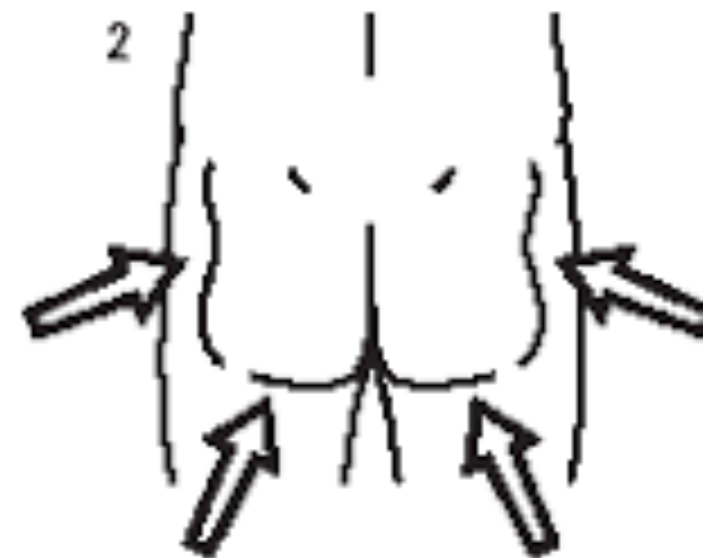
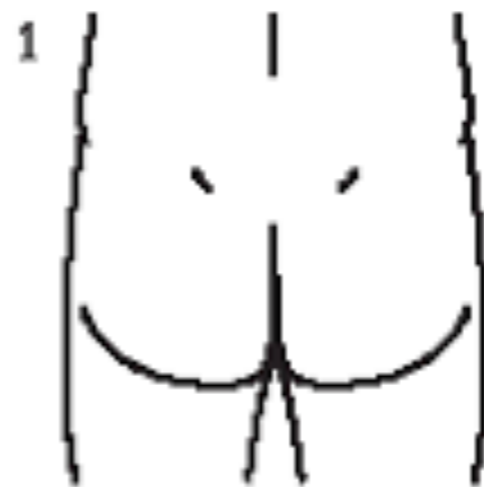
6. Single Leg Bridge - Can you hold a single leg bridge with good form for 30+ seconds? Do both sides feel the same? If not you need to strengthen your glutes with this core exercise as well as other exercises. Do 10 to 15 reps or holds for 5 to 30 seconds for multiple reps. Push through your heels.

MOST IMPORTANT IS THAT THE GLUTE MUSCLES, NOT YOUR HAMSTRINGS, ARE THE PRIME MOVER.

6. Glute Squeezes- Put both hands or buttocks and engage the muscle. Can you feel a strong engagement. Many people can not. This is a great exercise to do any time during the day. Part of My Daily Moves Program.



SINGLE LEG GLUTE BRIDGES



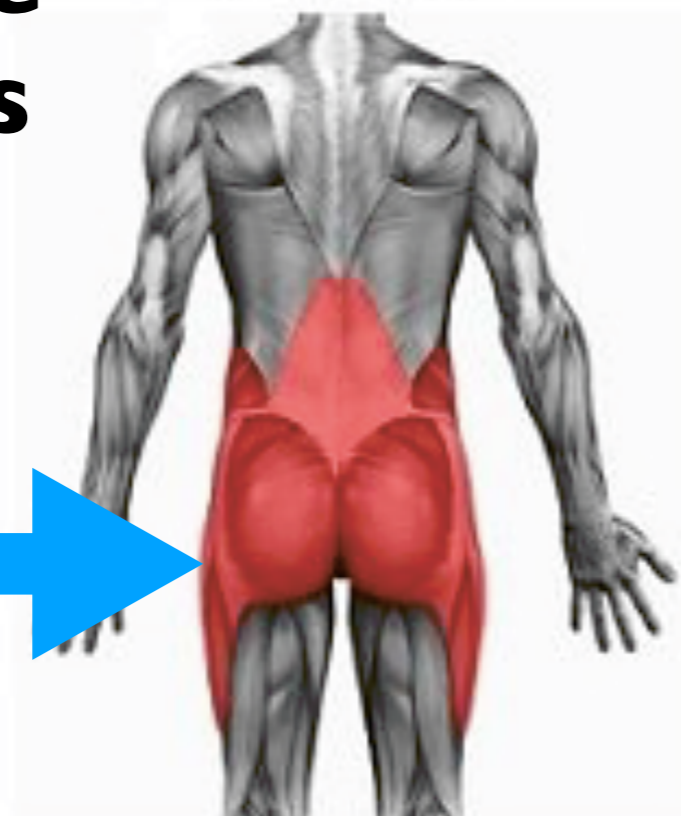
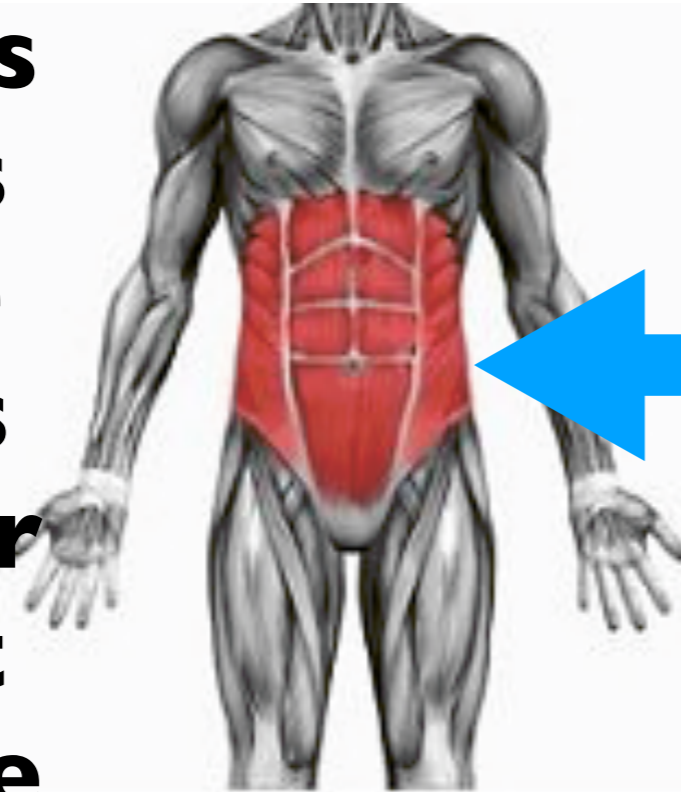
Why all these Glute Tests?

The Glutes are an important Core Muscle.

The Glutes are key in Propulsion. It is part of Triple Extension in both walking and running. They are also important in protecting the knee and back.

What is the Core? The easiest explanation is the musculature above the knee and below the chest. A developed core allows you to transmit forces throughout your body better.

The Gluteus Maximus is Part of the Core and is Essential for Running: It is one of the key muscles that drives propulsion through triple extension.

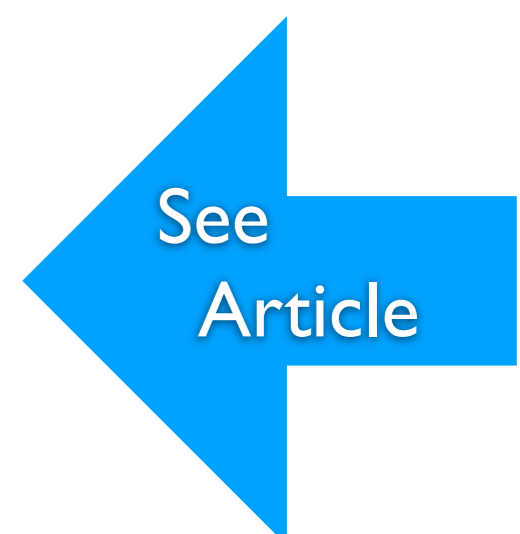


Lateral Core is Essential for Running: It Keeps the Hip Up, which assures knee and hip alignment. Side Bridges and Lateral Leg Lifts/Walks works the Lateral Core.

PERFORMANCE 101: Core Training

What is Core? The easiest explanation is everything above the knee and below the chest. **Why is it important?** A developed core allows you to transmit forces throughout your body better. If you core is weak it will be hard for you to transmit the power from your legs to your arms and vice versa, which is critical in activities of daily living and in sports like running and golf. Having a durable, stable core helps us to prevent injuries by sparing the spine from excessive load and preventing falls. The musculature of the core does this by keeping the most efficient and safe position of the spine as well as bearing some of the forces through its musculature and tendons. **What are core exercises?** Many core exercises are isometrics holds versus motions. Examples: Planks, Bridges, Bird Dogs, and Sidebridges. The reason is that the core should be developed to maintain and protect the natural curves of the spine. The best way to do that is through stabilizing isometric exercises. Also, studies have shown that endurance of the core is more important than strength when it comes to protecting the spine. *Isometric (no motion) holds develops localized endurance.*

Videos
Core Training on Floor the 5 essential core exercises
Core Training Standing



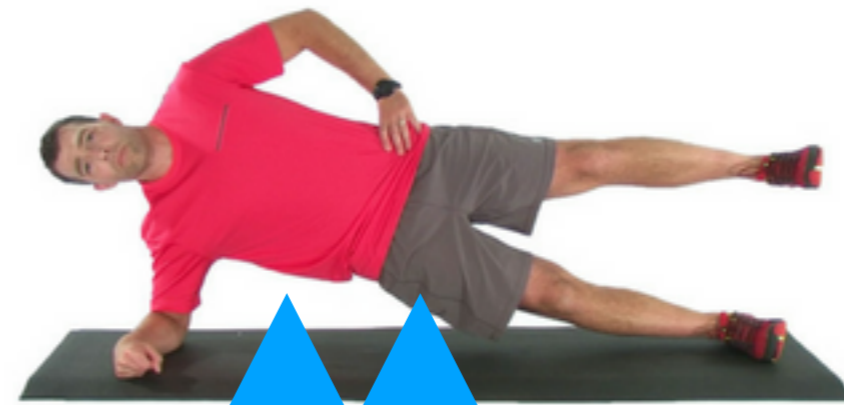
STRENGTHENING WITH THE SIDE BRIDGE ASSURES HIP STAY LEVEL AND KNEES ARE OVER TOES WHEN RUNNING AND WALKING

WHY: CORE TRAINING:

Gluteals are Part of the Core



SIDE BRIDGE PROGRESSION WITH LEG LIFT



Lateral Core and Glute Complex

Side Bridges Prevents This

Core Training - 5 Essential Exercises 3 x per week

Videos

Core Training on Floor the 5 essential core exercises

Core Training Standing

A Developed Core is one where all positions can be held for at least 60 seconds and both sides are the same.

Essential Core Training 3 or more times a week

Core training is the strengthening and conditioning of the core muscles surrounding the middle of the body—the abdomen, hips, pelvis, and lower back. These muscles protect the spine and are responsible for stabilizing and balancing the body during movement.

(see [Do It Right](#) for details)

5 Essential Core Exercises

You Can do Daily. Should do 3 or more times per week.

Great Way to Warm Up Body before a workout

I highly recommend these exercises to anyone that is following a fitness program

If just starting out perform modified version.



Planks (modified on knees)
Hold for > 15-30 seconds for 1-3 sets or 5-10 seconds for 5-10 reps



Sidebridge (modified on knees)
Hold for > 15-30 seconds for 1-3 sets or 5-10 seconds for 5-10 reps



Leg bridge (modified double leg)
Hold for > 15-30 seconds for 1-3 sets or 5-10 seconds for 5-10 reps



Bird-dog (modified raised hand out in front on floor and/or have raises leg knee bent)
Hold for > 15-30 seconds for 1-3 sets or 5-10 seconds for 5-10 reps



McGill Crunch with single bent knee 1-3 sets for 10 to 30 reps is a good goal, switch knees after 10-15 reps. Lift shoulders off floor, pause for 1 second, and repeat. Modified-If needed use hands behind head for support.

See
Article

Calf Complex is Important in Running

Test Your Calf Endurance

6. Calf Endurance-Can you do 20 calf lifts?

If you have calf or dorsiflexor weakness it will affect your running ability and hasten an injury from running.



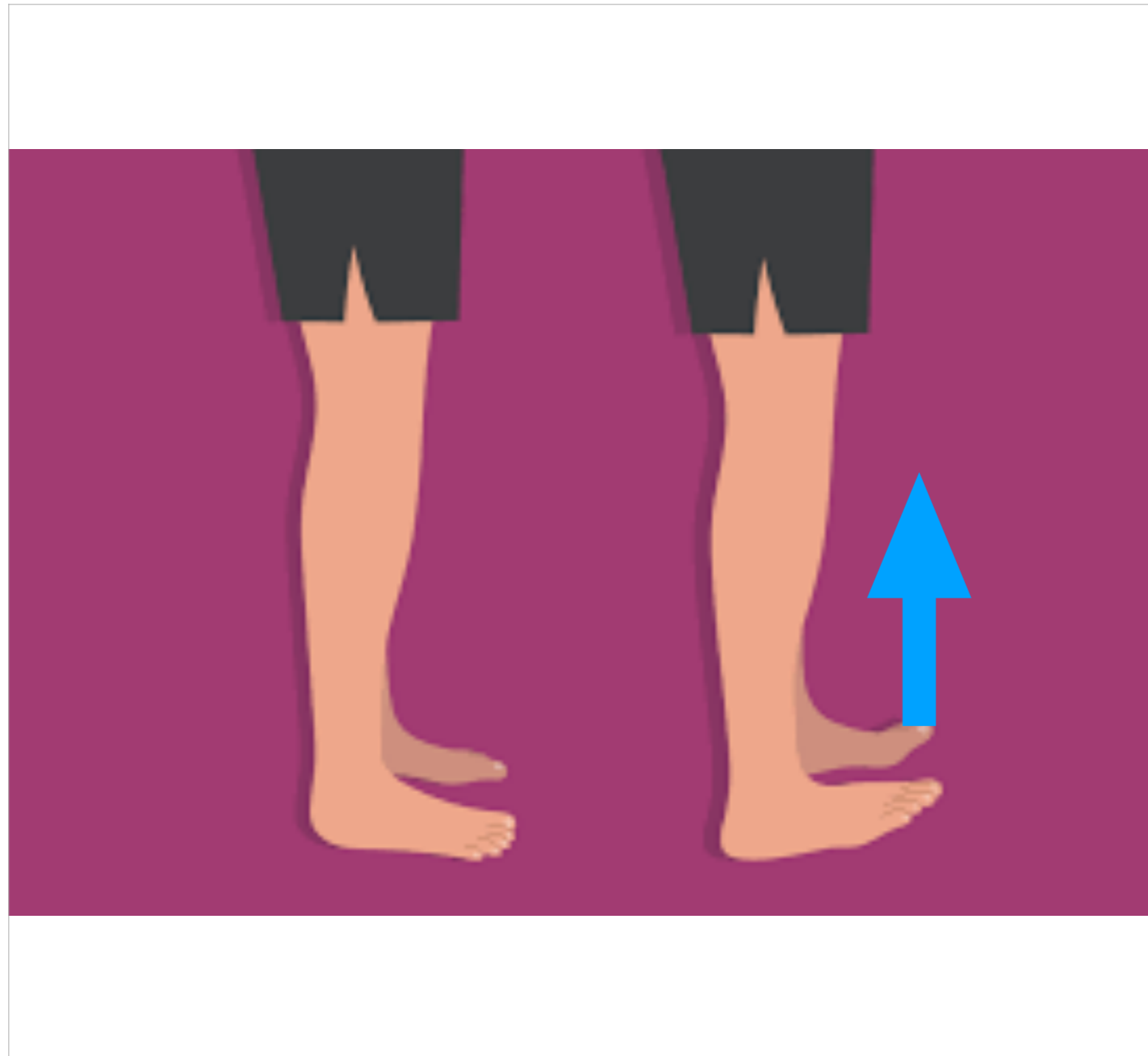
6. Dorsiflexor Endurance-Can you do 20 dorsiflexor toe lifts?

Weakness in the dorsiflexors has been related to shin splints.



These two exercises should be done 2-3 x a week for 1-3 sets for 20 reps. Progress to single leg calf raises.

I can not Overstate the Importance of the Toe Lift for all runners especially Novice Runners.



Self Body Analysis

7. Understand pain

Pain is a sign of dysfunction.

It is a sign that something is wrong.

Working through it will cause more problems and more pain.

Fatigue is not the same as pain.

**When you exercise and you have pain
stop and examine.**

Self Body Analysis

7. Understand pain

Important Point !

The most frequently identified risk factor in running related injuries is a previous injury. Therefore, prevention of this first injury is very important so you should do strength and conditioning to improve performance and prevent injury.

Running Form

Proper running form is essential. There is **no perfect form, everyone looks different**, but certain key features do exist. Understanding them early will avoid picking up bad running habits that can cause injury, frustration, and inefficiency.

Totally Different Running Styles

Johnson versus Bolt

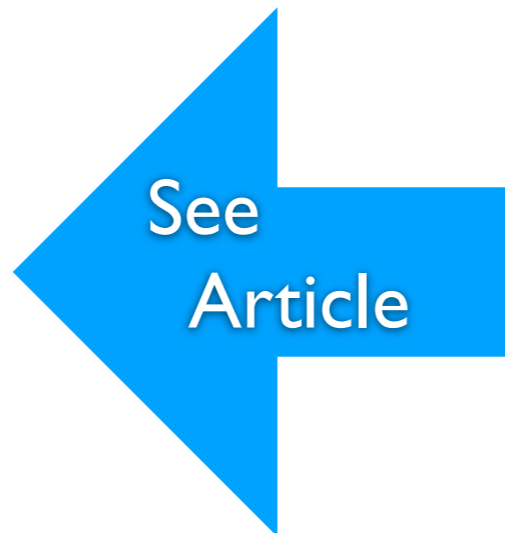
FIND WHAT WORKS FOR YOU, BUT WITH SOME OF THE FOLLOWING CONSIDERATIONS.



According to a landmark Harvard study the key factor associated with injury rates in runners is a simple one: It is the impact force with which the runner's foot strikes the surface on which they are running. Runners who strike with higher force are injured significantly more frequently than runners who strike softly (see article).

**Do Not Bounce
Move Forward
Not Up and Down
When Running**

KEY CONCEPT:
Adopt an impact-absorbing forefoot strike, listen to your steps and try to make them quieter, take shorter strides, and try to move horizontally and limit vertical movement.



NEW SERIES OF JUST DO IT
GREAT ATHLETIC TRAINING EXERCISE SERIES
Do it Right!
Exercises you Should Do
Run soft, limit bounce, and try to glide to prevent running injuries.
Research Support Softer Running for Injury Prevention
When it comes to injury prevention running form matters. I always tell people to run light, in other words land softer. What I mean by that is when you run you should not hear your feet hit the ground to any great degree. I have always suggested this because of running economy improvements and injury avoidance. Research supports my suggestion.
Researchers at [Harvard](#) found that softer landers who land mid foot are better versus stiff leg heel strikers. To understand how they are different jump up and land with stiff legs or with the softer version of allowing ankles, knees, and hips to flex as with soft running. Do you notice the difference. You can really feel and hear the impact with stiff legged landing.
Ways to land softer are to adopt an impact-absorbing forefoot strike, listen to your steps, take shorter strides, and try to move horizontally and limit vertical movement.
Study Found
▪ Runners who strike with greater force, increased vertical impact peaks, and increased vertical load rates have a higher risk for injuries requiring medical attention.
▪ Higher impact forces at landing increased the risk of bony and soft tissue injuries.
▪ Runners who have never been injured had the lowest impact loading of all studied groups.
▪ Vertical average loading rate was the strongest predictor of injury risk.
According to this study, the key factor associated with injury rates in runners is a simple one: It is the impact force with which the runner's foot strikes the surface on which they are running. Runners who strike with higher force are injured significantly more frequently than runners who strike softly.
According to researchers one of the runners studied, a woman who has run multiple marathons and never been hurt, had some of the lowest rates of loading that we've ever seen ([source](#)).
The data also contain a more general message for runners said Harvard: It may be beneficial to consciously think about a soft landing. This can take some time for experienced runners to accomplish, but switching from heel striking to mid foot striking —especially for runners with a long history of injuries—might result in fewer injuries versus heel striking. Another injury prevention strategy to consider is to increase one's cadence. By increasing the number of steps taken per minute, the force of each foot strike can be reduced. Two other factors correlated with high-impact foot striking were running speed and running downhill. Running up hill has been correlated with decreased foot striking forces. They go onto say that gait retraining interventions, such as focusing on transitioning to a forefoot strike pattern, has been previously shown to reduce injuries in runners and should be considered as a treatment for impact-related running injuries
Running economy is a whole other ball game than injury prevention. Research does support the above mentioned limit of vertical oscillation to improve running economy ([research](#)).

KEY CONCEPT: Adopt an impact-absorbing forefoot strike, listen to your steps and try to make them quieter, take shorter strides, and

try to move horizontally and limit vertical movement.

Fitness

Walking Form

Fitness walking is planned, brisk, mindful, purposeful walking at speeds much above your normal walking pace. Learning to fitness walk will make you healthier, more functional, have less pain, and if you are looking to run, a better runner. There is **no perfect form, everyone looks different**, but certain key features do exist. Understanding them early will avoid picking up bad habits that can cause injury, frustration, and inefficiency. **Runners: Use fitness walking between intervals when you run.**

Fitness Walking Foot Strike

Hips are not under hips when fitness walking.



Forefoot

Mid-foot

**Rear Foot
Heel**

What I
recommend

Unlike running where there are different foot strikes most researchers suggest "Heel to Toe" Step forward landing squarely on the heel of your foot (some say outer aspect). Roll forward onto the ball of the foot. Raise the heel and push off with your big toe.

Fitness Walking Form and Foot Strike

Impact Toward the Heel

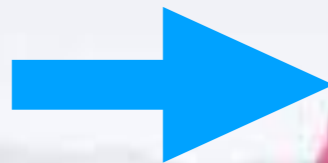
Make Sure the Lead Leg Knee is Bent SLIGHTLY



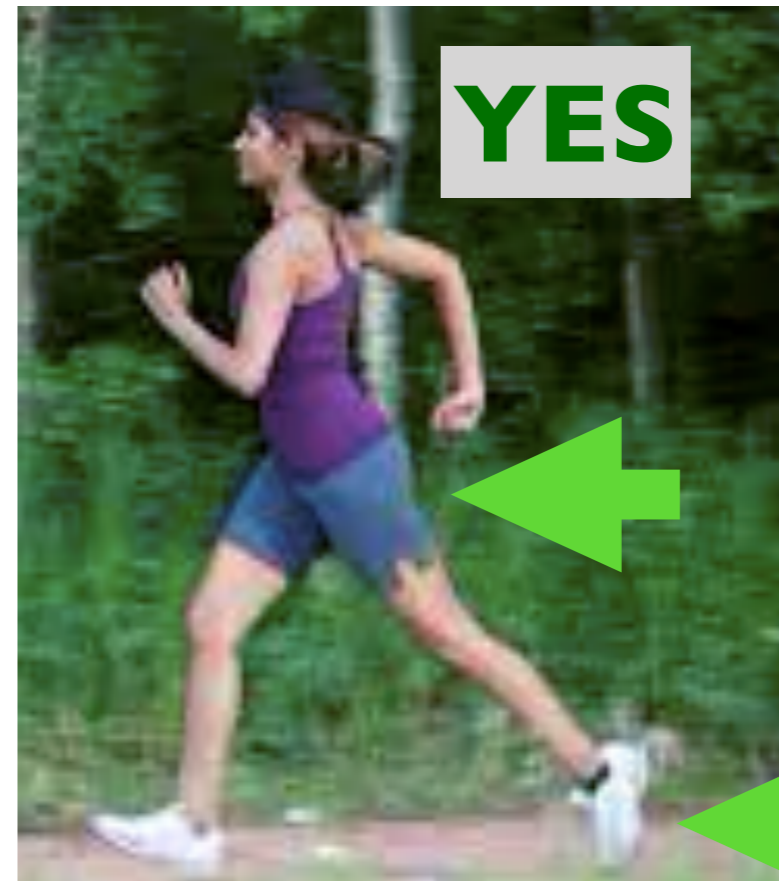
Knee is Straight

NO

Greater Impact Force



**NO FORWARD LEAN OF TORSO
LESS TOE OFF**



YES

Knee is Slightly Bent

Less Impact Forces

More Elastic Energy

**SLIGHT FORWARD LEAN OF TORSO
ALLOWS GREATER HIP EXTENSION
AND TOE OFF**

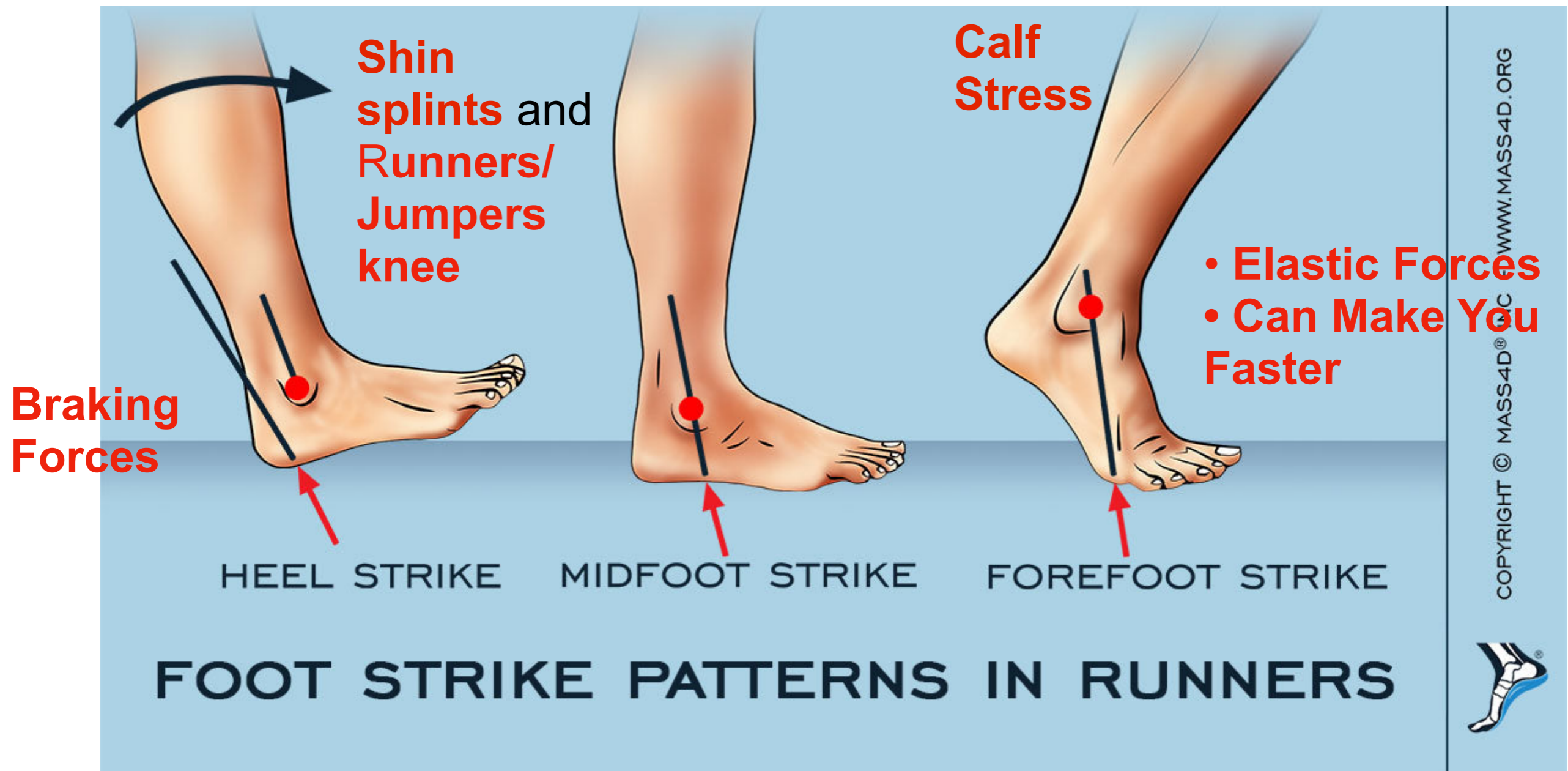
POWERFUL ARM MOVEMENTS

Fitness Walking Form Basics

- It is extremely important that lead leg contacts ground with slightly Bent Knee

Visualize that you are gliding.

- Lead leg should be out in front contacting with heel
 - Move Horizontal NOT Vertical (up and down)
- Slight Forward Lean of Upper Torso Allows Greater Hip Extension
- Strong Push Off all the way down from hips to toes!
Triple Extension
Glutes and Hamstring=Hip Extension
Quadriceps=Knee Extension
Calf=Plantar flexion
- Knee Lift just high enough to get foot in front unless sprinting
- Long and Strong Arm Movements from Shoulders with Elbows Straight - think that you are Cross Country Skiing and using your arms
- Keep shoulder blades retracted and Head Up Looking Ahead
 - Breathe through nose and out mouth if you can



FIND THE STRIKE PATTERN THAT IS THE SOFTEST

Strike Pattern is highly Debatable - Pros and Cons with Each

Forefoot strikers use more joint movement through the ankle, with far less movement through the knee and hip. Heel strikers use less ankle motion, with far more motion through the knee and hip. Different or changing foot strikes don't change load, they simply shift it elsewhere. The same can be said of injuries.

Land with feet under hips is key when running.

Mid-foot/Forefoot

What I recommend, but not for everyone.



Running Foot Strike

Forefoot

Mid-foot

Rear Foot
Heel

Essentially, the best foot placement is the one that feels right to you. Simple answer, but it's true.

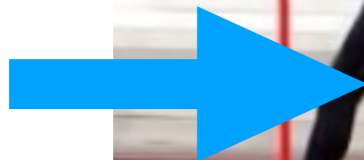
There's a lot of information out there about running form, but coaches generally agree that there is no single solution for all runners.

Running Foot Strike

Center of Mass over Foot Strike Less Impact
Make Sure the Lead Leg Knee is Bent

Greater
Impact/
Braking
Force

Knee is
Straight



Heel Strike



MidFoot

Knee is
Bent



Running Foot Strike

Can Get Away with Heel Strike if Knee is Bent

Heel Strike

Knee is
Straight
Greater
Impact



Heel Strike
Knee is
Bent
Less
Impact

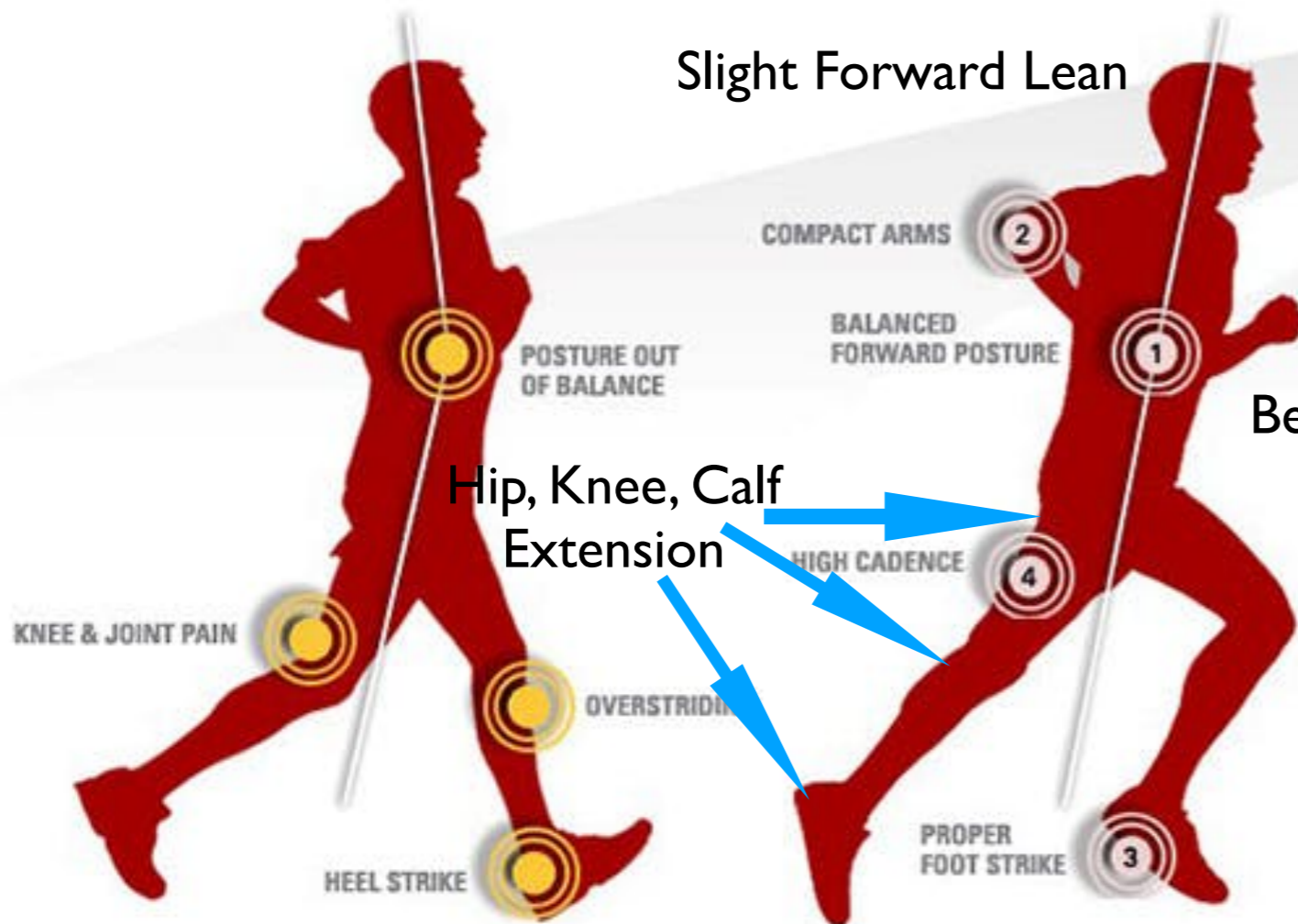
Running Form

NO

YES

FAMILIAR RUNNING FORM

GOOD RUNNING FORM



1

BALANCED FORWARD POSTURE

- Stand tall, gaze forward
- Keep chest forward and shoulders back and relaxed
- Don't bend at the waist

Looking Ahead, Breathe through nose and out mouth

2

COMPACT ARMS

- Short, compact, relaxed arm movement
- Pump back and recover forward, don't sway side to side
- Elbows should not extend in front of the waist unless sprinting

Bent Arms, Not Straight

3

PROPER FOOT STRIKE

- Land softly underneath a bent knee
- Avoid overstriding and excessive heel striking

4

HIGH CADENCE

- Maintain approximately 170-180 steps per minute
- Count 30 steps per leg in 20 seconds for a 180 cadence
- Light, soft & quick foot placement

Soft Landing

Triple Extension

Glutes, Hamstrings, Quadriceps, Calf

SUGGESTED FORM

Your most efficient foot plant is one in which your foot lands directly under your hips or your center of gravity. You may land on the ball of your foot or flat footed, **BUT WITH KNEE BENT**. The ideal landing position is slightly toward the outside edge of your foot, just behind your little toe, between the heel and mid foot. Your foot should then naturally roll slightly inward and forward bringing you to the point you are pushing off your big toe. The slight inward roll of your foot is called pronation and provides some cushioning during the running stride (too much is called overpronation). As you roll onto your toes, try to spring off the ground. You should feel your calf muscles propelling you forward on each step. **Your feet should not slap loudly as they hit the ground. Good running is springy and quiet. REMEMBER TO DRIVE FROM THE GLUTES CREATING TRIPLE EXTENSION AT THE HIPS, KNEE, AND FOOT.**



SUGGESTED FORM CONTINUED

- Glide

You should feel like you are gliding when you run. A good cue is to run thinking you have a bean bag on your head; efficient running would allow the **bean bag** to stay put. Another good cue is to listen to your feet as they make contact; **it should be quick and light.**

- Knee lift

Your knee lift should not be too high unless you are sprinting to the finish. It should be enough to get your leg underneath for the next stride.

*In a proper stride, your foot should land directly under your body with every step; these steps should be **even.** Concentrate on running with a **quick and light stride.** As your foot strikes the ground, your knee should be **slightly flexed** so that it can bend naturally on impact. If your lower leg (below the knee) extends out in front of your body, your stride is too long. As always remember your Glutes and Triple EXT.*

Upper Body During Running

- It should be relaxed with a slight **forward lean**.
- Balanced over the lower torso.
- Eyes forward, looking straight ahead, not down at your feet, and scan the horizon. **A bent neck (looking at the ground) can lead to a host of both neck and low back problems.**
- Arms should be bent and moving freely in an even fashion. **Straight arms on long runs lead to problems with swelling, tingling, and numbness of the fingers or hands.** Too much motion can be wasted energy. Avoid excessive pumping motion. **Good runners move with little wasted energy.** The arms should not go above the chest. Forward arm movement should be minimal (prevents over striding), while backward arm swing should be more forceful. Arm swing should be compact with elbows at about a 90 degree angle.
- Hands should be loose, **not clenched** with very little tension in shoulders.

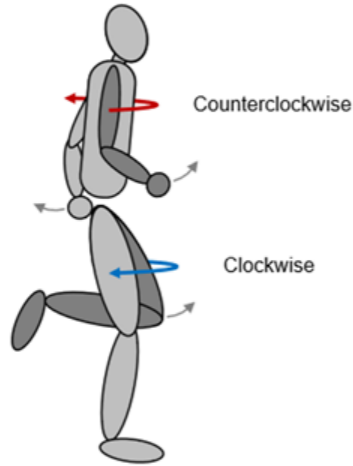
Keep your body as relaxed as possible. Tense muscles will slow you down and force you to work harder. Concentrate on keeping your shoulders, jaw, torso and legs nice and loose.

Running Form Basics

- It is extremely important to Land Soft with Bent Knee (think you have a bean bag on head). Visualize that you are gliding.
 - Land with Feet close to under Hips
 - Move Horizontal NOT Vertical (up and down)
- Slight Forward Lean of Upper Torso Allows Greater Hip Extension
 - Strong Push Off
 - Triple Extension
Glutes and Hamstring=Hip Extension
Quadriceps=Knee Extension
Calf=Plantar flexion
- Knee Lift just high enough to get foot in front unless sprinting
 - Strong Arm Movements from Shoulders with Elbows at 90 degrees
- Keep shoulder blades retracted and Head Up Looking Ahead
 - Breathe through nose and out mouth if you can
 - Running Cadence 160-180 Foot Strikes
- Keep RPE at 3 Moderate to 4 (Somewhat Hard) and > 8 METS.

Arm Swing is Important in Walking in Running

* Counter balances the Momentum of the Lower Legs



Research: Arm Swing Matters

Running: Running with a normal arm swing burn less energy than with no arm swing (3% less than the behind-the-back form, 9% less than across-the-chest, and 13% less than hands-on-head). It also significantly reduced shoulder and pelvis rotation.

Sprinting: Track athletes averaged 4.55 seconds with their arms, and 4.63 without. The team-sport athletes averaged 5.01 and 5.08 seconds. Overall, the difference was 1.6 percent, which may matters in some spots.

* Controls Pace

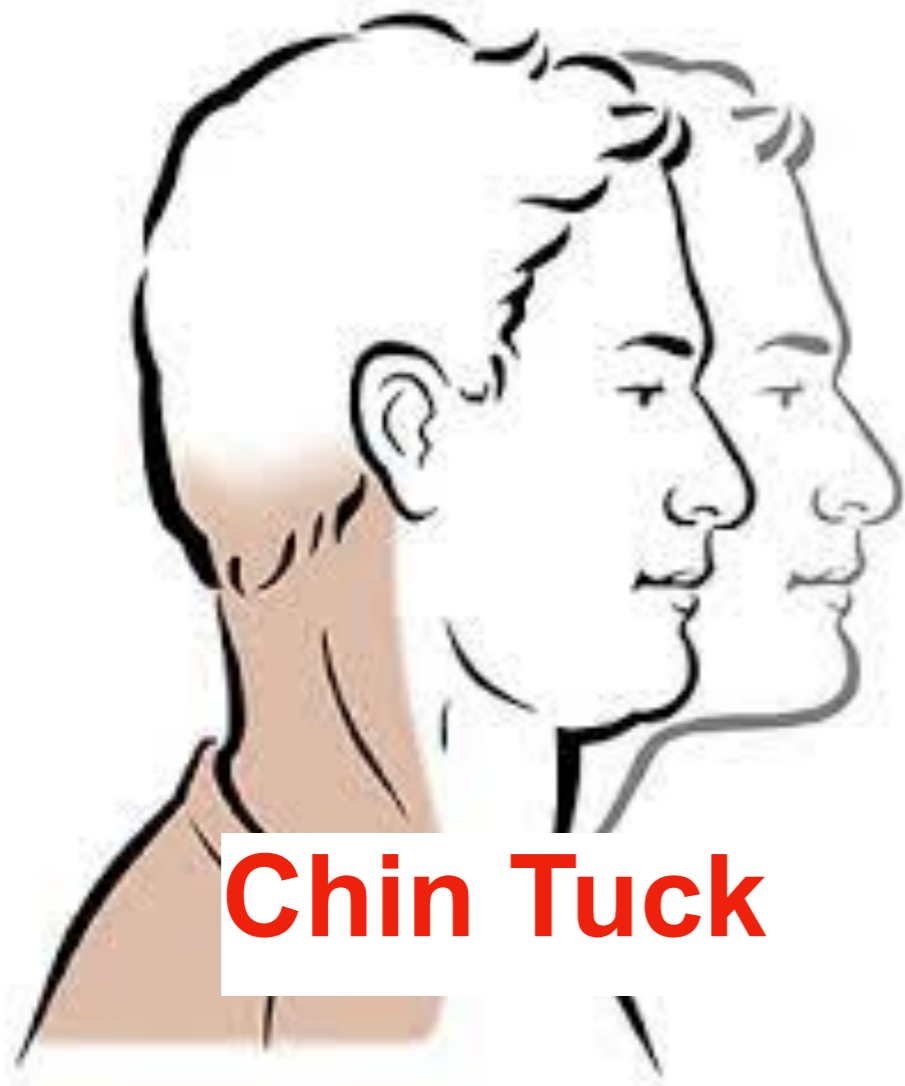
Walking and Running with a relaxed arm swing allows for improved balance and rhythm, which encourages proper running form. Swinging arms counterbalance the momentum of a person's legs, providing stability to the runner. In other words the arms provide a dampening mechanism for the rotation of the torso as we run.

Proper arm swing and 5 ways to improve it

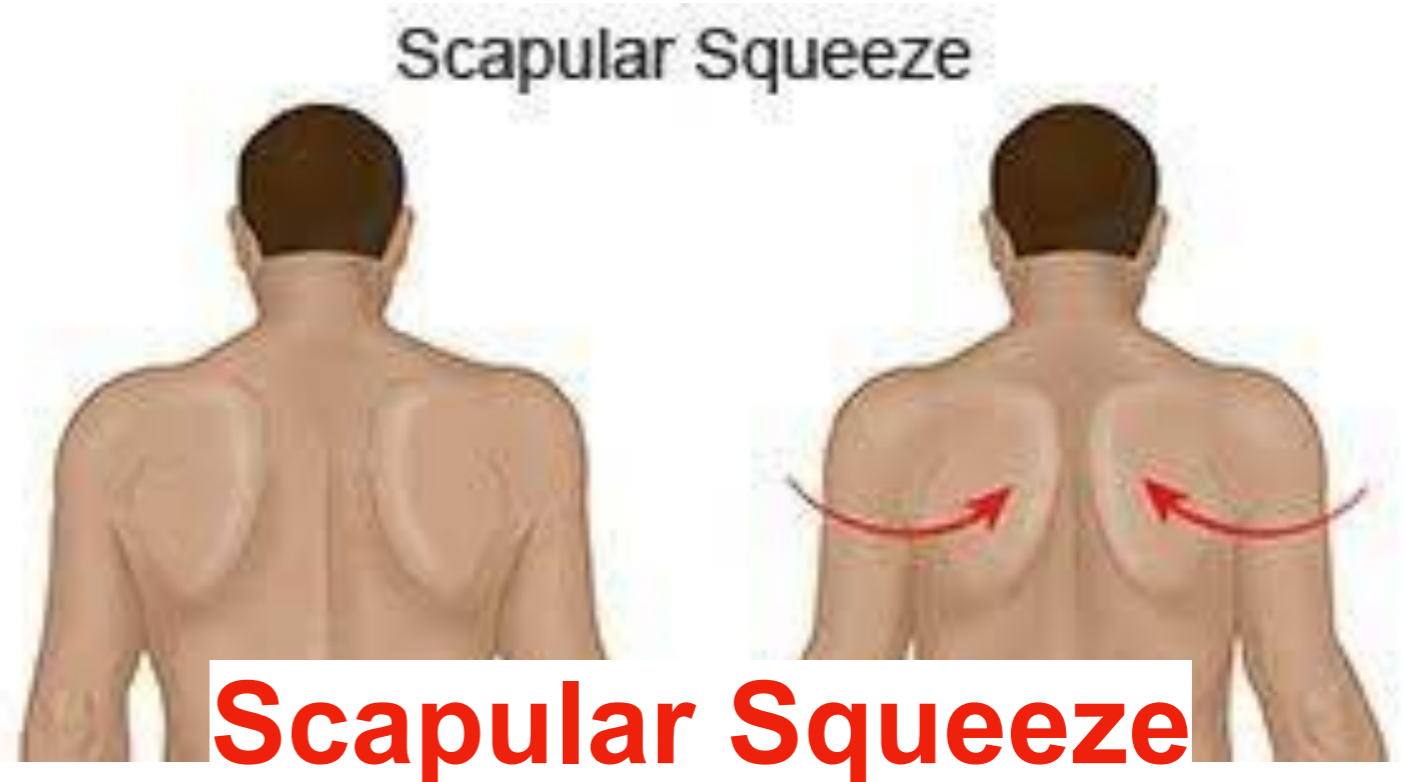
1. Keep your arms at a 90 degree angle and longer with fitness walking
2. Don't let your arms swing across your body.
3. Swing your arms backwards, not outwards.
4. Swing your arms from your shoulders, not your elbows.
5. Relax your hands.

Form Basics - Posture and Breathing

Mindful Posture Even When Running



Chin Tuck



Scapular Squeeze

Scapular Squeeze

Helps Breathing and Less Tension- A bent neck (looking at the ground) can lead to a host of both neck and low back problems.

Mindful Nose Breathing

Try to breath mindfully, deeply, steadily, and through your nose and out your mouth when you are exercising.

A study by [Colorado State University](#) proved this when testing the effectiveness of nasal breathing on 10 runners, over a six-month period. Their findings showed that during nasal breathing their respiratory rate, and breaths per minute decreased, while their intake of oxygen and outtake of carbon dioxide in the bloodstream increased.

Nose breathing is more beneficial than mouth breathing. Breathing through your nose can help filter out dust and allergens, boost your oxygen uptake, and humidify the air you breathe in. Mouth breathing, on the other hand, can dry out your mouth. This may increase your risk of bad breath and gum inflammation. Nasal breathing, as opposed to mouth breathing, has another important advantage, especially for effective and efficient exercise: It can allow for more oxygen to get to active tissues. That is because breathing through the nose releases nitric oxide, which is necessary to increase carbon dioxide (CO₂) in the blood, which, in turn, is what releases oxygen. Mouth breathing does not effectively release nitric oxide, which means the cells are not getting as much oxygen as through nasal breathing, which could lead to fatigue and stress. Nasal breathing also activates the part of the nervous system that supports rest, recovery and digestion, rather than the part of the nervous system that is responsible for survival or stress states, such as flight or freeze. That means that, even if the body is in a stressful state of high-intensity exercise, nasal breathing can provide a sense of calm and allow us to function better.

Breathe

[SEE MY ARTICLES](#)

[DO YOU BREATHE RIGHT WHEN YOU EXERCISE](#)

[DO YOU HOLD YOUR BREATH WHEN YOU LIFT](#)

[DO YOU BREATHE WITH YOUR BELLY OR CHEST](#)

5K Program Suggestions

Program Suggestions

In several studies it is shown that running more than 64 km per week increases the risk of Running Related Injuries (RRIs).

**Keep Running Under 20 Miles Per Week, Fitness Walkers can Exceed That
But I would not double that mileage**

Running too many times per week and running only once a week increases the risk of RRIs.

**Take 1-3 Days off per week and do Fitness Walking, Exercise Machine, or Just
Rest**

Do Not Run Just One Day Per Week

It has been shown that running on a hard surface increases the risk of injuries and it is therefore advised to perform the majority of the training sessions on a soft surface.

Try To Run on Soft Surfaces (Grass or Track)

There still is debate about the use of stretching for injury prevention. However, one thing is clear: occasional stretching increases the risk of RRIs. Therefore, I suggest to stretch at every training session or not at all.

If You Stretch Stretch, If You Do Not Do Not Start Unless Suggested Otherwise

Do Fitness Waking Every Chance You Get Such As During Recovery Intervals

Perform Strength and Conditioning Exercises 2 Days Per Week

Fitness Walking Program Suggestions

Fitness Walking: Commit to 3-5 Days per Week of Interval Fitness Walking for 30 minutes.

After a 5 minute Walk Warm Up build into a Vigorous Fitness Walk at a Pace you can **talk or sing** for as many minutes as you can do comfortably, do not push yourself. Recover with a Slower Fitness Walk, but still use good technique and move faster than a normal walk. When you feel ready to start over repeat Vigorous Fitness Walking until you need another rest and then repeat. Keep doing this for 30 minutes unless you need a rest. **Do this for no more than 30 minutes. I would suggest 15 to 20 minutes of High Intensity Interval Training initially if you are new to exercise.** Commit to additional days of fitness walking that is less vigorous on your recovery days. The total days walking is 6 to 7 days a week with 3-5 of them being Interval Training. After 4 weeks extend total time fitness walking up to 45 minutes, but keep interval training to no more than 30 minutes.

Running Program Suggestions

Commit to 3-5 Days per Week of Interval Run Training (HIIT) for 30 minutes.

After a 5 minute Walk Warm Up build into to Run at a Pace you can **talk or sing at** for as many minutes as you can do comfortably, do not push yourself (see RPE chart next page) then recover with a Vigorous Fitness Walk. When you feel ready to start over by repeating to run until you need another rest. Keep doing this cycle for 30 minutes. For the first 2 weeks keep running to no more than 10 minutes. ***Make**

Note of Your Intervals

Progression Suggestions. Always revert back to previous weeks suggestion if progression is too much!

Weeks 1-2 Running for Total of 10 minutes out of the 30 minutes

Weeks 3-4 Running for Total of 10-15 minutes out of the 30 minutes or repeat above

Weeks 5-6 Running for Total of 15-20 minutes out of the 30 minutes or repeat above

Weeks 7-8 Running for Total of 20-25 minutes out of the 30 minutes or repeat above

Weeks 9-10 Running for Total of 25-30 minutes or repeat above

STOP IF YOU HAVE PAIN, DO NOT PUSH IT

Commit to Fitness Walking Up to 7 Days per Week: Do when recovering between bouts of runs during High Intensity Interval RUN Training (HIIT) and on Recovery Days. I suggest Fitness Walking most days per week because it will make you a better runner and help in recovery.

WHAT IS VIGOROUS

Vigorous Starts at a RPE of 4.

**Keep High Intensity Intervals
at 4 to 5**

Vigorous activities may cause the heart to beat faster, sweating, muscle burn, breathing to become labored, and talking to become difficult. Vigorous activity can be performed with most forms of aerobic activities. One of the best forms of vigorous activities is interval training (some call it High Intensity Interval Training). It is a sequence of 2 or more intervals of high interspersed with low intensity aerobic activity for 30 to 90 seconds (ideal 45 to 60 seconds).

Rated Perceived Exertion (RPE) is a subjective measure of how a person feels during physical activity. It is a great way to judge intensity of an activity. It is a total body observation of heart rate, increased breathing, and muscle fatigue. The **RPE** scale runs from 0 – 10. The numbers in the RPE chart relate to phrases used to rate how easy or difficult you find an activity



Intensity is relative so use the

RPE scale

RPE	Talking	Breathing
1	Normal	Normal
2	Normal	Normal
3 Moderate	Easy	Comfortable
4 VT-1 Somewhat Hard	Somewhat Difficult	Noticeable
5-VT2 Hard	Difficult	Deep but Steady
6-VT2	Difficult-Very Difficult- Lactic Acid Burn	Deep and Somewhat Rapid
7-VT3	Very Difficult	Deep and Rapid
8-VT3	Extremely Difficult	Very Deep and Very Rapid
9	No	Very Deep and Very Rapid
10	Impossible	Breathlessness

Traditional Couch to 5K Running Program

Weekly Schedule (9 Week Program)

Week 1

Brisk five-minute warmup walk. Then alternate 60 seconds of Running and 90 seconds of walking for a total of 20 minutes.

Week 2

Brisk five-minute warmup walk. Then alternate 90 seconds of Running and two minutes of walking for a total of 20 minutes.

Week 3

Brisk five-minute warmup walk, then do two repetitions of the following:

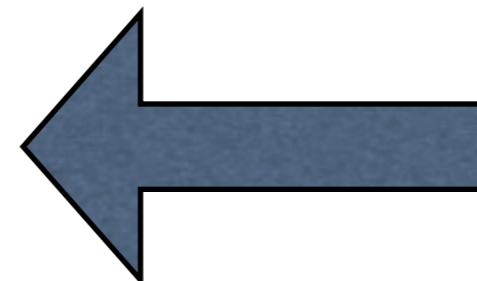
- Run 200 yards (or 90 seconds)
- Walk 200 yards (or 90 seconds)
- Run 400 yards (or 3 minutes)
- Walk 400 yards (or three minutes)

Week 4

Brisk five-minute warmup walk, then:

- Run 1/4 mile (or 3 minutes)
- Walk 1/8 mile (or 90 seconds)
- Run 1/2 mile (or 5 minutes)
- Walk 1/4 mile (or 2-1/2 minutes)
- Run 1/4 mile (or 3 minutes)
- Walk 1/8 mile (or 90 seconds)
- Run 1/2 mile (or 5 minutes)

**Gets much harder.
May need to repeat
previous week.**



Continued

Week 5

Brisk five-minute warmup walk, then:

- Run 1/2 mile (or 5 minutes)
- Walk 1/4 mile (or 3 minutes)
- Run 1/2 mile (or 5 minutes)
- Walk 1/4 mile (or 3 minutes)
- Run 1/2 mile (or 5 minutes)

Week 6

Brisk five-minute warmup walk, then:

- Run 1 mile (or 10 minutes)
- Walk 1/4 mile (or 3 minutes)
- Run 1 mile (or 10 minutes)

Week 7

Brisk five-minute warmup walk, then Run 2.5 miles (or 25 minutes).

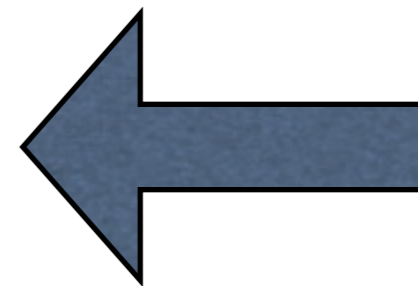
Week 8

Brisk five-minute warmup walk, then Run 2.75 miles (or 28 minutes).

Week 9

Brisk five-minute warmup walk, then Run 3 miles (or 30 minutes).

**Gets much harder.
May need to repeat
previous week.**



5K Program

Do Muscular

Conditioning based on

the various tests

mentioned. See why

next page and Sample

Strength Program and

Core Programs.

KEY: To prevent injury and improve performance you need to strengthen your muscle. Running alone will not achieve the same results (see article for more details).

NEW SERIES OF JUST DO IT
GREAT ATHLETIC TRAINING EXERCISE SERIES

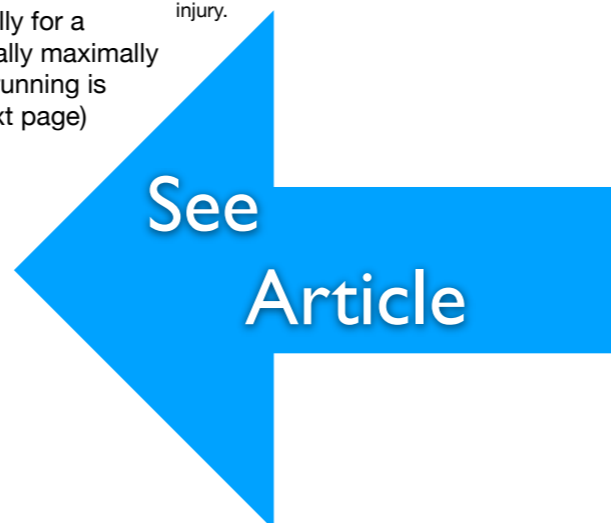
Do it Right!
Exercises you Should Do

Some People think they do not need to strengthen their legs because they run. That is wrong. Many of the forthcoming exercises in this series are leg strengthening exercises. To prevent injury and improve performance you need to strengthen the muscle. Running alone will not achieve the same results. The amount of muscle growth that you can achieve from just a standard running program is limited. It may occur to a fair degree in novice and older runners. High Intensity Interval Training (HIIT) running and cycling has been shown to increase muscle mass similar to strength training, but they too have limits when it comes to muscle growth. When doing aerobic exercise solely you only strengthen some muscle through limited range of motions. **Considering this I would suggest strength training that works a variety of lower body muscle groups through multiple motions to build tissue capacity in order to improve performance and prevent injury.**

Many of my runners just want to run. I get it. Yes, if you are new to running it may strengthen the lower body to a point, but strength gains are limited where some muscles may get stronger to a point, while other muscles not utilized while running or worked through a limited motion may not. The other issues is that when you run the forces placed on the muscle is for many short instances (fractions of a second), which may not be enough stress/load on the muscle to strengthen it and to cause significant muscle growth. Typically to strengthen a muscle the tissue is under load for several seconds for multiple repetitions to almost failure. So even though the muscle is only worked while strength training for 30 to 90 seconds (10 to 15 repetitions at a 2 second to 3 count with each repetition), a much shorter time than running, it is overloaded maximally for a longer sequence. In other words when strength training the muscle is typically maximally overloaded to volitional exhaustion with each set, while the muscle during running is exposed to high and fast amounts of low level stress. (See more details next page)

As mentioned in previous issue it is very clear that strength training may help in run performance. A 2016 meta-analysis of multiple studies on the impact of strength training on running found a “large beneficial effect” on running economy — the ability to use less oxygen at the same pace — three to four percent less, which is considerable in terms of performance.

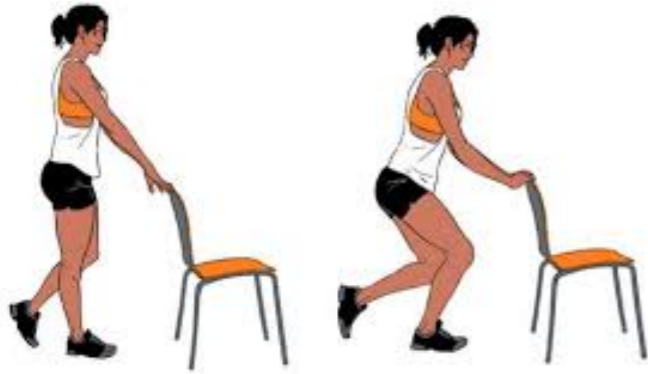
Besides improving running economy strengthening increases muscle and tendon mass which increases their respective capacities, which helps prevent injury.



Strength Training Improves Running Economy. A 2016 meta-analysis of multiple studies on the impact of strength training on running found a “large beneficial effect” on running economy — the ability to use less oxygen at the same pace — three to four percent less, which is considerable in terms of performance.

Easy Strength Training Exercises Anywhere

2 X PER WEEK **1-3 sets 10-15 reps**



SINGLE LEG SQUATS SUPPORTED

Keep Hips Level
Keep Knee Lined up with Second Toe



STEP UPS SUPPORTED

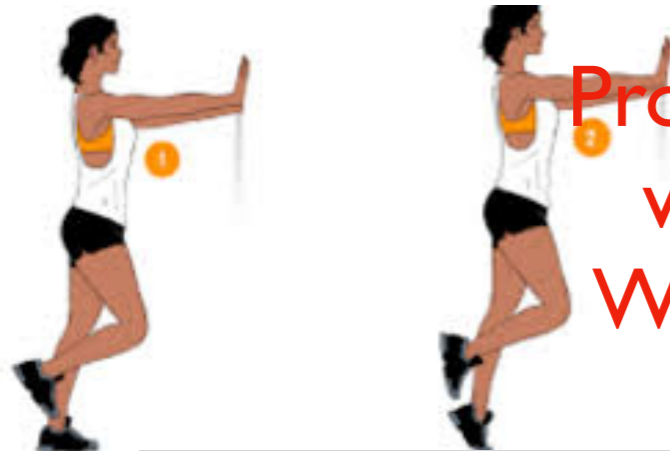


Standing Hip Flexion (SLR)



Standing Hip Extension

Progress with Band



CALF RAISES SUPPORTED

Progress with Weight



TOE LIFTS



BIRD DOG



Engage Lateral Core

Progress with Band

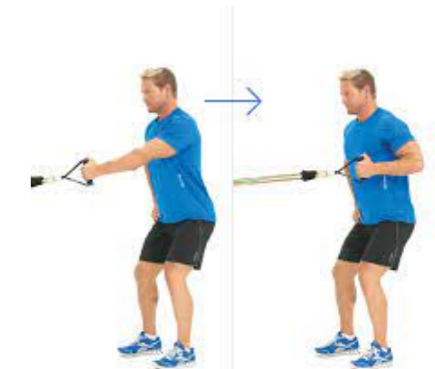
LATERAL LEG LIFT



PUSH UPS



ROW



Race and Fitness Team Page

5k Training Page

BMS 5K Results

Fast BMS 5K Times

Men - 19:23

Women - 23:39

Appendix

See my great article on Nordic Walking.

Nordic Walking

Unlike trekking or hiking poles, which have loose straps that go around your wrists, Nordic poles have a special glove-like system attached to each pole. These poles have you sliding your hand into it where you are using your palm rather than your fingers to transmit power to the poles and move yourself forward. **FORM:** There are several Nordic walking techniques. One is "double poling." It involves planting both poles symmetrically in front of you and pulling yourself forward as you walk a few steps. You then walk a three steps and repeat. The other common one is "single poling," which mimics what your feet are doing, with just one pole in front of you for each stride. Do this either with the same-side arm and leg together or with the opposite arm and leg together. The pole and foot will always be striking and propelling at the same time. **EQUIPMENT:** 70% of your overall height is the recommended length for your Nordic walking poles. The rule of thumb is that your elbow should bend at a 90 degree angle when the pole is perpendicular to the ground (the elbow should be glued to the waist and pole tip touching the ground).



Walking with Nordic poles burns more calories and works more muscles than conventional walking many websites suggest. Nordic walking mimics the motion of cross-country skiing by using poles to push yourself as you walk. It was originally designed as a summer training routine for cross-country skiers. Now Nordic walking is catching on in the United States as an exercise regimen, especially among older adults. The exercise combines muscles in the lower and upper body that regular walking does not, where studies have shown an engagement of 80% to 90% of your muscles, as opposed to 50% with walking, providing a substantial calorie-burning benefit (([research](#), [research 2](#), [research 3](#))). Other studies have shown that Nordic walking burns more calories than regular walking up to 20% ([research](#)). While walking the poles help redistribute weight and can help reduce joint loading and increase muscular strength. This may help reduce the pain that typically comes with prolonged high impact exercise, such as running ([research](#)). You burn more calories but not feel like you are working harder compared to traditional walking ([article](#), [article 2](#)). One study found that office workers who practiced Nordic walking for 12 weeks had greater shoulder mobility and reduced pain in their traps, lats, and infraspinatus ([research](#)). Body composition improvement is superior with Nordic walking compared to conventional walking as seen in a 9-month study including 77 university students which showed an 18% greater reduction in fat mass compared with those in the control group, who engaged in regular exercise based walking program ([research](#)). I am all about joint health and pain-free motion and Nordic walking seems to fit the bill there. One study found that it increases hip range of motion, stride length, and functional fitness in those with osteoarthritis. Furthermore, it was shown to significantly reduce perceived pain compared with home-based exercises ([research](#)).

Why does running make us happy?

September 1, 2015

University of Montreal

Date:

Source:

Summary:

The joy of running. That sense of well-being, freedom and extra energy that runners often experience is not just a matter of endorphins. A new study shows that the "runner's high" phenomenon is also caused by dopamine, an important neurotransmitter for motivation. The joy of running. That sense of well-being, freedom and extra energy that runners often experience is not just a matter of endorphins. A study at the University of Montreal Hospital Research Centre (CRCHUM) shows that the "runner's high" phenomenon is also caused by dopamine, an important neurotransmitter for motivation.

Running reduces risk of death regardless of duration, speed

July 28, 2014

American College of Cardiology

Date:

Source:

Summary:

Running for only a few minutes a day or at slow speeds may significantly reduce a person's risk of death from cardiovascular disease compared to someone who does not run, according to a new study. Running for only a few minutes a day or at slow speeds may significantly reduce a person's risk of death from cardiovascular disease compared to someone who does not run, according to a study published today in the *Journal of the American College of Cardiology*. Compared with non-runners, the runners had a 30 percent lower risk of death from all causes and a 45 percent lower risk of death from heart disease or stroke. Runners on average lived three years longer compared to non-runners. Also, to reduce mortality risk at a population level from a public health perspective, the authors concluded that promoting running is as important as preventing smoking, obesity or hypertension. The benefits were the same no matter how long, far, frequently or fast participants reported running. Benefits were also the same regardless of sex, age, body mass index, health conditions, smoking status or alcohol use. Journal Reference:

1. Duck-chul Lee, Russell R. Pate, Carl J. Lavie, Xuemei Sui, Timothy S. Church, Steven N. Blair. **Leisure-Time Running Reduces All-Cause and Cardiovascular Mortality Risk.** *Journal of the American College of Cardiology*, 2014; 64 (5): 472 DOI: [10.1016/j.jacc.2014.04.058](https://doi.org/10.1016/j.jacc.2014.04.058)

Running does not lead to knee osteoarthritis, may protect people from developing disease, experts say

November 16, 2014

American College of Rheumatology (ACR)

Date:

Source:

Summary:

Running as a habitual exercise at any stage in life not only does not increase a person's risk of developing knee osteoarthritis and may even help protect a person from developing the painful disease, according to new research findings. American College of Rheumatology (ACR). "Running does not lead to knee osteoarthritis, may protect people from developing disease, experts say." ScienceDaily. ScienceDaily, 16 November 2014. <www.sciencedaily.com/releases/2014/11/141116094058.htm>.

Despite transition period, maximal running shoes may still increase risk of injury

April 16, 2019

Oregon State University

Date:

Source:

Summary:

A six-week transition period did not help wearers adjust to "maximal" running shoes, indicating that increased impact forces and loading rates caused by the shoe design do not change over time.

Carbs, not fats, boost half-marathon race performance

December 15, 2015

American Physiological Society (APS)

Date:

Source:

Summary:

Recent studies have proposed that burning fat instead of carbohydrates will improve exercise performance because the body's fat reserve is much larger than its carbohydrates reserve. A new study reports the opposite, finding that muscles rely on carbohydrates as their fuel source during prolonged exercise.

Running may be better than walking for breast cancer survival, research finds

January 29, 2014

DOE/Lawrence Berkeley National Laboratory

Date:

Source:

Summary:

Previous studies have shown that breast cancer survivors who meet the current exercise recommendations (2.5 hours of moderate intensity physical activity per week) are at 25 percent lower risk for dying from breast cancer. New research suggests that exceeding the recommendations may provide greater protection, and that running may be better than walking.

Stretching before a run does not necessarily prevent injury, study finds

February 20, 2011

American Academy of Orthopaedic Surgeons

Date:

Source:

Summary:

Stretching before a run neither prevents nor causes injury, according to a new study. However, runners who typically stretch as part of their pre-run routine and were randomized not to stretch during the study period were far more likely to have an injury.

Humans run at the most energy-efficient speed, regardless of distance

April 28, 2022

Cell Press

Date:

Source:

Summary:

As race season approaches, many runners have the same goal: go faster. But researchers now show that speeding up might require defying our natural biology. By combining data from runners monitored in a lab along with 37,000 runs recorded on wearable fitness trackers, scientists have found that humans' natural tendency is to run at a speed that conserves caloric loss -- something that racers seeking to shave time off their miles will have to overcome.

Running research: Heel-toe or toe-heel?

December 12, 2019

La Trobe University

Date:

Source:

Summary:

New research suggests there is no evidence that changing a runner's strike pattern will help prevent injuries or give them a speed boost. "Our comprehensive review suggests that telling someone to run on the ball of their foot instead of their heel may make them less efficient, at least in the short term. Additionally, there is no evidence either way on whether running on the balls of your feet reduces injury." Dr Barton said switching your running style shifts the body's loads but doesn't make them disappear. "Running toe-heel might help injuries at the knee, where loads are reduced. However, it may cause injuries to the feet and ankle, where loads are increased," Dr Barton said. "Put simply, when it comes to running style: If it ain't broke, don't fix it."

Running actually lowers inflammation in knee joints

Running may also slow the process that leads to osteoarthritis

December 9, 2016

Brigham Young University

Date:

Source:

Summary:

We all know that running causes a bit of inflammation and soreness, and that's just the price you pay for cardiovascular health. You know; no pain, no gain. Well, maybe not. New research from exercise science professors finds that pro-inflammatory molecules actually go down in the knee joint after running.

Boost in nerve-growth protein helps explain why running supports brain health

Date:

May 16, 2022

Source:

NYU Langone Health / NYU Grossman School of Medicine

Summary:

Exercise increases levels of a chemical involved in brain cell growth, which bolsters the release of the 'feel good' hormone dopamine, a new study shows. Dopamine is known to play a key role in movement, motivation, and learning. Experts have long understood that regular running raises dopamine activity in the brain and may protect nerve cells from damage. In addition, past research has tied exercise-driven boosts in the dopamine-triggering chemical called brain-derived neurotrophic factor (BDNF) and in dopamine levels to improvements in learning and memory. However, the precise way these three factors interact has until now remained unclear.

Building Strong Bones: Running May Provide More Benefits Than Resistance Training, Study Finds

Date:

March 9, 2009

Source:

University of Missouri

Summary:

Osteoporosis affects more than 200 million people worldwide and is a serious public health concern, according to the National Osteoporosis Foundation. Resistance training often is recommended to increase and prevent loss of bone mineral density, although previous studies that examined the effects of resistance training in men produced varied results.

Arm movement and running speed: Is the partnership overrated?

Date:

April 20, 2022

Source:

Southern Methodist University

Summary:

New research into human speed suggests that athletes who performed short sprints with their arms closed across their chests were nearly as fast as when they sprinted with their normal arm swing.

Any amount of running linked to significantly lower risk of early death

Substantial improvements in population health/longevity likely if more people took it up, say researchers

Date:

November 4, 2019

Source:

BMJ

Summary:

Any amount of running is linked to a significantly lower risk of death from any cause, finds a pooled analysis of the available evidence.

Previously unknown aspects of running shoe design uncovered

January 26, 2022

University at Buffalo

A thick running shoe midsole is often favored for its shock absorbing protection, but it has been assumed that these heavily cushioned shoes increase leg stiffness and muscle fatigue. But results of a new study suggest that midsole thickness is unlikely to cause individuals to alter their leg stiffness. "You can have that cushioning if you like it and still run with normal natural leg stiffness," he says.

Date:

Source:

Summary:

Mathematics to improve running

May 15, 2014

CNRS (Délégation Paris Michel-Ange)

How can runners improve their performance, weight and fitness? Researchers have produced a mathematical model to optimize running, which could lead to personal e-coaching customized to each individual's physiological state. It also confirms a well-known fact in the sports community: runners who vary their speed spend their energy better and thus run longer. Mathematics gives them the opportunity to switch from simple statistical tools to personalized sporting advice.

Date:

Source:

Summary:

Barefoot running: How humans ran comfortably and safely before the invention of shoes

February 1, 2010

Harvard University

Scientists have found that those who run barefoot, or in minimal footwear, tend to avoid "heel-striking," and instead land on the ball of the foot or the middle of the foot. In so doing, these runners use the architecture of the foot and leg and some clever Newtonian physics to avoid hurtful and potentially damaging impacts, equivalent to two to three times body weight, that shod heel-strikers repeatedly experience.

Date:

Source:

Summary:

How to combine 'leg day' with running

April 26, 2019

James Cook University

Scientists say they have the solution for a problem gym-goers have when they combine endurance and weight training. "One of the easiest recommendations to follow is that if the performance of resistance and endurance training sessions on the same day is unavoidable, endurance training sessions should be done prior to resistance training irrespective of the intensity of either, with at least half a day of recovery in-between training sessions,"

Date:

Source:

Summary:

Expensive Trainer Running Shoes Are A Waste Of Money, Study Finds

October 11, 2007

BMJ-British Medical Journal

Expensive trainer running shoes are not worth the money, finds a small study published in the British Journal of Sports Medicine. Cheap and moderately priced running shoes are just as good, if not better, in terms of cushioning impact and overall comfort, it concludes.

Date:

Source:

Summary:

Running shoes may cause damage to knees, hips and ankles, new study suggests

January 6, 2010

Elsevier Health Sciences

Running, although it has proven cardiovascular and other health benefits, can increase stresses on the joints of the leg. In a new study, researchers compared the effects on knee, hip and ankle joint motions of running barefoot versus running in modern running shoes. They concluded that running shoes exerted more stress on these joints compared to running barefoot or walking in high-heeled shoes.

Date:

Source:

Summary:

Want to turn back time? Try running a marathon

New marathon runners reduced blood pressure, arterial stiffness equivalent to a 4-year reduction in vascular age

January 7, 2020

American College of Cardiology

The new year means it's time to set resolutions for 2020 and new research suggests running a marathon for the first time could have several health benefits. The study found that for first-time marathon runners, training and completion of the marathon was associated with reductions in blood pressure and aortic stiffening in healthy participants that were equivalent to a four-year reduction in vascular age.

Date:

Source:

Summary:

Why people choose running over walking

January 6, 2012

North Carolina State University

Other than Olympic race walkers, people generally find it more comfortable to run than walk when they start moving at around two meters per second – about 4.5 miles per hour. Biomedical engineers have discovered why: At two meters per second, running makes better use of an important calf muscle than walking, and therefore is a much more efficient use of the muscle's – and the body's – energy.

Date:

Source:

Summary:

Jogging keeps you young: Seniors who run regularly can walk as efficiently as 20-somethings

November 20, 2014

Humboldt State University

Date:

Source:

Summary:

A new study is shedding light on an unexpected benefit of jogging in older adults. The study looked at adults over the age of 65 -- some of whom walk for exercise and some who run for exercise. The researchers found that those who run at least 30 minutes, three times a week were less likely to experience age-related physical decline in walking efficiency than those who simply walked.

Scientists explode the myth about running injuries

June 14, 2013

Aarhus University

Date:

Source:

Summary:

Ordinary running shoes function perfectly well for new runners regardless of how they pronate, according to new research. Healthy newcomers to running who overpronate/underpronate do not actually suffer more running injuries than other runners if their first pair of running shoes do not have any special support.

Three key results

In the *British Journal of Sports Medicine*, the researchers point to three key results:

- The study contradicts the current assumption that over/underpronation in the foot leads to an increased risk of running injury if you run in a neutral pair of running shoes.
- The study shows that the risk of injury was the same for runners after the first 250 km, irrespective of their pronation type.
- The study shows that the number of injuries per 1,000 km of running was significantly lower among runners who over/underpronate than among those with neutral foot pronation.\

Give barefoot running the boot?

May 30, 2013

Taylor & Francis

Date:

Source:

Summary:

Barefoot running has been making headlines ever since 1960, when a shoeless Abebe Bikila set a new world-record marathon time at the Rome Olympics. Even manufacturers have muscled in on the trend over the years, with most now offering their own version of 'barefoot' or 'minimalist' shoes.

Foot positioning during walking and running may influence ankle sprains

July 1, 2011

University of Georgia

Date:

Source:

Summary:

The position of the foot just before ground contact during running and walking may put people at risk for ankle sprains, according to a new study.

Compression tights don't help runners reach finish line, study reveals

June 1, 2017

Ohio State University Wexner Medical Center

Date:

Source:

Summary:

Despite the fact that distance runners swear by them, a new study finds compression tights don't help runners go farther or faster.

When to end a run to avoid injury: Runners change form when running exhausted

December 11, 2010

Indiana University

Date:

Source:

Summary:

Runners and scientists for years have pondered when runners should end a run in order to avoid injuries. A new study by a physical therapy professor sheds light on this with findings that runners unknowingly change their running form when they run while exhausted. The change in mechanics could be related to an increased risk for injuries.

Stronger hips improved running mechanics, lessened knee pain, research finds

June 7, 2011

Indiana University

Date:

Source:

Summary:

Hip strengthening exercises performed by female runners not only significantly reduced patellofemoral pain -- a common knee pain experienced by runners -- but they also improved the runners' gaits, according to a motion analysis expert.

Minimalist shoes increase leg and foot muscles

October 3, 2016

Hong Kong Polytechnic University

Date:

Source:

Summary:

Running in minimalist shoes can increase leg and foot muscle volume.

Running upright: The minuscule movements that keep us from falling

New study finds the human body constantly corrects to stay on its feet

March 28, 2019

Ohio State University

Maybe running comes easy, each stride pleasant and light. Maybe it comes hard, each step a slog to the finish. Either way, the human body is constantly calibrating, making microscopic adjustments to keep us from falling as we weekend-warrior our way to greatness.

Date:

Source:

Summary:

Running a marathon hard on heart, especially in less prepared runners

October 9, 2013

Elsevier Health Sciences

Investigators who studied a group of recreational marathon runners have established that strenuous exercise, such as running a marathon, can damage the heart muscle. Although they found the effect is temporary and reversible, they warn that these effects are more widespread in less fit distance runners and that recreational distance runners should prepare properly before marathons.

Date:

Source:

Summary:

Human gait adapted for efficient walking at the cost of efficient running

February 12, 2010

University of Utah

Humans, other great apes and bears are among the few animals that step first on the heel when walking, and then roll onto the ball of the foot and toes. Now, a new study shows the advantage: Compared with heel-first walking, it takes 53 percent more energy to walk on the balls of your feet, and 83 percent more energy to walk on your toes.

Date:

Source:

Summary:

Hips take walking in stride, ankles put best foot forward in run

May 25, 2011

North Carolina State University

In a first-of-its-kind study comparing human walking and running motions -- and whether the hips, knees or ankles are the most important power sources for these motions -- researchers show that the hips generate more of the power when people walk, but the ankles generate more of the power when humans run. Knees provide approximately one-fifth or less of walking or running power.

Date:

Source:

Summary:

Marathon running may cause short-term kidney injury

March 28, 2017

Date:

5K Training

Fitness Walking /Running

*Get Ready for the Spring 5K at
Rogers Field Devens*



- Prepare with the 5K Support Group
- Get Coached and Supported to Fitness Walk / Run Your Best 5K

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of the Team