

Evidence-Based Running Class

The purpose of this class is not to completely change how you run but rather to OPTIMIZE how you run, helping you become a more efficient runner. By learning how to use your pain as a guide you will know what running technique(s) to employ that will decrease your pain while you run. This takes practice but is very plausible!

The main skill you will learn is how to run with a slightly quicker step frequency (the number of steps you take while running per minute). There growing research that increasing your step frequency by 5-10% decreases the amount of impact that goes up your body and also decreases IT band strain at the hip and knee. Increasing stride frequency also works well regardless of your foot (arch) type, footstrike, and height.

The goal of optimizing your running form and learning how to run with a higher step frequency is to PREVENT your pain from increasing while running. However, understand that many people will still feel pain, especially when you first begin working on this. It typically takes people 3-4 classes to learn how to begin changing their pain while running and another 2-4 classes to become really good at running pain-free or with minimal pain. That is the benefit of this class! Instead of feeling pain and stopping, let your pain guide you to improve how you run so that you can run pain-free or as minimally painful as possible.

Dynamic Warm-Up – Pick 5-8 of these and do them for 5-10 minutes to warm up and get your heart rate up

Instructions for the warm-up: *“Hop as soft and quietly as possible”* and *“Land with your ankles and knees slightly flexed to absorb the impact”*

- 1) Double Leg Hopping x 1 min (simulating jumping rope, landing as softly & quietly as possible)
- 2) Walking Knees to Chest (pulling one knee to your chest each step and alternating) OR Walking Hip Circles
- 3) Crisscross Double Leg Hopping x 1 min OR Toes in & out Hopping x 1 min
- 4) Walking Single Leg Romanian Deadlifts x 20
- 5) Double Leg Heel Raises x 20-30 reps
- 6) Walking Lunges x 20 OR Toy Soldier walks x 20
- 7) Pulling Drill with Double-Single Leg Hops x 30 sec on each
- 8) Walking Leg Swings Anterior-Posterior x 20 OR Lateral Squats x 20
- 9) Half-Jack Hopping x 1 min
- 10) High Knees x 20
- 11) Double Leg Body-Twist Hopping x 1 min OR Single Leg Hops x 10 reps on each leg and alternate 3 times (30 total)
- 12) Butt Kicks x 20
- 13) Carioca
- 14) Power Skips (A-Skips)
- 15) B-Skips

Pulling Drills

Instructions for Pulling Drills: *“Pulling helps you get the shorter, quicker strides that decrease the impact forces on your legs each step you take. Land as softly and quietly as possible while doing these drills.”*

- 1) Foot Tapping Drill x 1 min (30 sec on each leg) (Hop on both legs every other time, on the “other” time pull the leg to knee-level and then put it back down. You’ll hop on both feet, one foot, etc.)
- 2) Pulling in Place x 1 min (Like running in place, instruct the class to simulate running in place but emphasize pulling their foot up as in the foot tapping drill. Practice pulling in place to a metronome set at 90 beats / min. Practice swinging the arms with the elbows flexed to 90 degrees as you will when running.)
- 3) Pulling in Place into Run, emphasizing the pulling
- 4) Backwards running (Emphasizing pulling the leg as you run backwards)

Leaning Drills ~2-3 min

Instructions for Leaning Drills: *“Running with a slight forward lean, about 10 degrees, with your trunk upright is an important aspect of efficient running form and helps achieve shorter, quicker strides.”*

- 1) Heel-Toe Rocks x 1-2 min (Stand “soft in the knees” [i.e. knees slightly flexed ~20 deg] slowly rocking your body weight from your heels to the forefoot and back. Try to find your front and back limits to where if you went one degree farther you would lose your balance.)

- 2) Double Leg Wall Falls x 10-15 reps (*Stand arms-length away from a wall, facing the wall. Stand upright with your knees slightly flexed (~20 deg) and do Heel-Toe Rocks back and forth 2-3 times before slowly leaning forward past your front base of support and catch yourself with your hands.*)
- 3) Heel-Toe Rocks into Running with pulling x 3-4 times down and back

Sound Retraining ~5-10 min

Download a free (Decibel X, NIOSH Sound Level Meter, Sound Meter Pro) or cheap noise meter app. Run on a treadmill at a consistent, comfortable running speed that you can easily maintain. Run for a few minutes or until you feel warmed up and then turn on the noise meter app and see what your sound level is. Then work on using the pulling and landing softer cues to run quieter, getting the sound meter to decrease. Run as quietly as possible for 1-2 minutes and then slow down the treadmill and walk for 1-2 minutes. Repeat this cycle 3-5 times and as you become better at running quietly and it feels more natural continue running farther.

Metronome Running ~5-10 min

Download a free metronome app. If you know your normal step frequency (how many steps per minute you take while running), take that number x 1.1 to get the desired 10% increase in step frequency.

Set the metronome to half of the number you calculated above. Why half? It's much easier to focus on one foot hitting the ground on the beep rather than both feet. Keeping up with the metronome at 180 bpm is difficult but keeping one foot on cadence at 90 bpm is easier. If you're unsure of your step frequency set the metronome to 90 beats per minute as that is the average 10% increased stride rate for most people (if you're over 6' go with 85, if you're under 5'5" go with 95). Every time the metronome beeps the same foot should hit the ground. It will be silent when the other leg beeps.

Practice running for 1 minute at a time with the metronome beeping, doing your best to keep the same foot striking the ground on every beep. Count how many steps in a row you can take on the beep. Over time try to stay on the beep for the entire minute. If you notice yourself slowly getting off the beep speed up by taking quicker steps to get back on the beep. Run 1 minute then walk 1 minute and take a break. Repeat this run-walk progression for a total of 10-30 minutes.

Tips for Running...

Listen to your pain as you run. If you feel your pain begin to build focus on shortening your stride and landing softer.

Pay attention to what part of your foot strikes the ground first. (heel, forefoot, or you land flat-footed) Try to land as softly as possible on your heel so that you feel smooth as you roll forward to your forefoot and push-off to take the next step.

Treadmills are great ways to get back into running. The impact is slightly lower than running outside and you can set a constant speed. Setting the constant speed is useful with the metronome running.

If you're not running much because of pain or fitness, practice running first and then do an incline walk workout on a treadmill. Set the incline to > 10 degrees (or as high as it will go) and the speed at 3.5 mph. This workout has been found to be cardiorespiratory-wise equal to running but impact-wise, equal to walking. So, run and then do 10-15 minutes of incline walking to boost your fitness, build your lower body and cardiorespiratory endurance, and burn more calories by boosting your metabolism.

Do a back, core, hips, lower body strengthening circuit 2-3 times per week. Do 3-4 rounds of 4 exercises with the bands around your knees. Focus on quality and good form over more reps.

Shoes – most runners do best in a neutral shoe, regardless of your arch/foot-type. The most important factors in selecting a shoe are comfort and fit. To see if the shoe is a good fit, stand in your socks on the floor at the store and balance on one leg for 30 seconds. Then put on the shoes you are considering, tie them, and repeat the 30 seconds of single leg balance on each leg. It should be immediately obvious to you that it's easier to balance with the shoe on than barefoot. If it's not obvious it's not the right shoe. Repeat this with a single leg squat. If both your single leg balance and squat are better in the shoe and it's comfortable, that's a great shoe for you! Walk around for a couple minutes, the shoe should feel great. Shoes do not need to be broken in. Ensure the shoe size is big enough that you can fit one horizontal thumb-width between your big toe and the end of the inside of the shoe.

If you feel pain while running it should go away within 30-60 minutes after you're done running. If not, you overdid it a little. If you wake up the next morning and your pain is still higher from running, then you definitely over-did it. Take 1-2 days off and run again, doing about 50-75% of the distance you ran the previous time. If you wake up the next morning and only feel a workout type of soreness and not pain, you are good to continue progressing your running as your fitness and form allows.

Strengthening Circuit for Running

Pick 3-4 of the following strength exercises and do them as a circuit 2-3 times per week. I recommend doing this on days you're not running.

- Each exercise should take ~1 minute to complete. Follow the order in which they are and immediately move onto the next exercise when you complete one.
- At the end of each round take a 1-2 minute break
- Begin with 3 rounds of the circuit and increase to 4-5 rounds if desired.

Single Leg Pistol Squats



- Stand with your heels ~6" in front of the wall and lift one leg.
- Next, focus on "hinging" your hips back to the wall while keeping your back slightly arched as you lower yourself until your buttocks touch the wall.
- Focus on keeping your knee tracking straight forward over your toes and not side-to-side
- *Don't let your knee go too far in front of your toes

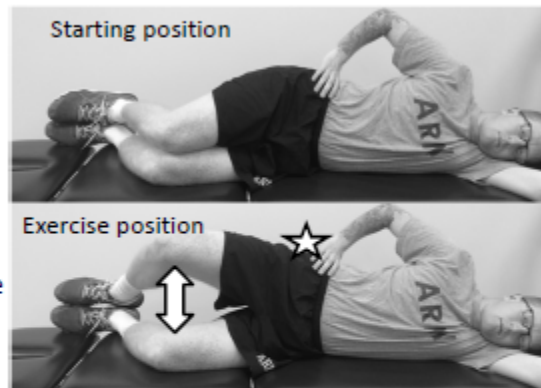
Begin with 4-5 sets of 5 reps and progress to 3 x 12-15 reps as able

Hip Strengthening: Clamshells

- Lie on your side with your knees bent ~90 deg and your heels together
- Your feet, buttocks & back should be in a straight line
- Squeeze the muscles on the side of your hip (star) so that your knee lifts up as shown
- DON'T "rotate" your hips back
- You should feel the muscles on the side of your hip working

Do 3 sets of 15-20 reps

If this exercise becomes easy when performed as above, start doing them with a t-band around your knees as shown below.



Heavy Slow Resistance (HSR) Heel Raises off a Stair

Do these 3 days of the week.

Each rep is SLOW and should take 3-4 sec up and 3-4 sec back down.

Move in a steady, controlled manner – not fast – to load the tendon and calf and induce healing through the principle of "time under tension".

- Begin with Double Leg (DL) Heel Raises
 - Do 3 sets of 15-20 reps
 - When you can do 3x20 reps easily, progress to SL heel raises
- Single Leg (SL) Heel Raises
 - Do 3x10-15 reps on each leg

Stretch your calves after each set of heel raises x 30 sec on each leg off a stair



Standing Hip Abduction

- Standing Hip Abduction
 - Balance on 1 leg (the other leg is the leg exercising)
 - If you can't balance, stand next to a wall or table to hold onto
 - Squeeze the muscles on the side of your hip (star) that you're lifting out to the side
 - Keep your toes pointed straight ahead
 - You should also feel this exercise in the hip muscles on the leg that you're standing on – Focus on keeping your pelvis as level as possible and NOT leaning to the side
 - As this becomes easier, scoot the band further down your leg towards your ankles for more resistance

Do 3 sets of 8-15 reps on both legs

Exercise position



Starting position



Goblet Squat

- Starting position
 - Feet wider than shoulder width apart
 - Toes slightly pointed out
 - Slightly “arch” your low back by “lifting up” your buttocks
 - Keep your chest upright with your shoulder blades squeezed together
- Performance
 - Squat down so that your hips move backward as your knees move forward over your toes (Exercise pic)
- End position
 - Thighs are parallel to the floor
 - Maintain arch in back (Side view)
 - Knees are barely in front of the toes
 - Return to starting position using your glutes and quads

Do 3 sets of 15-20 reps

With band around knees



Starting Position



Side View



Exercise Position

Side Stepping with T-band

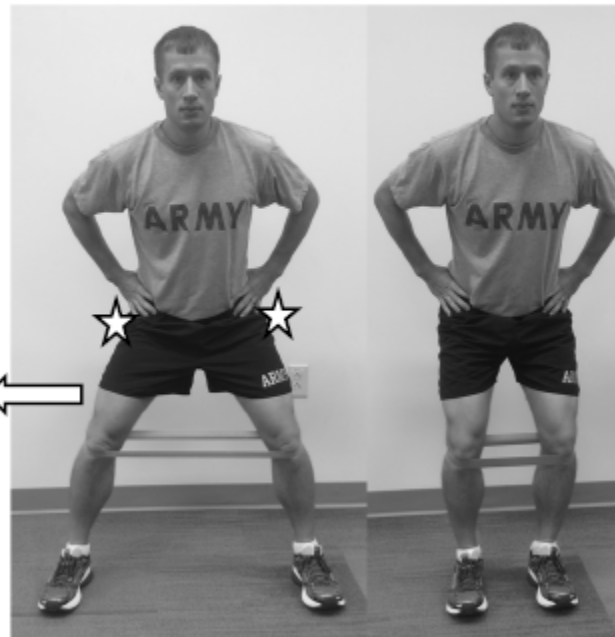
1. Begin standing w/ your feet shoulder width apart w/ a band around your knees (pic on right) in an athletic posture
2. Next, step to side against the resistance of the band. When your other leg follows, go slowly, resisting the bands pull on your leg
3. You should feel the muscles on the sides of both hips working

Do this 2-4 times x 25 ft down & back (facing the same direction)

*To increase the burn, do 1x10 reps of standing hip abductions before each rep of this exercise.

Performing the Side step to the "Right"

Starting Position



Double Leg Hopping

- Double leg hopping
 - Hop "front to back" and "side to side" as depicted in the pictures over a single strip of tape (narrow hopping)
 - *Focus on landing softly and quietly
 - Do 4 bouts of 30 seconds for each direction as fast as you can without losing your balance
 - If this becomes too easy work on jumping higher & quicker
 - In 2 weeks progress to "wide" hopping (hopping across both pieces of tape, ~12 inches or 1 tide width)
 - In 3-4 weeks if this is easy and you have no feelings of instability, begin doing these on 1 leg at a time at 2 bouts of 30 seconds per leg



Front to back hops

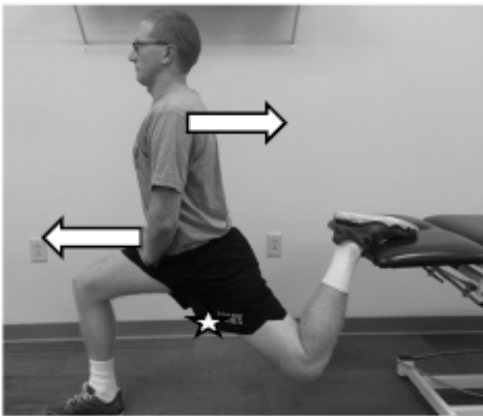


Side to side hops

Stretches after the Circuit & Running

Do each stretch 2-3 times for 20-30 sec holds
after the strength circuit at running

Quad & Hip Flexor Stretches



Prone Quad & Hip flexor stretch





Back & Glute Stretches

Do 2-3 times each for 30-45 seconds ALSO do after each set of back bridges or reverse hypers

- Knees to chest
 - Grabbing your knees, pull them towards your chest. This usually helps relax your back muscles after you perform back strengthening exercises.
- Glute stretch
 - One hand grabs above your ankle and the other grabs your knee.
 - Pull your knee straight back towards your shoulder. You should feel a good stretch in your buttocks.
- Piriformis stretch
 - Using almost the same hand position, this time you use both hands to pull your leg towards your OPPOSITE shoulder. You should feel a good stretch in your buttocks similar to the Single Leg Over stretch.



Importance of Icing your Knee

- Icing your knee is very important to help manage swelling and inflammation due to exercise. It is most beneficial to ice immediately after exercise(s) that causes pain to increase after you stop.
- The 2 most common “overuse” knee conditions are patellar tendonitis and fat pad impingement syndrome – both are inflammatory.
- The best way to ice your knee is with a bag of frozen peas, placing them directly over your skin on the front of the knee and wrapping it on tight for 30 minutes (20 is ok if you’re short on time). Do this 2-3 times in the evening followed by some quad and hip flexor stretches.
- If you ice with a chemical cold freezer pack (blue pack) you have to put a pillow case or other thin barrier between the cold pack and your skin to prevent frostbite. Check to make sure it isn’t changing the color of your skin, if so stop!



Walk to Run Progression

See FM7-22: CH 6 for walk to run progression or as prescribed by medical provider. Alternate between walking and jogging for the prescribed time and repetitions.

Week	Walk	Jog	Repetitions	Total Time
1	4 minutes	1-2 minutes	5 times	30 minutes
2	3 minutes	2-3 minutes	5 times	30 minutes
3	2 minutes	3-4 minutes	5 times	30 minutes
4	1 minute	5 minutes	5 times	30 minutes

Run every other day, with the goal of reaching 30 consecutive minutes over the next 4 weeks. Expect some pain or discomfort after running.

Icing your knee after running (best method is real ice in a plastic bag, directly over the skin on the front of your knee joint for 20 minutes) effectively helps reduce the pain and inflammation that is due to exercising while you're healing.

Push yourself, but be smart about it; some days may be worse than others. Don't be afraid to cut the workout short if you need to do more of the hip and knee strengthening exercises or stretches and take the next day from running and then try to run again on the second day.