

## Key Concepts:

- **Improper training techniques** (e.g. too many miles, too much intensity, rapid change in training terrain, not enough rest, etc.) can negate even the most comprehensive exercise routine.
- Exercises will help with **strength, stability, power, and mobility...** Why are these important? They enable a more efficient gait pattern, minimize load on tissues, **reduce risk of injury, and improve performance - running speed!!**
- Strengthening ideally should be completed 2-3 days/week.  
**A LITTLE IS BETTER THAN NONE!**
- Maintaining proper alignment is very important (hip, knee, toes in alignment). Don't let the knees go beyond or inside the toes.  
**Eccentric** control is very important (SLOWLY LOWERING DOWN).
- Every runner will have different needs. **FOCUS ON YOUR SPECIFIC AREAS THAT ARE MOST CHALLENGING.** Seek a physical therapist to develop a specific program for your exact needs, or if you are experiencing pain with any exercise.
- If you are unable to achieve the "**Goals**" specified below, it may indicate an area that needs attention.



# STRENGTH

The below exercises can help find weaknesses, and provide progressions to address those areas of need. If you are new to strength training, it may be beneficial to start by completing **12-15 reps, with less resistance**, focusing on form and proper activation of the desired muscle groups. \*Ultimately, in order to maximize strength gains, you should fatigue the desired muscle group in **8-10 reps and complete 2-3 sets**. If you are able to do more reps, with good form and with ease, you may need more resistance or it's time to progress the exercise.\*

## Hip and Core Control: RDL/Hip Hinge:



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\*\* Keep three points of contact with the stick throughout exercise- head, mid-back, sacrum. Stance knee is soft, not locked. Hips stay facing forward (don't twist). \*\*

**Goal:** x10 reps, slow and controlled, maintaining alignment. Easier: Go less deep. Allow light fingertip support for balance. Reach down to touch a chair or stairs for balance.

**Harder:** Go lower. Reach with your hand (opposite side you are standing on), but still keep your spine straight. Add a weight in that same hand.

## Lateral Hip Strength: Side Plank:



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\*\* Lie on side, supported on forearm and outside of foot/ankle. Don't let hips/body roll forward or back. Then lift top leg off of bottom foot and hold.

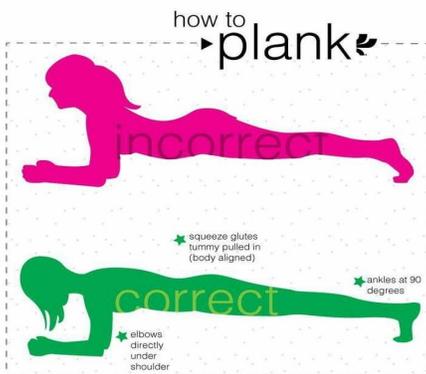
Do not let hips sag - keep the body in a straight line.\*\*

**Goal:** x10 leg lifts or 15-30 second holds.

**Easier:** Keep feet together, or bottom knee down. Work on lifting up and down from the floor (not holding).

**Harder:** Longer holds; raise top arm up, or add forward/back reach/trunk rotation with top arm/leg.

## Abdominal strength: Front Plank on Forearms:



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\*\*The whole key is maintaining a "pelvic tilt", tailbone tucked - no arch or sag in the low back.\*\*

**Goal:** 60 second plank with both feet down,

**Harder:** Alternate throughout the minute 3-5 seconds with one foot lifted (just an inch) for basic running, 10-15 second one-leg holds for distance running.

**Alternative:** Dead Bug variation: \*\*Lie on back with legs up at 90 degrees of hip and knee bend (as if sitting in a chair). Lower one leg slowly out and down, while keeping low back pressed down into the ground.\*\* **Goal:** Get one leg out straight and down to the floor, without low back lifting off of the ground. Other leg still at 90/90 start position.

**Quad Strength, Leg Alignment: One Leg Sit to Stand:**



**One leg Sit to Stand:**

\*\* Sit in a standard height chair, up at the front edge of the chair, with feet pulled back slightly under you, foot flat on floor. Raise one leg, then try to stand up using just your other leg. \*\*

**Goal:** 10x reps Rise and lower, slow and controlled, no use of momentum. Do not let the knee move inward - stays in line with toe.

**Easier:** Higher chair height (or add pillows). Or try a one leg mini squat standing, or side step off edge of a short step.

**Harder:** Add repetitions, go slow, keep the trunk more upright, add weight.

**Hip Extension Strength: Unilateral Bridge:**



**Unilateral Bridge:**

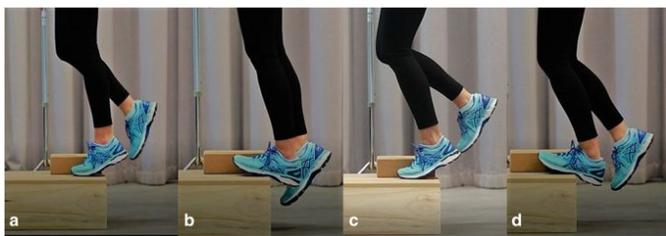
\*\* Perform a one leg bridge/hip lift. Avoid arching your back, but trying to get up to a full height bridge as pictured. \*\*

**Goal:** Full height with strong gluteal contraction, no back pain or arch, 10 repetitions

**Easier:** Two leg versions, or one leg without knee hold.

**Harder:** Perform with heel elevated on chair or physioball.

**Calf strength: Single Limb Heel Lift:**



**Calf strength: Single Limb Heel Lift:**

\*\*Using fingertip support for balance, perform one-leg heel raises until fatigued. Slow up & down.\*\* PERFORM A SET WITH KNEE STRAIGHT, AND WITH KNEE BENT.

**Goal:** More than 20 reps (30 reps for distance runners) through full height, able to perform off 1-2" step.

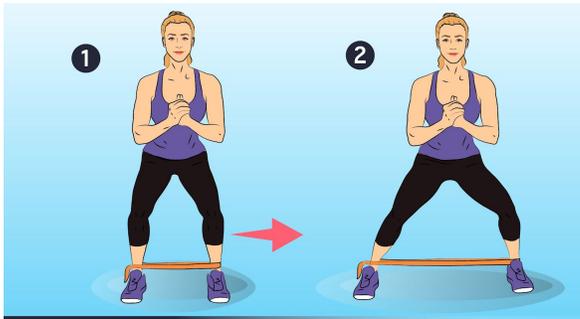
**Easier:** use other foot or hands for slight assist.

**Harder:** Add weight to fatigue at 8-10 reps

# STABILITY

Control Dynamic Alignment of the Leg and Pelvis When Under Load or Fatigue

## Lateral Band Shuffle:



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\*\*Focus on Maintaining tension in the band, with stable/upright trunk, and short choppy steps. Should feel fatigue in the lateral hips/glutes. Complete 3 sets to complete muscle fatigue with each set.

## Single Leg Squat/Hip Hinge with Lateral Band Kicks:



## Single Leg Squat/Hip Hinge with Lateral Band Kicks:

\*\*Focus on upright trunk and good alignment of the hip/knee/ankle. Try to keep a cadence of 160-180 kicks/minute with the band to simulate running.\*\*  
**Goal:** 30 seconds maintaining good upright posture, slight knee bend, and 160-180 kicks/minute for cadence.  
**Harder:** Complete the same as prescribed above but complete 10x small single leg squats or hip hinges to better simulate running form.

## POWER/PLYOMETRICS

Helps to simulate quick muscle contractions and impact/shock absorption required while running. If you have not been strength training, I would recommend starting with the slow, controlled strengthening exercises **for 4-6 weeks prior to initiating power/plyometrics** to avoid overloading the tissues.

### Alternating Toe Taps On Step:



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\*\*Should be completed at a cadence of 160-180 taps/minute. Heels should not touch the floor or very GENTLY if they do.\*\*

**Goal:** 3 sets of 30 seconds

### Jump Rope:



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\*\*Should be completed at a cadence of 160-180 taps/minute. Heels should not touch the floor or very GENTLY if they do.\*\*

**Goal:** 3 sets of 30 seconds

**Harder:** Complete with single leg hops (alternate sides) and with multidirectional hops (fwd/back or side/side)

### Drop Jumps:



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\*\*Step off from a step, into a squat, and quickly jump as high as you can.\*\*

**Goal:** 3 sets of 10

Make sure to maintain alignment, avoiding letting knee "cave in" on landings.

# MOBILITY/FLEXIBILITY

These exercises provide a basic test for general mobility in areas that may require attention for running. Generally, you should complete static stretches for 2-3x30 seconds, better after exercise than before.

## Ankle/Calf flexibility: - Knee to Wall Test:



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\*\* Stand with feet 3 inches away from a wall, hands on wall for support. Push knee forward toward wall (letting knee bend), but do not let heel raise off the ground. \*\*  
**Goal:** Knee to wall without heel lift, with toe three inches or more away from wall.  
NB - this tests the ankle and soleus (lower calf), but not the gastroc (upper calf). Can you achieve a similar ankle angle with a straight knee (to test the upper calf) in a traditional calf stretch position?

## Hip Extension Flexibility: Half Kneeling Stretch:



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\*\* Start by kneeling on one knee (lunge position). Tighten stomach muscles to create a posterior pelvic tilt - tuck tailbone, pull belly button up and in (as if buttoning tight pants). Press hips slightly forward. Hold 30 seconds.\*\*  
**Goal:** hard to self-assess, but you should be able to get hips slightly in front of the knee, without losing the pelvic tilt or arching your back.

## Great Toe Extension Flexibility:



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\*\*Starting in a kneeling position on tiptoe gently pushing the heel backwards and down as the toe is extending. A gentle pull should be felt in the arch of the foot and lower leg.\*\*  
**Goal:** 70 degrees or more great toe extension.  
**Alternative:** Complete with the great toe extended against the wall or towel roll while progressing the knee forward.

