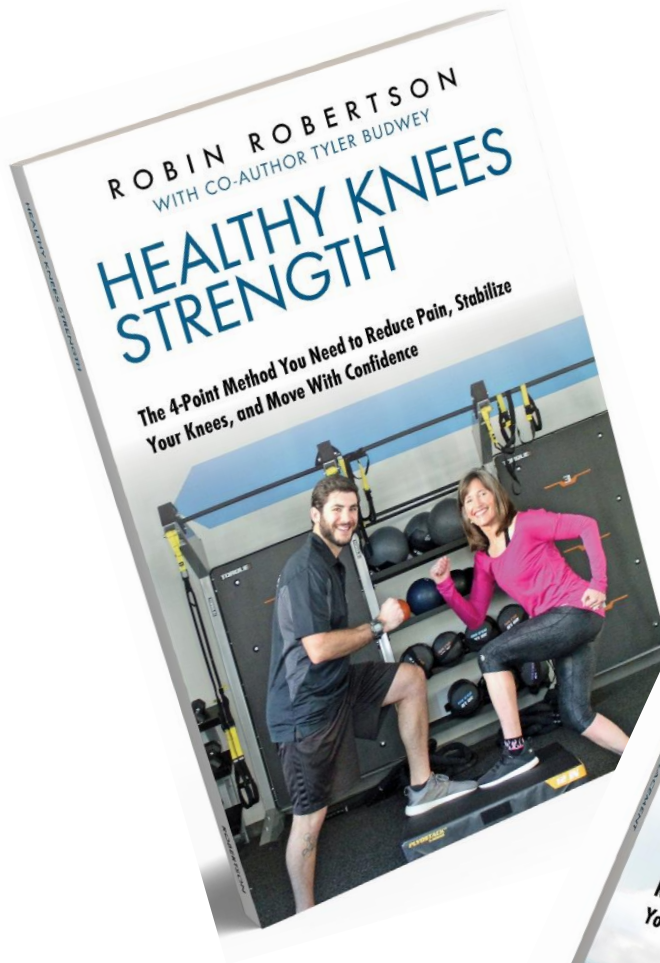




HEALTHY KNEES
COACH

COMPANION STRENGTH GUIDE

For the Healthy Knees Books



Companion Strength Guide to the Healthy Knees Books

Healthy Knees Cycling Healthy Knees Strength Healthy Knees Total Knee Replacement

Hello! I'm so glad you have this guide to help you with proper form for each exercise. This guide presents the 4-point method from the Healthy Knees Strength Book and shows the advancement options for each exercise. Be sure to master the beginning moves before moving on to the next challenge. If you have any questions, please contact me at hello@HealthyKneesCoach.com

The guide is a blend from both books and organizes the exercises by the 4 building blocks for healthy knees, many offering advancements and bonus information.

MOVEMENT FOUNDATIONS

In our Movement Foundations, we start with the essential movement elements that are the foundation for everything else.

There are eight Movement Foundations:

- Short Foot
- Pelvic Tilts
- Abdominal Bracing
- Belly Breathing
- Glute Pops and Quad Squeezes
- Knee Knockouts
- Weight Shifts
- Elements of the Squat

BALANCE TRAINING

We have four essential balance training moves for you:

- Tandem Balance
- Single Leg
- Tree Pose
- "T" Pose

STRENGTH TRAINING

Muscle development is part of gaining strength, building stamina, and creating freedom of movement.

Strength Training: Knee Dominant

There are four main Knee Dominant moves:

- Terminal Knee Extension
- Sit t to Stand
- Goblet Squat

- Step Ups and Step Downs

Strength Training: Hip Dominant

There are five main hip dominant exercises, each with variations:

- Y-Balance
- Hip Hinge
- Glute Bridge
- Side Leg Lift
- Deadlift

Strength Training: Ankle and Calf

We focus on one main ankle and calf strengthening move and offer many variations:

- Standing Heel Raise (& variations)

Strength Training: Core

There are three main core moves with variations and advancements:

- Pallof Press
- Suitcase Holds
- Bird Dogs

STRETCH TECHNIQUES

Stretching is divided into three main groups with specific exercises for each.

Dynamic Stretches

- Quadruped Rocking and Hold
- Pigeon Rocking
- Hip Hurdles
- Swivel (Hula Hoop!)

Static Stretches

- Calf
- Hamstring
- Side Leg Stretch
- Figure 4 Hip
- Quadriceps
- Half-Kneeling Hip Flexor

Release Techniques

- Trigger Point
- Foam Rolling

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MOVEMENT FOUNDATIONS

Short Foot

Purpose: Short Foot exercises are used to strengthen the foot muscles (especially the arch) and improve your balance. If the arch of your foot collapses, then it follows that your knees may become knock-kneed (or valgus).

How to: Best done barefoot, while seated or standing. Grip the floor with your toes and lift up with your arch...like you are trying to suction your foot to the floor. If you look at your bare foot while doing this, your foot actually gets a little shorter (thus the name).

It is not a big movement, but will work to strengthen foot muscles, improve leg alignment and balance.

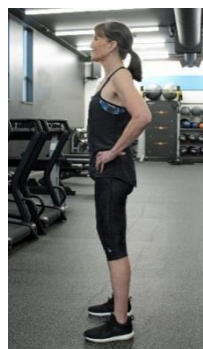
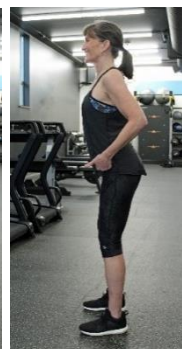
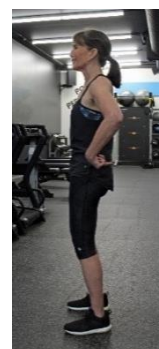


Pelvic Tilts

Purpose: Pelvic tilts serve as a good education exercise to allow you to better feel your abdominals and their actions. This will allow you to better utilize them during exercise. This exercise also helps to correct for anterior pelvic tilt where the hip flexors are shortened, and hip extensors are lengthened causing an excessive curvature of the low back.

How To (Standing): Stand with your feet hip distance apart and relax your spine. Place your hands on your hips and rock your pelvis forward (to create more of an arch in your low back), then rock your pelvis back (to create less of an arch in your low back).

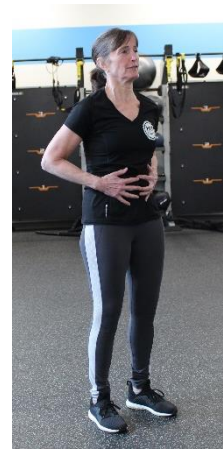
How To (Lying on the Floor): Lying face up, with your knees bent and your feet flat on the floor, place your hands under your low back. Using your hips and abdominals, press your low back into your hands or the floor. You'll feel like you are rotating your pelvis. Now release the pressure and create a small arch in your back by pressing your pelvis down toward your butt.



Abdominal Bracing

Purpose: We want to help you understand where your core muscles are located so you have better control. Abdominal bracing is all about contracting your core muscles...like you are bracing yourself against someone who is going to tickle you! As you do this, you create a natural belt or girdle of muscle that protects you. The muscles involved are the transversus abdominis, the rectus abdominus, the internal and external obliques, the pelvic floor muscles, and the multifidus muscle.

How to: While standing with feet hip width apart, squeeze or contract your belly as if someone is going to tickle you. At the same time, suck up the floor of your abdomen as if you are guarding (or pulling up) your private parts (the same feeling as doing a “Kegel”).



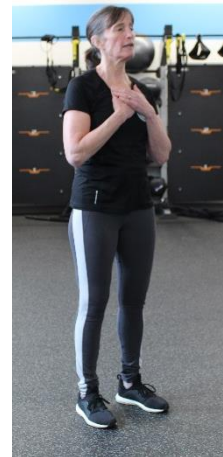
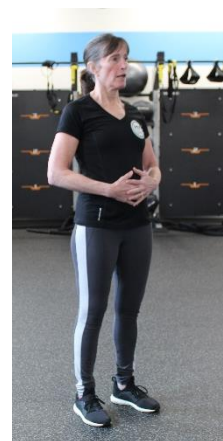
Belly Breathing

Purpose: Well, of course we all need to breathe. But HOW we breathe makes a difference, especially during exercise. We want you to become aware of your breath and how you can breathe deeply rather than shallowly.

How to: Place your hands on your chest and take a breath in through your mouth, visualizing that you are breathing into your hands. Now, place your hands on your belly and take a deep breath through your nose and notice how your belly expands and the breath feels deeper than when you had your hands on your chest. Exhale through your mouth.

Next, keep your hands on your belly and try to replicate that deep breath while breathing through your mouth. We want to train your breathing to be nice and deep, no matter if you take in your breath through your nose or your mouth.

When you breathe through your nose, your olfactory nerves are stimulated to signal to your brain that oxygen is coming in and you will naturally take a deeper breath. This is not true for mouth breathing and so training yourself to breath deep will help during exercise – or even for stress relief.



Glute Pops and Quad Squeezes

These two sound like they should be summer-time desserts, but alas, they are exercises (that you can do anytime!)

Purpose: Let's make sure that you understand how to engage certain muscles: your gluteus maximus (butt) and quadricep (front of thigh) groups. With knee injuries or post-knee surgery, sometimes it's a little bit harder to "connect" with these muscles. We want to make sure that you are in control.

How to (Glute Pops): Lie on your back with your legs straight. Now squeeze your butt (gluteus maximus) and you should feel your hips rise. Try squeezing only one side and then the other. If getting on and off the floor is a challenge for now, you can do this one sitting in a chair.

How To (Quad Squeeze): Sitting on the floor, place

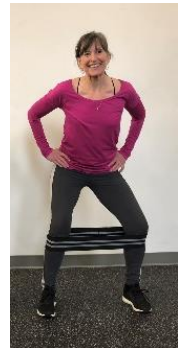
a rolled-up towel or foam roller under one knee. Now squeeze your thigh (quadriceps) so that your leg straightens. Repeat on other leg.

Knee Knockouts

Purpose: Knee knockouts work on hip stability and gluteus minimus and medius strength (side butt muscles).

How to: With a mini-band around your knees (can be at knees, above or below, find what is comfortable), assume a stance slightly wider than hip width.

Try holding your foot stable on the floor and swing your knee to the side. If you do not feel the movement through your thigh and hip, try pivoting on the foot as if squishing a bug, slowly allow one knee to fall in towards the other, with the movement being produced from your hip. Then, press the moving knee back out into the band, returning past the start position.

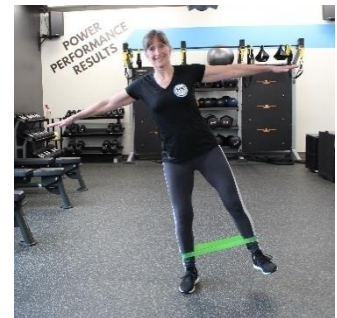


Weight Shifts (Drunken Starfish)

Purpose: We are beginning to work on a little balance here and waking up those “side butt” muscles, the gluteus minimus and gluteus medius.

How to (without band): Standing upright with legs shoulder-width apart, slowly shift weight from one foot to the other as you rock side to side. You are not going to take one foot off the floor just yet. Rather, simply shift the majority of your weight from one foot to the other, rising to the ball of the non-weight-bearing foot. When you feel stable, then start rocking and lifting one leg off the ground while keeping the same distance between your legs.

How to (with band): Add a mini-band around your knees, mid shin, or ankle--the lower it is, the more challenging. The addition of the band will add resistance and you will have to work to keep from allowing the band to pull your leg inward.

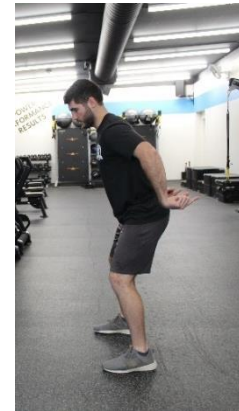
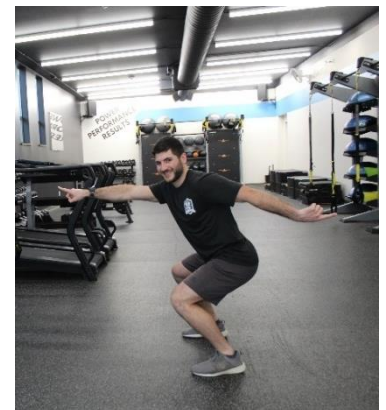


Elements of the Squat

So many folks with knee issues fear squats and I can understand why, because they can hurt! But they don't have to, and we hope to show you how best to squat for your body.

Purpose: Squats are a needed movement for everyday living. Learning to perform them properly so that you do not experience knee pain can be life-changing!

How to: We like to break down the squat into a flow of three pieces: Hip hinge, knee bend, open chest with flat back. Start with your hands pressed together in front of you and your feet around hip width apart. It is important to note that feet hip width apart is just a societal “normal.” It is a good starting position, but many people will require a wider or narrower squat stance to promote proper depth, comfort, and performance. Play around with the width of your feet, and how pointed out your toes are to find the most comfortable position for you.



Pictures: Hip break first, as hips go back, knees come forward (pointing for demonstration purposes only).



BALANCE TRAINING

Tandem Balance

Purpose: The Tandem Balance takes your normal wide stance (feet under hips) and makes it narrow (feet in alignment with heel touching toe) in order to work on balance.

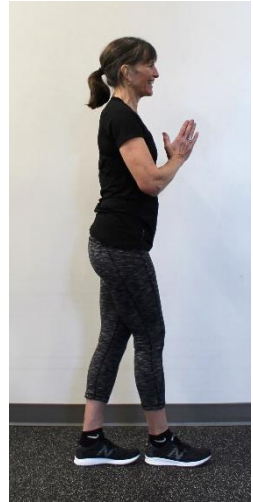
How to (with support): Stand near a wall and use one hand to gently support yourself as you get the feeling for this balance move. Place equal weight on each foot.

How to (without support): While standing, place one foot directly in alignment with the other with heel touching toe. Place equal weight on each foot. Then shift weight forward to put more weight on forward leg and shift weight backward to place more weight on back leg. Rock back and forth pausing with balance on each leg.

How to (with head turning): Once you feel balanced without support, with your eyes open, try turning your head to look over your right shoulder, then over your left.

How to (with eyes closed): Go back to the corner for this. Align your feet, get balanced, then close your eyes and maintain your balance.

How to (with movement): Right foot planted, move left foot in front, get balanced, then move left foot behind, get balanced. Change to your left foot planted with rotating your right foot in front and in back. Then keep advancing with several steps forward followed by several steps backward. When all of that feels pretty simple, rotate your head to look left and right as you step.



Single Leg

Purpose: To shift your center of gravity to one leg and give a challenge by wiggling and jiggling while you brush your teeth!

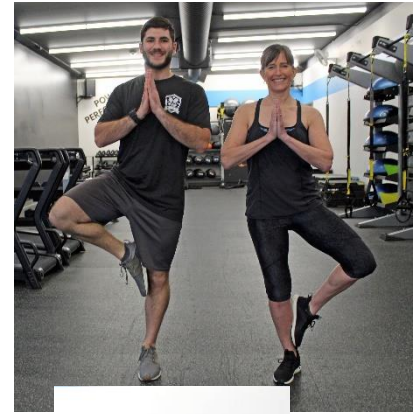
How to: Practice standing on one leg and add the challenge of brushing your teeth. Stand on one leg for the uppers and switch to the other leg for the lowers.



Tree Pose

Purpose: To shift your center of gravity in order to challenge your ability to balance. Try this balance move only after you feel you are stable with the single leg balance.

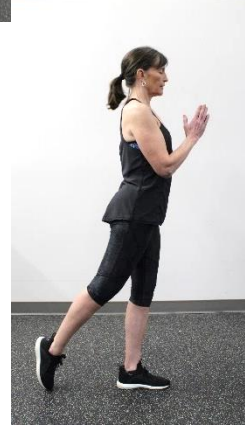
How to: With your hands pressed together in front of you, shift your weight to one leg. Then lift the other foot and with your knee pointing out to the side, place your foot as high as you can on the inner side of your supporting leg - on your ankle, calf, knee, or thigh. Check your posture and stand up tall!



“T” Pose

Purpose: We are using movement and a changing center of gravity to challenge your balance. Try this move after you feel stable with the single leg balance and tree pose.

How to: Shift your weight to one leg. Now imagine that you are a surfboard, from your shoulder to the foot of your non-weight bearing leg. Begin by starting the hinge at your hip and as your torso hinges toward the floor and your hands pressed together reach forward in line with the “T”, your non-weight bearing leg will lift up to keep surfboard straight from shoulder to ankle (or the best you can). Ultimately you are trying to form a “T” with your supporting leg as the base and the two arms of the T as your lifted leg and leaning torso with arms extended.



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STRENGTH TRAINING

STRENGTH TRAINING: KNEE DOMINANT

These exercises directly work the muscles affecting the knee joint. Some moves have multiple variations and progressions that you will see in the exercise descriptions.

There are four main Knee Dominant moves:

KD 1 Terminal Knee Extension

KD 2 Sit to Stand

KD 3 Goblet Squat

KD 4 Step Ups

KD1 Terminal Knee Extension

Purpose: We want to get the attention of your quadricep muscles and make sure they are doing their job. This exercise is a good precursor to the squat.

How to: Attach your mini-band through the Suspension Strap or around something solid like a table leg.

Step one leg inside the loop, bringing the band up to your knee. Stand far enough away from the table leg so that there is tension on the band. Allow the banded knee to bend as the band pulls it forward. Use control! Then squeeze your quadricep muscles as you straighten your leg at the knee.



KD2 Sit to Stand

Purpose: The “Sit to Stand” action is a basic life movement. We want you to feel strong and balanced, maybe even so strong that you don’t have to push yourself up when you go to standing. We love the independence that this strength brings. This move uses primarily your thigh and butt muscles.

There are four progressions of Sit to Stand to ultimately bring you to perform a squat. Start with #1 Wall Slides and work your way to #4 Sit to Stand with no Weight. Remember, master your form before you move on to the next difficulty.

If you see that your knees are caving in as you squat, place a mini-band around both legs just above the knees and keep tension in the band throughout the movement.

KD2 Sit to Stand #1: Wall Slides

Wall slides begin to strengthen thigh muscles with the support of a wall so that you are not fully weight bearing to your feet.

How to (Wall Slides): Start with leaning your back against a wall and feet about 2 foot lengths in front of the wall with knees are slightly bent. To perform the move, slide your back down the wall as you bend your knees until you come close to a “sitting” position. The goal is to bring your thighs parallel to the floor with a 90 degree bend in your knees, but it may take some practice before you can do this.

Adjust your feet so that your knees do not slide far in front of your toes. If your knees hurt during this move, try sliding down only as far as is comfortable, then push yourself back up. Hold the sitting position for 5 seconds then return to standing by sliding back up the wall to the start position. Work up to holding the sitting position for 60 seconds at a time.

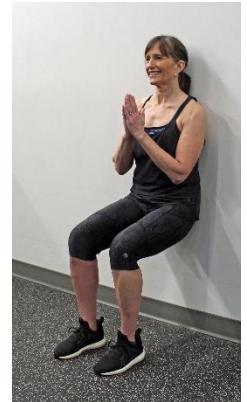
This is an exercise favored by skiers to strengthen quad endurance.

KD2 Sit to Stand #2: Suspension Strap Squat

Suspension Strap Squat provides support from your arms holding on to the Suspension Strap. If you do not have access to a Suspension Strap, stay with the Wall Slide or move to the Sit to Stand with Counterbalance.

How to (Suspension Strap Squat start with bent arms): While facing the anchor point of the Suspension Strap, grip the handles and place elbows at your side, creating tension on the Suspension Strap with a slight lean backwards of your body (keep your body in a “surfboard straight” position from ankles to shoulders). Then lower into the squat position while straightening your arms. You can use your arms to assist you return to a standing position. Go as low as feels comfortable. If you feel pain, stop just before that point. Conduct the Suspension Strap Squat and return to stand over 2-3 seconds each direction.

How to (Suspension Strap Squat with straight arms): For an added challenge while still assisted by the Suspension Strap, start in a standing position with arms straight and a slight lean backward. Lower into the squat position and



return to standing while your arms are straight. This way you are not using your arms as much to assist you in the return to standing. Conduct the Suspension Strap Squat and return to stand over 2-3 seconds each direction.

KD 2 Sit to Stand #3: with Counterbalance

The assistance here in this move comes from holding a weight at chest level and pressing that weight away from your chest as you sit. This acts as a counterbalance to the weight of your hips as you hinge and press your booty back to sit.

How to: Start standing with your feet shoulder width apart in front of the chair (or bench or Plyobox) you are going to sit on. Hold the weight at chest height and press the weight forward, keeping arms parallel to floor as you hinge your hips back and lower your booty toward the chair.

When you return to standing, start with the weight pressed out and then bring it back to your chest as you rise to stand. As you get stronger, you'll use a progressively lighter weight to assist.



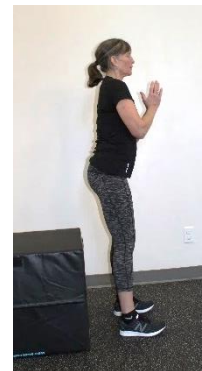
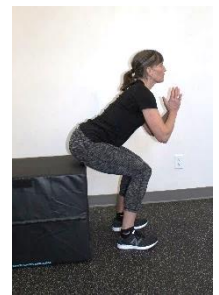
KD 2 Sit to Stand #4: No Weight

Once you feel like you have accomplished the Sit to Stand with a low weight, now it is time to try it with no weight.

How to: Start with holding your arms out in front if that helps to bring balance as you lower onto the seat and return to standing.

Alternative Sumo Squat: This squat also works on balance and a shift in muscles.

How to: Take a wide stance with toes pointed slightly out. Lower into the squat and when you return to standing, shift your weight in order to raise one leg off the floor.

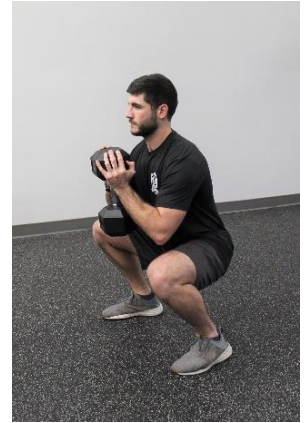


KD 3 Goblet Squat

Purpose: The goblet squat works not only your legs and butt, but also arms, shoulders, and core as you hold and stabilize the weight.

How to: Hold a dumbbell vertically with your hands, cupping the top end of the weight like you are holding a big goblet. Hold weight at high chest level, with elbows pinned at your rib cage. Feet are about hip width apart, with toes pointed forward or slightly out.

Keep your arms close to your chest and elbows pointing down. Bend your hips, then knees, to lower your body into a squat position as low as you can comfortably go over about 3 to 5 seconds. When you return to standing, drive through your glutes, legs, and heels to return to starting position, over about 3 to 5 seconds. Maintain control in both down and upward movements.



KD 4 Step Ups and Step Downs

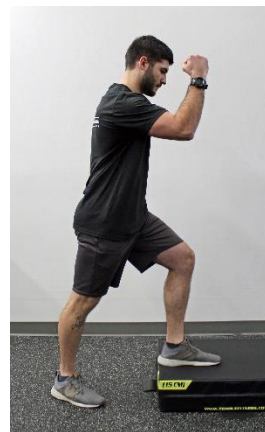
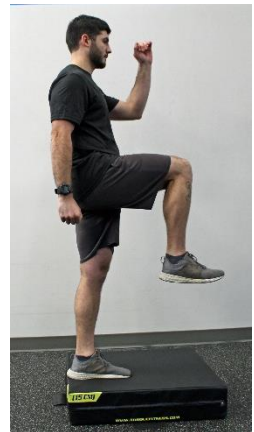
Purpose: Climbing stairs is an everyday activity and we want you to be able to do this comfortably and with confidence. These moves build strength and control.

There are two variations for this exercise: Forward-Facing Step Up and Side Facing Step up to help strengthen and prepare you for stairs.

KD 4 Forward-Facing Step Up

How to: Start with a four-inch rise step. Most aerobics benches are about four inches without any risers. Most stair risers are six to seven inches high, which may be too high at the start. Place one foot of your working leg (right leg) on the stair and as you bring the left foot up to the stair, think of pressing through your right hip as you step up. Then step your left foot back to the floor. Repeat on your right leg up to 15 times, then switch to the left.

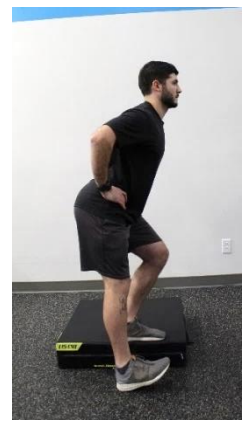
Advance this Move: As you get stronger and 15 repetitions are no problem, advance to a higher rise or add holding a dumbbell in each hand. Keep on advancing as long as there is no pain.



KD 4 Side-Facing Step Downs

How to: Starting with a four-inch-high step, align your foot to the length of the step so you are side-facing (if this was a stairway). Start with one foot on the step and one on the floor. Rise to a stair-standing position, pushing through the hips and straightening your knee. Bring your non-weight bearing leg level to the stair, but not on it. Then as you slowly lower, try to touch down with your heel or a flat foot, not your toe. This forces you to have more control with the weight bearing leg on the stair.

Advance this Move: As you get stronger with this move, instead of landing with a flat foot, try just touching your heel to floor, then return to stair standing position. Advance by increasing the step height or add holding a dumbbell in each hand.



STRENGTH TRAINING: HIP DOMINANT

The exercises that directly affect the hip also act on the pelvis and thigh bone (femur). Since the femur is also part of your knee joint, what happens at the hip affects the knee.

There are four main hip dominant exercises, each with variations:

HD 1 Y Balance

HD 2 Hip Hinge

HD 3 Glute Bridge

HD 4 Side Leg Lift

HD 5 Deadlift

HD 1 Y Balance

Purpose: We are incorporating balance and movement through the hip to improve strength and stability.

How to: *If you need balance support, use the anchor point strap attached to your door.* Imagine there is an uppercase, upside-down “Y” on the floor. You will be standing on one leg, with your foot in the middle of the Y. Your goal is to keep all your weight and body mass over the standing leg. Both legs will have a slight bend at the knee. As you slide the foot of the opposite leg



along each back portion of the Y, bend the knee and hinge at the hip of your supporting leg as your body lowers to reach as far as you can with your sliding foot. Return sliding foot to the middle and stand upright each time.

Advance this Move: As you progress with the exercise, work on adding the “stem” of the Y by sliding your foot (heel) forward as you bend and load the supporting knee.



HD 2 Hip Hinge

Purpose: the hip hinge primarily targets your “backside” or posterior chain, with your glutes, hamstrings, and low back.

Start with the Suspension Strap supported Hip Hinge. If you do not have a Suspension Strap, move on to Hip Hinge #2 with Dowel.

Hip Hinge #1: Suspension Strap (supported)

Purpose: The Suspension Strap will give you support and let you feel the movement of pushing your hips back as you hinge forward.

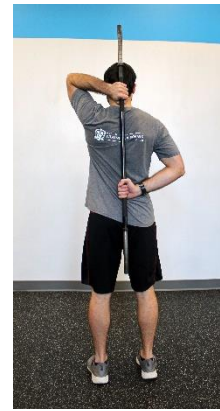
How to: With the Suspension Straps at mid-length, stand facing the anchor point with your arms straight and hands pressing down on the Suspension Strap handle. Feet are about shoulder width apart. Inhale as you bend forward with a flat back, pushing your hips back and surfing your hands forward. To return to standing, exhale as you push your hips forward and keep the downward tension on the Suspension Strap handles.



Hip Hinge #2: with Dowel

Purpose: Holding a dowel against your spine helps to prevent you from “cheating” by bending your back and releasing work from your hips and hamstrings.

How to: Use a broom stick or any sort of dowel to help force a flat back. Put the dowel behind you and hold it to your spine with one hand in the small of your back and one in the nape of your neck. Keep the dowel touching your head, middle back, and butt as you reach your hips backwards and poke your chest out in front of you. Picture pushing in a drawer with your hips, or boxing someone out in basketball.



Hip Hinge #3: Good Morning

Purpose: This unsupported move prepares you for the deadlift and squat.

How to: Start standing with your feet shoulder width apart and place your hands on your chest. Use good posture with shoulders back and brace your abdominals. Inhale as you hinge forward at your hips, pushing your booty behind. Have a slight bend in your knees. Try to create a 90-degree hinge, so your torso is parallel to the floor. Exhale as you return to standing.

Advance this Move: To make this move a little more challenging, change your center of gravity by placing your hands behind your head.

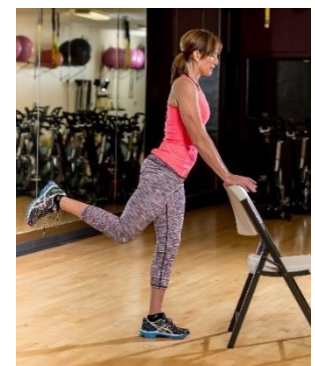


HD 3 Glute Bridge

Purpose: The Glute Bridge helps strengthen your posterior chain (backside) with emphasis on the big butt muscle (gluteus maximus) and back of thigh (hamstrings). It also serves to strengthen core muscles and can often alleviate low back pain.

How to (Standing Hip Extension Option): If the start position on the floor is a bit too difficult for you, stand erect, using support with hands on a wall or the back of a chair. Squeeze your butt and lift one leg, with a slight bend in your knee, slightly backward. Be mindful to keep your hips stable and do not arch your back. You may only lift your foot about three to four inches off the floor.

If you are not sure you are doing this right, place one hand on your butt and you should feel it tighten as you lift your leg behind you.



How to (Supine position): Lie face up on the floor (supine), with your knees bent and feet flat on floor with heels as close to your booty as you can. Place your hands on the floor, palms down next to your hips. Exhale, squeeze your butt, and lift your hips off the ground so that you form a straight line from knees to shoulders. Work to hold the elevated position. Inhale as you return your hips to the ground.



If you notice that your knees dip together during the hip bridge, place a mini-band around both of your legs, just above your knees. Perform the exercise while keeping tension on the mini-band, not allowing it to go slack as you raise your hips

Advance this Move: Marching in place

While in the bridge position and keeping hips high, “march” your feet, lifting one leg off the ground at a time. Try not to rock your hips or let them drop.



Advance this Move: Single Leg

When you feel stable with marching, try single-leg. In the starting position, squeeze your butt and lift one leg off the floor, pointing your foot at the ceiling. Drive your hips up into the bridge position, keeping your hips level to the floor. Return to start and repeat.

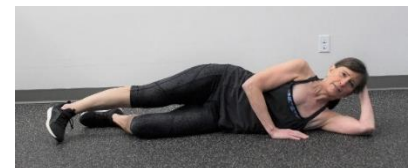


HD 4 Side Leg Lift

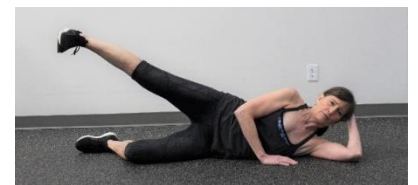
Purpose: The Gluteus Medius and Minimus are two of the butt muscles that help stabilize the pelvis and are the prime movers and controllers for side leg movement.

Are you doing the moves right? If you feel the work happening in your thigh (quadriceps), that means your toes are pointing up and you need to point your toes toward the wall (not ceiling) or even toward the floor. You should definitely feel the work in your side butt, not on the front of your thigh.

How to (standing): Stand side facing to a wall with closest hand for support, other hand on hip. With your knee straight and your toes pointed forward (not up!), exhale as you raise your leg to the side. Do not shift your hips as you do this exercise. Inhale as you return your leg to the start position.



How to (side lying on floor): Lie down on your side with legs extended and stacked so that your body is in a straight line. With toes pointed forward or toward the floor, exhale as you lift your top leg. Inhale as you return your leg to the stacked position.



Add a mini-band around your legs for added resistance and challenge

Advance this Move (side plank position):

Start with a side plank with either the lower leg bent for support at the knee or straight with feet stacked. This move also works on your core!

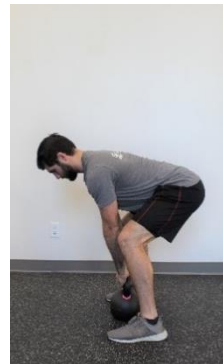
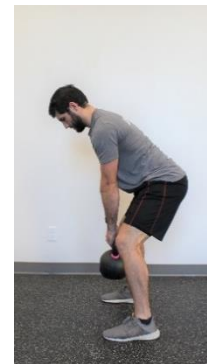
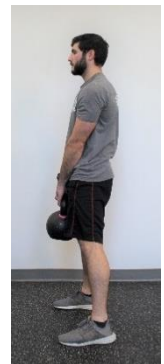


HD 5 Deadlift

Purpose: The deadlift directly targets all of the major muscle groups that are responsible for strong posture, core strength, and leg power. The primary muscle groups include gluteus maximus (butt), hamstrings (back of thigh), quadriceps (front of thigh), extensor spinae (low back), trapezius (upper back) and many other supporting muscles from your calves to core.

The key to success with the deadlift is to start with a light weight so that you have the proper form before going to a heavier weight. You can use a kettlebell or single dumbbell held with both hands.

How to: Stand erect with your feet shoulder width apart, with the weight on the floor between them. Deadlifts should be performed with the feet directly underneath the hips, but small adjustments can be made to accommodate the weight, as well as comfort. Bending at the waist, reach down and grab the weight. Before standing up, make sure to flatten your back, and reach your hips back and slightly up to create tension in your hamstrings. The hips should be slightly higher than your bent knees.



Your shoulder blades should be squeezed together and arms straight and close to your body (but not elbows locked) as you grab the weight. From here, take a deep breath in, squeezing your midsection tight, and push the floor away with your full foot. Slowly lift the chest keeping the arms straight. In doing so, the weight will slowly lift from the floor. Squeeze your butt tight at the top of the position

Advance this Move: Staggered Romanian Deadlift

This style of deadlift puts more work in your forward leg.

How to: Start standing and shift your weight to one leg (left) and take one step back with your right foot. Hold the weights in each hand with straight arms and keep them close to your body. As you hinge at the hips with slightly bent knees, lower the weights to about knee level then return to standing.

Advance this Move: Single Leg Deadlift

The Single Leg Deadlift helps you to work on balance and single leg strength.

How to: Start standing and holding weight with straight arms near your forward leg. Stagger your step and put your weight into your forward left leg. As you lift your right leg up, your torso will lean forward to create a “T” stance and weight will point toward floor and stay close to your shin as you lower and rise.

STRENGTH TRAINING: ANKLE AND CALF

Your calf muscles help bend your knees and lift the heel and point your toes (plantar flexion). The fronts of your shins help control the lift of the top of your foot (dorsi flexion). Strengthening your lower leg muscles will help give you more control of leg movement and that is good for your knees!

We focus on one main ankle and calf strengthening move and offer many variations:

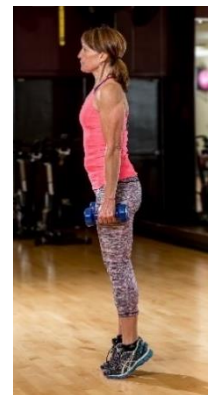
Standing Heel Raise

How to: Start out standing near a wall for balance. With your feet hip width apart, lift your heels off the floor while pressing into the balls of both feet. Keep good posture with abdominal muscles pulled in so that as you lift your heels, your body shifts upward rather than forward or backward. This is one of our favorite moves to practice while standing in line at the grocery store.

Form tip: Place a tennis ball between your ankles to help your ankles to stay in line and not roll away from your mid-line.

Standing Heel Raise: with Weights

How to: Hold dumbbells at your side as you raise and lower your heels to increase the resistance and challenge. Keep increasing your weight as you get stronger. You can still use the tennis ball between your heels to ensure your ankles are not rolling out.



Standing Heel Raise: on Stair

How to: Standing with the balls of your feet on a stair, allow your heels to drop lower than the stair, then press up to the balls of your feet. Hold on to the stair rail or balance on the wall. Do this one slowly and with control as you stretch your Achilles Tendon with the heel drop.



Standing Heel Raise: Single Leg (supported or unsupported)

How to: Using a wall for stability, balance on one leg and raise your heel. When you feel confident, try this move without support.



STRENGTH TRAINING: CORE

Strengthening your core muscles is important for stabilization of your hips and spine. There are thousands of core strengthening moves. We selected a few that can be done standing and others that require getting on hands and knees on the floor. If knees on the floor is a challenge for you, try kneeling on a foam pad to give a little more cushion and support.

There are three main core moves with variations and advancements:

- Pallof Press
- Suitcase Holds
- Bird Dogs

Pallof Press

Purpose: The Pallof Press is an anti-rotation exercise that strengthens core muscles that help stabilize and protect your low back. The exercise was invented by physical therapist John Pallof.

We love this exercise because you can do it standing, where many other core exercises require you to get on/off the floor.

How to: Use the Suspension Strap attached low and high and slide the handle to chest height. with handles to perform the Pallof Press. Hold the handle with both hands. Start side-facing to the attachment point in an athletic position (feet shoulder width apart, slight bend in knees, chest up). Bring the handle to your chest and there should be tension on the band.

Exhale and press the handle straight forward. Resist the pull of the band toward the attachment; this is the “anti-rotation” part of the exercise. Return the handle to your chest. The slower you move, the harder it is.

Pallof Press Variations:

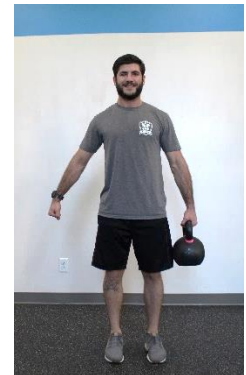
- Pallof Press with 5 second hold.
- Pallof Press with J-hook (Make a “J” movement when you are at straight arm press).
- Narrow your foot stance (bring feet closer together).
- Change feet to a lunge stance (one foot forward, one back).
- Pallof Press – walk out: as you are holding the press, take a step away from the anchor point, hold, and step back in.



Suitcase Holds

Purpose: The suitcase hold is a basic but very functional exercise that strengthens core, shoulders, upper back, arms, and legs, as well as grip strength.

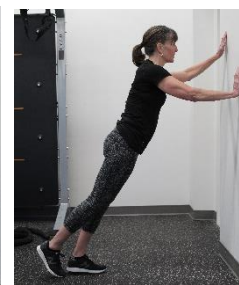
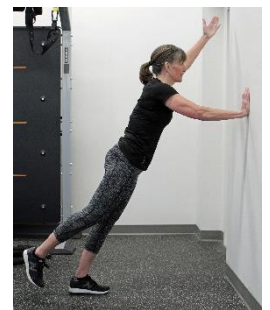
How to: Use a dumbbell or kettlebell, or a heavy suitcase! Choose a weight that is heavy enough to create resistance, but not so heavy that it forces you to shift your posture. With feet shoulder width apart, core muscles engaged, and shoulder blades pulled down and back, hold the object with one hand. Either simply hold the weight while standing in place or walk forward while maintaining good posture. Switch weight to other hand and repeat.



Bird Dogs

Purpose: This move will help you improve core strength and balance.

How to (standing option): If getting onto hands and knees is not yet for you, try starting this move standing. Start with your hands on a wall at shoulder height, bearing some of your



weight. As you step farther away from the wall, you'll place more weight in your hands. Keep your core tight and try to keep your body surfboard straight. As you slide one hand up the wall, lift the opposite leg behind you, keeping your leg straight and squeezing your butt. Only lift your leg as high as you can without arching your back. If you don't feel like you are doing this right, try poking yourself in the butt side of the lifting leg and making that muscle tense. Return to start and switch to other sides.

How to: Start in tabletop position with hands and knees on floor with wrists directly under shoulders and knees under hips. Extend one arm without shifting your hips. Next, extend the opposite leg without shifting your hips. Once you've mastered this, lift and extend the opposite arm and leg at the same time without shifting your hips. Return to the tabletop start position, then switch to the other sides. The longer you hold the extension, the more challenging it is. This is definitely a balance move as much as a core move.



Advance this Move: Bird Dog with Crunch

When you are stable with both combos of arm and leg, try the bird dog with crunch. This can be done standing or in tabletop position.

How to (Bird Dog with Crunch): After you extend and reach your arm and leg, bring your knee and elbow together under your belly for a crunch. Tighten your abdominal muscles as you do this: pull your belly in like you are zipping up a tight pair of pants. For this version, do all the repetitions on one arm and leg combination, then switch to the other side.



Advance this Move: Bear Holds

The bear hold takes the bird-dog to the next level of challenge with a greater focus on core strength and balance.

How to (Bear Hold): Start on your hands and your knees in tabletop position. Round your back towards the ceiling, and then lift your knees 1-2 inches off the ground, hovering there for a 5 count (working up to 30 second) hold. During the hold, focus on taking slow breaths in through your nose, followed by forced exhales through your mouth. As you exhale, attempt to squeeze your abdominals tighter and tighter.

Add a Bear Hold challenge: While you are in the "bear" position (knees off ground, weight in toes), pull your belly muscles tight and round up your back.



4

STRETCH TECHNIQUES

DYNAMIC STRETCHES

Dynamic stretching means you are moving through the stretch positions. It is a great way to prepare your muscles for the activity ahead. We use it to warm-up your hips and knees.

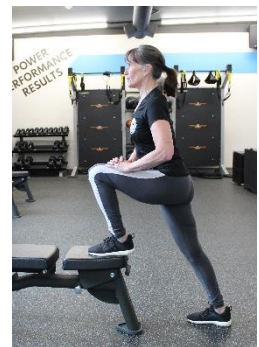
Quadruped Rocking + Hold

Purpose: This is a passive range-of-motion drill, meant to help provide more low level and low impact knee flexion volume; to promote better knee flexion ranges; and to gradually address the fear and sensation of deep knee bends.

After warming up your knee joint with the rocking, try holding the stretch for at least 30 seconds and up to 2 minutes at time (as long as it doesn't cause pain).

How to (Standing): If kneeling simply isn't something you can do just yet, you can do this warm-up while standing. Place your foot on a chair and rock into the knee bend until you feel pressure, but not pain.

How to (Table Top): Starting on all fours, with padding under your knees if needed, slowly rock your hips back towards your heels as far as possible, while staying within a tolerable level of discomfort (if there is any present with this movement). Try to keep your hips reaching back evenly, avoiding sitting farther back into one hip



compared to the other. Hold for a second at the deepest part of the movement, then rock back forward and repeat.

Pigeon Rocking

Purpose: This is a mobility drill designed to target the entire hip and its associated musculature, as well as the hip capsule itself. The goal is to open up both internal and external rotation at the hip, allowing for easier movement with some of the strength exercises later in the workout.

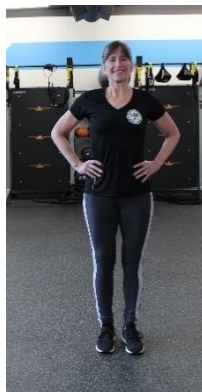


How to: Starting on all fours, straighten one leg as far as you can straight behind you. Then, swivel the other leg under your body to somewhere between a 45- and 90-degree angle compared to your midline. From here, take the straight leg, and reach it across your body, so you are creating more tension in the bent leg hip. Slowly rock your weight backwards and bend the straight leg knee to drop it to the floor. You should feel a stretch increase in the opposite hip. Slowly rock back and forth, bending and straightening the knee to allow you to sink deeper and deeper into the stretch.

Hip Hurdles

Purpose: To warm up your hip joint and work on mobility.

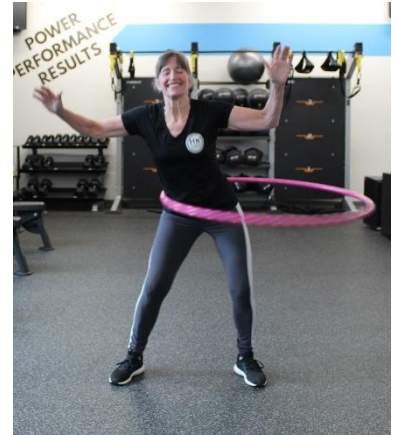
How to: Stand tall with your hands on your hips. Lift your right knee and leg up as if you are going to step over a fence or a hurdle. Rotate your knee to the right, keeping your leg high. Set your foot on the ground. Your feet should now make a 90-degree angle, with your left foot pointing forward and your right foot pointing to the right. Reverse the move by lifting your leg back up and over the imaginary hurdle. Place your foot back on the ground with both feet pointing forward. Repeat on left leg.



Swivel (Hula Hoop!)

Purpose: To warm up your hip joint and have some fun.

How to: Put your hands on your hips and make big hip circles. Do 10 in each direction. Pull in your belly button while you swivel. Use a hula hoop if you have one!



STATIC STRETCHES

Static Stretching means you hold the stretch position. To have the best results, static stretching should be done after you have warmed up or post exercise. We suggest holding each stretch from 30 seconds to two minutes.

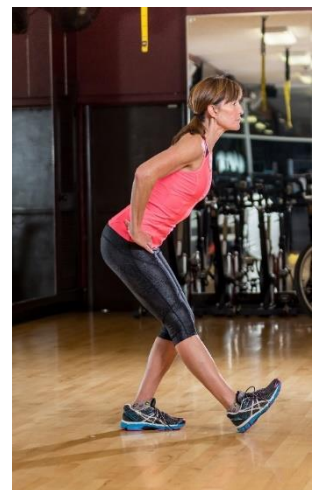
Calf Stretch

How to: While standing, take a large step backward with one foot. With both feet pointing forward, keep your weight on your bent front leg. Bring the heel of your back leg toward the floor for a calf stretch with a straight leg. Take in a deep breath, raise your arms and eyes to the ceiling, exhale and bring your arms back to your sides. Bring your feet together and repeat on the other side.



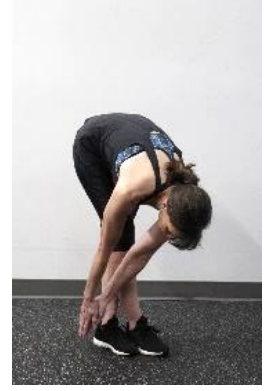
Hamstring Stretch

How to: While standing, step one foot forward. Leave the forward heel on the ground, straighten your leg, and raise your toes. Transfer your weight to your back leg with knee slightly bent and a flat back. Hinge forward at your hips. Rest your hands on the tops of your thighs or, if you need help with balance, hold onto a chair. Take in a deep breath. As you exhale, stretch a little more and lift our toe even higher. Step back to standing and repeat on the other side.



Side Leg Stretch

How to: While standing cross your left foot in front of your right so that your feet are side-by-side. Now press your hands together. Hinge at your hips and reach with hands toward the instep of your back (right) foot. Hold, then return to standing. Complete the stretch on the other side.



Hip Stretch

How to (Standing Figure Four): Start with a slight bend in your knees, and cross your left ankle over your right thigh, above your knee. To deepen the stretch, press on your left thigh (not your knee).



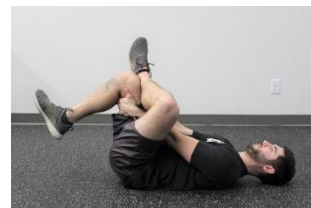
How to (Figure Four with Chair Assist): Shift your weight to your left leg and place right foot on a chair. Let the right knee and thigh press toward the floor. To deepen the stretch, press on your thigh (not your knee).



How to (Figure Four on the Floor): Lie with your back on the floor and cross your legs, bringing your knees toward your chest. Hug your knees and you should feel a nice deep stretch in your butt. To deepen the stretch, press your shins toward the floor, as long as this does not irritate your knees.



How to (Figure Four Reach Through): To make the floor stretch even deeper, cross your right ankle over your left thigh, just above your knee. Reach your right arm between your legs and clasp your left hand behind your left leg to gently pull your leg closer to your chest.



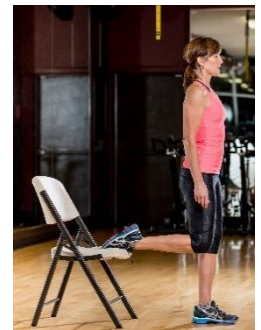
Quadriceps

Purpose: To improve range of motion through your knee and hip by stretching the quadricep muscles (on the front of your thigh). The basic movement is to bend at the knee bringing your heel toward your butt. Depending on your knee range of motion, you may need help with this one.

As you perform the stretch, keep your knees side by side and focus on standing tall with your hips pressed forward and shoulders back.



How to (Quad Stretch Assist with a Chair): Standing in front of a chair like you are going to sit down, raise one leg up behind you and rest the top of your foot on the chair with your knee pointing toward the floor. You might want to be near a wall for balance and may need to bend the supporting leg to deepen the stretch.



How to (Quad Stretch Assist with a Towel on the floor): Wrap the towel around your ankle and hold towel from behind your ankle. Lie down on your side, then pull the towel and your leg behind you so you feel the stretch in your quadricep muscle group.



How to (Quad Stretch Assist with a Towel, standing): Start standing and bend over to wrap a small towel around one ankle. Hold the towel near your ankle with the same side hand. As you return to standing, lift your towel-ankle toward your butt behind you.



How to (No Assist Quad Stretch): This is only for you if you have the ability to fully flex your knee. If you have limited range of motion, use one of the assists, above.

While standing, bring your heel toward your butt and grab onto your ankle. Your knees should be side by side and body erect. If you go through any gymnastics to do this or your knee is sticking out to the side, or if you are side bending one way or the other, *don't*! This poor alignment could strain your back. Use one of the assists, above.



Half Kneeling Hip Flexor

Purpose: This passive stretch is designed to provide a stretch to the hip flexor (iliopsoas) muscle group and improve hip mobility.

How to: Place the foam pad or pillow beneath the left knee as you get into a half-kneeling position with your left knee down and right foot on floor in front of you. The right hip and leg should be flexed to 90 degrees. Next, fully raise your right arm overhead like you are trying to reach the ceiling. Squeeze your right butt (glute) and slowly shift your torso forward, allowing the left hip to extend. You should feel the stretch through the front of your left hip. To deepen the stretch, tuck your hips (posterior pelvic tilt).

For an added challenge, lift your knee off the floor.



RELEASE TECHNIQUES

The current literature measuring the effects of self-myofascial release is still emerging. Fascia is a web of connective tissue that covers every internal structure of the body. We've included foam rolling in this book because I've personally had so much relief from performing regular rolling on my own legs. It is definitely worth a try – and, with time, if it makes you feel better, great! The trigger point method places pressure on a sensitive or sore spot in a muscle so that when the pressure is released, the muscle relaxes. Foam rolling and trigger point can be done either pre-or post-exercise.

Trigger Point: Piriformis Release

The Piriformis is a muscle deep in your butt that originates at the sacrum (near your tail bone) and attaches to the side knob (greater trochanter) near the top of the femur. It helps to lift and rotate your leg away from the midline. The piriformis can irritate the nearby sciatic nerve and cause “Piriformis Syndrome” with pain originating in the buttocks and radiating

down the leg. Of course, if you have sciatic nerve pain, please see your doctor! Sciatic pain can also be caused by compression in the spine.¹

Purpose: This trigger point method places pressure on a sensitive or sore spot in a muscle so that when the pressure is released, circulation increases and the muscle relaxes. I include this release because, to me, it feels good and I feel like it helps my butt and my legs stay a little more relaxed. Does it actually help relax the muscle? I don't know, but you will feel the difference as soon as you complete the move.

How to: Use the Hero Rollga ball or hard ball, such as a lacrosse ball or a tennis ball (I used a tennis ball so you could see it easier in the photos). While sitting on the floor with your legs extended straight in front of you, take the ball and pretend you are slipping it into your back right pocket. Gently "sit" on the ball and position it on the spot that feels the most tender. Now bend and straighten your right leg four times, sliding your foot toward your butt then back to straight leg. Next, with your right knee bent and foot on the ground, let your knee dip toward your left leg four times. Then, let your knee lower toward the floor away from your left leg, four times. Finally, straighten your leg, sit up tall, and ...this is where the magic happens... remove the ball and feel the "cave" in your butt. NICE! Make sure and repeat this release on your left side too.



¹ National Academy of Sports Medicine (2018) Piriformis: Is it Really Tight? Really? Retrieved on 12/28/19 from <https://blog.nasm.org/fitness/piriformis-is-it-really-tight-really/>

Myofascial Release: Foam Rolling

Foam rolling places a pressure (the roller) on your fascia and underlying muscle. I like to foam roll before I exercise when I am going to focus on range of motion; and after exercise, especially after long bike rides where my legs feel tired.

Pay special attention to your quadriceps, Iliotibial band, hamstring, and calf. There are many techniques to rolling, but the one I find most beneficial is to lie on the roller and start just above your knee (never roll directly on the joint). **Roll up about 4 inches, back 2 inches, up 4 inches, and back 2 inches, slowly inch-worming up your leg; then reverse direction and roll, using the same method back to your starting point.**

This does require a certain amount of core strength. If you are unable to maneuver your body onto the floor to use a foam roller, you can try sitting in a chair with your leg relaxed and use an old fashioned rolling pin to roll your quads and IT band.

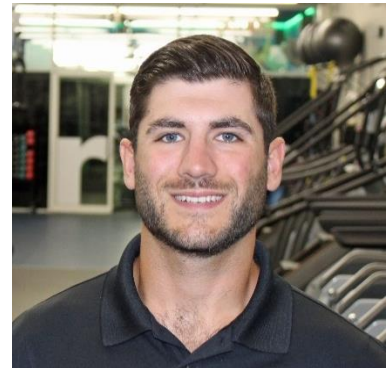




THE END... is only the BEGINNING

We are so happy to help you along your journey to better fitness and healthy and happy knees. For more information, visit us at www.healthykneescoach.com

Robin Robertson
Tyler Budwey



A handwritten signature in black ink that reads "Robin Robertson".

A handwritten signature in black ink that reads "Tyler Budwey".