

PEP *Plus* Program

[Prevent Injury and Enhance Performance: Based on the program developed by the Santa Monica Orthopaedic and Sports Medicine Research Foundation *Plus* modifications based on clinical experience and practical implementation of Body Dynamics, Inc's physical therapists and athletic trainers]

This is a 20 minute prevention/enhancement program that consists of a warm-up, stretching, strengthening, plyometrics, and sport-specific agilities to address potential deficits in the strength and coordination of the stabilizing muscles around the knee joint.

- It is important to use proper technique during all exercises.
- Coaches and trainers need to emphasize correct posture, straight up and down jumps without excessive side-to-side movement, and reinforce soft landings.
- This program should be completed at least twice a week (3x is better). Consider it your warm-up!!!
- The field should be set up 10 minutes prior to the warm-up. This will allow for a smooth and quick transition between all of the activities. A sample field set-up has been included in your packet.
- This program takes approximately 15-20 minutes to complete. Alongside each exercise you will notice a box with the approximate amount of time that should be spent on each activity. This will serve as a guideline to you in order to conduct your warm-up in a time-efficient manner.
- If you have any questions or concerns, please contact Christina Vink, ATC, Program Coordinator at BDI, or Jennifer Gamboa, DPT, OCS, President, BDI at 703.527.9557.

1. **Warm-up:** Warming up and cooling down are crucial parts of a training program. The purpose of the warm-up section is to allow the athlete to prepare for activity. By warming up your muscles first, you greatly reduce the risk of injury.

A. Jog line to line (cone to cone):

Elapsed Time: 0 - .5 minute



Purpose: Allows the athletes to slowly prepare themselves for the training session while minimizing the risk for injury. Educate athletes on good running technique; keep the hip/knee/ankle in straight alignment without the knee caving in or the feet whipping out to the side.

Instruction: Complete a slow jog from near to far sideline

Rule of the Knee!!!:

Knees in line with hips, in line with laces, and behind the tips of your toes

B. Shuttle Run (side to side)

Elapsed Time: .5 to 1 minute



Purpose: engage hip muscles (inner and outer thigh). This exercise will promote increased speed. Discourage inward caving of the knee joint.

Instruction: Start in an athletic stance with a slight bend at the knee. Leading with the right foot, sidestep pushing off with the left foot (back leg). When you drive off with the back leg, be sure the hip/knee/ankle are in a straight line. Switch sides at mid field. You should end up at the near sideline.

Rule of the Knee:

Knees in line with hips, in line with laces, and behind the tips of your toes;

AND

Rule of the Back:

Straight spine, belly in, shoulder blades squeeze back

C. Backward Running

Elapsed Time: 1-1.5 minutes



Purpose: continued warm-up; engage hip extensors/hamstrings. Make sure the athlete lands on her toes. Be sure to watch for locking of the knee joint. As the athlete brings her foot back, make sure she maintains a slight bend to the knee.

Instruction: Run backwards from sideline to sideline. Land on your toes without snapping the knee back. Stay on your toes and keep the knees slightly bent at all times. You should end up at the far sideline.

Cue: Heels up; Reach Back

Rule of the Knee:

Knees in line with hips, in line with laces, and behind the tips of your toes

D. Grape Vine

Elapsed Time: 1.5-2 minutes



Purpose: continued warm-up; engage abdominals and loosen hip joints; big movements in a transverse plane

Instruction: Start side stepping to the right, cross left foot in front of right foot – allowing pelvis to twist; side step right again, cross left foot behind right foot – allowing pelvis to twist. Switch directions at midfield to lead with left foot.

Cue: Big Twist

2. Stretching: It is important to incorporate a short warm-up prior to stretching. Never stretch a "cold muscle". By doing the exercises outlined here, you can improve and maintain your range of motion, reduce stiffness in your joints, reduce post-exercise soreness, reduce the risk of injury and improve your overall mobility and performance.

- Do the previous large muscle warm-up before stretching.
- Don't bounce or jerk when you stretch. Gently stretch to a point of tension and hold.
- Hold the stretch for 30 seconds. Concentrate on lengthening the muscles when you're stretching.
- Breathe normally. Don't hold your breath.
- Spread out along the near sideline

A. Calf stretch (30 seconds, 1 rep each side)

Elapsed Time: 2.0 to 3.0 min



Purpose: stretch the calf muscle of the lower leg. Hold for 30 seconds. Switch sides and repeat

Instruction: Stand leading with your right leg. Bend forward at the waist and place your hands on the ground (V formation). Keep your right knee slightly bent and your left leg straight. Make sure your left foot is flat on the ground. Do not bounce during the stretch.

B. Quadriceps stretch (30 seconds, 1 rep each side)

Elapsed Time: 3.0 to 4.0 min



Purpose: stretch the quadriceps muscle of the front of the thigh

Instruction: Place your left hand on your partner's left shoulder. Reach back with your right hand and grab the front of your right ankle. Bring your heel to buttock. Make sure your knee is pointed down toward the ground. Keep your right leg close to your left. Do not allow knee to wing out to the side and do not bend at the waist. Hold for 30 seconds and switch sides.

C. Figure Four Hamstring stretch (30 sec, 1 rep each side)	Elapsed Time: 4.0 – 5.0 min
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Purpose: To stretch the hamstring muscles of the back of the thigh.

Instruction: Sit on the ground with your right leg extended out in front of you. Bend your left knee and rest the bottom of your foot on your right inner thigh. With a straight back, try to bring your chest toward your knee. Do not round your back. If you can, reach down toward your toes and pull them up toward your head. Do not bounce. Hold for 30 seconds and repeat with the other leg.

Cue: Toes and knees point up; flat back and walk your hands down your legs

D. Inner Thigh Stretch (20 sec, front, right, left)	Elapsed Time: 5.0 – 6.0 mi
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Purpose: Elongate the muscles of the inner thigh (adductor group)

Instruction: Remain seated on the ground. Spread you legs evenly apart. Slowly lower yourself to the center with a straight back. You want to feel a stretch in the inner thigh. Now reach toward the right ankle with the right arm. Bring your left arm overhead to increase the stretch to the right. Hold the stretch and repeat on the opposite side.

E. Hip Flexor Stretch - (30 sec, 1 rep each side)

Elapsed Time: 6.0 -7.0 min

**Advanced**

Purpose: Elongate the hip flexors of the front of the thigh.

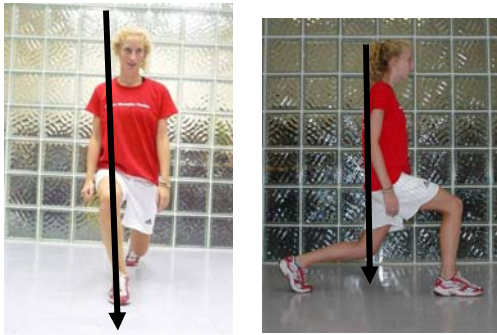
Instruction: Assume half kneeling position, right leg forward. Once in position, take a half step forward with your right foot to achieve proper alignment and distance. Press hips forward and belly back with a straight (rigid) spine. Hips should be square with your shoulders, and front knee should stay behind your toes. If possible, maintain your balance and reach back for the left ankle and pull your heel to your buttocks. Hold for 30 seconds and repeat on the other side.

Rule of the Back:**Straight spine, belly in, shoulder blades squeeze back**

3. Strengthening: This portion of the program focuses on increasing leg strength. This will lead to increased leg strength and a more stable knee joint. Technique is everything; close attention must be paid to the performance of these exercises in order to avoid injury.

A. Walking Lunges

Elapsed Time: 7.0-7.5 min



Purpose: Strengthen the thigh (quadriceps) muscle.

Instruction: Lunge forward leading with your right leg. Push off with your right leg and lunge forward with your left leg. Drop the back knee straight down. Make sure that you keep your front knee over your ankle. Control the motion and try to avoid your front knee from caving inward. If you cannot see your toes on your leading leg, you are doing the exercise incorrectly. Turn around at midfield and lunge back to near sideline.

Rule of the Knee:

Knees in line with hips, in line with laces, and behind the tips of your toes;

AND Rule of the Back:

straight spine, belly in, shoulder blades squeeze back.

B. Hamstring (20 reps, switch partners 20 reps)

Elapsed Time: 7.5 - 8.5 min



Purpose: Strengthen hamstrings muscles

Instruction: Kneel on the ground with hands at your side. Have a partner hold firmly at your ankles. With a straight (think rigid) back, press your hips forward and hinge at your knees. THIS IS A SMALL MOVEMENT. Your knees, hips and shoulders should be in a straight line as you lean toward the ground. Do not bend at the waist. You should feel the hamstrings in the back of your thigh working. Repeat 20 times. Increase reps as time and ability allow.

Cue: straight spine,
small hinge

Rule of the Back:

Straight Spine; tight tummy; shoulder blades squeeze back

C. Planks (3 reps x 30 seconds)

Elapsed Time: 8.5-10.0 min



Purpose: To strengthen primary muscles of core control: abdominals, lats, quadratus lumborum; glut medius and glut maximus.

Instruction: lower your self into a long plank position supported on your elbows and toes; keep tummy tight and back supported (no saggy backs); hold for 60 seconds, then flip to your right side, balancing on your right elbow and right foot (you can lower to your right knee if foot position is too hard); hold for 30 seconds. Repeat on the left. Increase seconds as time and ability allow.

Rule of the Back:
Straight Spine; tight tummy, shoulder blades squeeze back.

D. Single Toe Raises (20 reps, 1 set each side)

Elapsed Time: 10.0 - 11.0 min



Purpose: This exercise strengthens the calf muscle and increases balance.

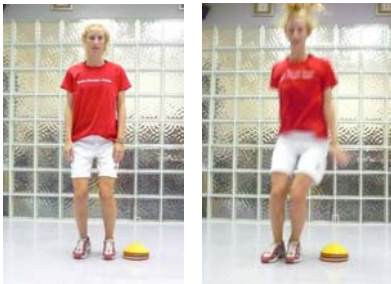
Instruction: Stand up with your arms at your side. Bend the left knee up and maintain your balance. Slowly rise up on your right toes with good balance. You may hold your arms out ahead of you in order to help. Slowly repeat 20 times and switch to the other side. Add reps as time and ability allow.

Rule of the Back:
Straight Spine, belly in, squeeze shoulder blades back

4. Plyometrics - These exercises are explosive and help to build, power, strength and speed. The most important element when considering performance technique is the landing. It must be soft! When you land from a jump, you want to softly accept your weight on the balls of your feet slowly rolling back to the heel with a bent knee and a straight hip. These exercises are basic; however, it is critical to perform them correctly. Please take the time to ensure safe and correct completion of these exercises.

A. Lateral Hops over Cone (20 reps)

Elapsed Time: 11.0 – 11.5 min



Purpose: Increase power/strength emphasizing neuromuscular control

Instruction: Stand with a cone to your left. Hop to the left over the cone softly landing on the balls of your feet land bending at the knee. Repeat this exercise hopping to the right. As you advance, increase the height of the cone to 6". If you are having difficulty with knee alignment, hold the soccer ball between your knees while you hop.

Rule of the Knee!!!:

Knees in line with hips, in line with laces, and behind the tips of your toes

B. Forward/Backward Hops over cone (20 reps)

Elapsed Time: 11.5 – 12.0 min



Purpose: Increase power/strength emphasizing neuromuscular control

Instruction: Hop over the cone softly landing on the balls of your feet and bending at the knee. Now, hop backwards over the cone using the same landing technique. Be careful not to snap your knee back to straighten it. You want to maintain a slight bend to the knee. Repeat 20 times. As you advance, increase the height of the cone to 6". If you are having difficulty with knee alignment, hold the soccer ball between your knees while you hop.

Rule of the Knee!!!:

Knees in line with hips, in line with laces, and behind the tips of your toes

C. Single Leg hops over cone (10 reps/1 set each side)

Elapsed Time: 12.0–12.5 min



Purpose: Increase power/strength emphasizing neuromuscular control.

Instruction: Hop over the cone landing on the ball of your foot bending at the knee. Now, hop backwards over the cone using the same landing technique. Be careful not to snap your knee back to straighten it. You want to maintain a slight bend to the knee. Repeat for 10 reps. Now, stand on the left leg and repeat the exercise. Increase the number of repetitions as needed. As you advance, increase the height of the cone to 6". If you are having difficulty with knee alignment, hold the soccer ball between your knees while you hop. Increase number of reps as time and ability allow.

Rule of the Knee!!!:

Knees in line with hips, in line with laces, and behind the tips of your toes

D. Vertical Jumps (10 reps, 1 set each side)

Elapsed Time: 12.5 – 13.0 min

**Purpose:** Increase height of vertical jump.**Instruction:** Stand forward with hands at your side. Slightly bend the knees and push off jumping straight up. Remember the proper landing technique by accepting weight on the ball of your right foot with a slight bend to the knee. Repeat 10 times and switch to the left.**Rule of the Knee!!!:****Knees in line with hips, in line with laces, and behind the tips of your toes****E. Scissors Jump (20 reps)**

Elapsed Time: 13.0 – 14.5 min

**Purpose:** Increase power and strength of vertical jump.**Instruction:** Lunge forward leading with your right leg. Keep your knee over your ankle. Now, push off with your right foot and propel your left leg forward into a lunge position. Be sure your knee does not cave in or out. It should be stable and directly over the ankle. Remember the proper landing technique; accept the weight on the ball of your foot with a slight bend to the knee. Repeat 20 times.**Rule of the Knee!!!:****Knees in line with hips, in line with laces, and behind the tips of your toes**

5. Agilities: Agilities are critical to promote soccer specific speed, coordination, and power.

A. Shuttle run with forward/backward (4 passes)

Elapsed Time 14.5 - 16 min

Purpose: Increase dynamic stability of the ankle/knee/hip complex

Instruction: Starting at the first cone, sprint forward to the second cone, run backward to the third cone, sprint forward to the fourth cone, run back to the fifth cone; shift over one row and repeat pattern as you return to near sideline; shift over one row and repeat to far sideline; shift over one row and repeat to near sideline.

B. Diagonal runs (3 passes)

Elapsed Time 16 – 17.5 min



Purpose: To encourage proper technique/stabilization of the outside planted foot to deter the position from occurring.

Instruction: Face forward and run to the first cone on the right. Pivot off the right foot and run to the second cone. Now pivot off the left leg and continue onto the third cone. Make sure that the outside leg does not cave in. Keep a slight bend to the knee and make sure the knee stays over the ankle joint. 2 rows of players go simultaneously; 2nd player at each station starts when 1st player is at 3rd cone. Jog back to start. Each player makes 3 passes.

Rule of the Knee!!!:

Knees in line with hips, in line with laces, and behind the tips of your toes

C. Bounding run (AKA Moonjumps) Elapsed Time 17.5 – 18.5 min



Purpose: To increase hip flexion strength/increase power/speed

Instruction: Starting on the near sideline, run to the far side with knees up toward chest. Bring your knees up high. Land on the ball of your foot with a slight bend at the knee and a straight hip. Increase the distance as this exercise gets easier. From near sideline to far sideline and back again.

6. Cool Down (after practice)

We all know how imperative a cool down is. Please do not skip it. It allows the muscles that have been working hard throughout the training session to elongate and deters the onset of muscle soreness. Please emphasize the importance of adequate fluid intake (optimally water). Athletes should have a water bottle by their side during the cool down. The cool down should take approximately 10 minutes. It should begin with a slow jog to allow the heart rate to come down before stretching. This should be followed by some light stretching.

Stretches: Hamstring, calves, inner thighs, quadriceps, low back (double knee to chest)*, piriformis (figure 4, knee to chest)**, and seated butterfly***. Hold each 30 seconds, and repeat right and left.

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7. Homework: Athletes cannot accomplish all the cross-training necessary to enhance their competitive edge and decrease their risk of injury in practice. Sometimes, homework is required. We recommend the following protocol to be executed at least one time per week at home.

A. Bridging (30 reps)



Advanced

Purpose: Strengthen outer hip muscles (Hip abductors, flexors) and buttocks

Instruction: Lie on the ground with your knees bent with feet on the ground. Rock back on your heels, and raise your buttocks up off the ground and squeeze. Lower down and repeat 30 times. As you get stronger, begin single leg bridges, making sure that you keep your hips even and don't arch your back.

B. Abdominal Crunches (30 reps x 2 sets)



Purpose: Strengthen the abdominals (rectus abdominus, obliques)

Instruction: Lie on the ground with your knees bent. Place your hands behind your head with your elbows out wide. Support your neck lightly with your fingers. Take a deep breath in and slowly contract your abdominal muscles as you exhale. Repeat 30 times. Drop your legs off to the right side. Slowly crunch up with your elbows out wide. You should feel your oblique muscles working on the side of your waist. Repeat 30 times and switch to the other side.

C. Abdominal Criss-Cross (30 reps x 2 sets)



Purpose: Strengthen the abdominals (rectus abdominus, obliques)

Instruction: Lie on the ground with one knee pulled to your chest and one leg stretched out so that you can still keep your back FLAT on the ground (you may have to lift your leg towards the ceiling to help protect your back). Place your hands behind your head with your elbows out wide. Support your neck lightly with your fingers. Take a deep breath in and contract your abdominal muscles as you turn your chest towards your opposite knee. Quick exhale for 2 criss-crosses; quick inhale for 2 criss-crosses. Repeat 30 times. Rest for 30 seconds. Repeat another 30 times.

I. Side Lying Butterflies (30 reps x 2 sets)



Purpose: To strengthen outer hips and prevent legs from caving in during cutting, running, and jump landings.

Instruction: Lie on side with your hips at a 45 degree angle, and your knees at a 45 degree angle. Tuck your arm under your head, align your spine to neutral (think upright posture while you are lying down!), and tighten your tummy. Keeping your feet together, rotate your top knee towards the ceiling. Repeat 30 times. Turn over and complete exercise on the other side.

Please call Christina Vink, ATC, Program Coordinator at BDI or Jennifer Gamboa, DPT, OCS, President, BDI with questions or concerns.

703.527.9557

Short List:

1. Warm-up (0 to 2 minutes)
 - Jog line to line
 - Shuttle run sideways
 - Backward running
 - Grapevine runs
2. Stretching (2 to 7 minutes)
 - Calf
 - Quads
 - Hamstring
 - Inner Thigh (groin)
 - Hip flexor
3. Strengthening (7 to 11 minutes)
 - Walking lunges
 - Russian hamstrings
 - Planks
 - Calf raises
4. Plyometrics (11 to 14.5 minutes)
 - Lateral Hops
 - Forward/backward hops
 - Single leg hops
 - Vertical jumps (header prep)
 - Scissors jumps
5. Agilities (14.5 to 18.5 minutes)
 - Shuttle runs, forward/backward
 - Diagonal runs
 - Bounding runs
6. Cool Down (after practice)
 - Light jog
 - Stretches
 - i. Knee to chest
 - ii. Butterflies
 - iii. Piriformis

Field Set Up

