

**Center for Sports Rehabilitation**

**And Specialty Services**

**Train the Trainer Program: Developed for Belmont High School**

Goals:

1. Participants will be able to identify risky lower extremity mechanics that put the athlete at risk for ACL injury
2. Participants will be able to modify activities to improve the athletes mechanics
3. Participants will have a tool set of exercises to incorporate into practice sessions that can enhance the athletes overall fitness, reduce the risk of injury and improve mechanics
4. Participants will have basic knowledge of neck and shoulder girdle strengthening, as well as technique suggestions for heading the ball.

**Outline for August 21, 2012**

5:30-5:45 Introduction, discussion of goals

5:46-6:00 Consequences of ACL injuries…yes it is a big deal!

6:01-6:15 Trouble shooting: What are the concerns, barriers, areas of interest of the Coaches, Captains and ATC?

6:16-7:15 Incorporating warm up, dynamic warm up, strengthening, plyometrics, agilities and cool down into current practice outline

7:15-7:30 Wrap up/questions

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**Emerson Hospital Center for Sports Rehab and Specialty Services ACL Program**

Based off of *PEP (*Santa Monica Orthopedic & Sports Med Group) and *Sportsmetric* ™

**RED= PEP**

**BLACK=SPORTSMETRIC**

**PURPLE=BOTH PROGRAMS**

1. **Warm – up**: Warming up and cooling down are a critical part 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.
   1. **Jog line to line (cone to cone):** 
      1. 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.
      2. Instruction:  Complete a slow jog from near to far sideline
   2. **Shuttle Run (side to side):** 
      1. Purpose:  engage hip muscles (inner and outer thigh).  This exercise will promote increased speed. Discourage inward caving of the knee joint.
      2. \*\*Watch for bringing feet to close together (small BOS). Have them keep feet straight ahead (better alignment and can stop quicker.)
      3. Instruction:  Start is 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 half field.
   3. **Backward Running:** 
      1. 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.
      2. \*\*Tell athletes to stay low b/c it allows them to change directions quickly.
      3. Instruction:  Run backwards from sideline to sideline.  Land on your toes without extending the knee.  Stay on your toes and keep the knees slightly bent at all times.
   4. **Dynamic Stretches:**
      1. **Straight leg March** (Monster walks)
         1. Purpose: Provide athletes with mild hamstring stretch, while warming up hip musculature
         2. Description: Athlete should walk with both legs straight. Alternate bringing up each leg as high as possible without jeopardizing form. The knees should not bend and the body should not lean backward. Keep core tight and avoid thoracic kyphosis.
      2. **Inch worm** (Hand walk):
         1. Purpose: Provide athlete with mild stretch to hamstrings, calves, and back, while warming up the hip and shoulder muscles.
         2. Description: have athlete bend at waist and place palms on the ground. Body should be in upside-down “V” position, keeping back and legs straight. Athlete should walk using their hands and feet. Keep legs shoulder width apart.
      3. **Leg Cradle** (Cradle walk):
         1. Purpose: Provide athletes with mild stretch to hip musculature.
         2. Description: Walk forward, keeping the entire body straight. Lift one leg in front of the body, bending at the knee. Rotate the knee outward and the foot inward. Hold the raised foot with both hands; standing on one leg. Hold for a 3 second count and place it back down. Repeat with other leg.
      4. **Spiderman**:
         1. Purpose: Provide athletes with mild stretch and warm up to the hip musculature, including the groin and glutes.
         2. Description: Athlete should be in a push-up position and bring one foot up to or near the hand on the same side of the body. The foot should land on the outside of the hand, the other leg should stay elongated and the athlete should sink his hips during the movement. Switch legs to stretch the opposite side by crawling forward.
      5. **Knee Hug:**
         1. Purpose: Provide athletes with mild stretch and warm up to the hip musculature, including the glutes.
         2. Description: Athlete will hug there knee to their chest, allowing the calf and hamstring to touch. Make sure the athlete keeps there back straight and does not arch back. Lower the leg and walk forward repeating with opposite leg. Continue in an alternating fashion with each step.
      6. **Walk Heel to Butt:**
         1. Purpose: Provide athletes with mild stretch and warm up to quadriceps.
         2. Description: Athlete grabs one foot with the same arm and pulls the ankle and foot up, making contact with their buttocks. Lower leg and walk forward repeating with opposite leg. Continue in an alternating fashion with each step.
2. **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.
   1. **Walking Forward Lunges (1 minute):** 3x10 reps
      1. Purpose:  Strengthen the thigh (quadriceps) muscle.
      2. \*\* No anterior tibial translation
      3. 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 your keep your front knee over your ankle. Control the motion and try to avoid you front knee from caving inward.  If you can’t see your toes on your leading leg, you are doing the exercise incorrectly.
   2. **Steamboats:**
      1. Purpose: Provide dynamic strengthening of the hip flexor and extensor musculature, while providing stabilization strength training to the opposite leg.
      2. Description: Place the resistance band around the thighs, halfway between the hips and knees. Begin with feet shoulder width apart and then slightly bend on knee so that the foot is off the ground. Balancing on the other leg, begin kicking the bent leg forwards and backwards at the hip.
   3. **Lateral step with Band:**
      1. Purpose: Strengthen hip abduction and adduction
      2. Instruction: Place resistance band around thighs. Begin with feet shoulder width apart, and step out to the side ~2-3 ft. Slowly and under control, follow with the other foot to regain the ‘feet shoulder width apart’ position. Once finished switch directions.
   4. **Supine SL Hamstring Bridge/Bench Bridging (1 minute):** 3x10 reps
      1. Purpose:  Strengthen hamstring and glute muscles
      2. Instruction:  Lying flat on back, bend one knee and place the heel of the foot as close as possible to gluteus as possible. Extend the other leg straight into the air. Pushing with the heel that is on the ground, perform small lifts raising the gluteus off the ground.
   5. **Bridging with Alternating Hip Flexion (1 minute) (30 reps)**
      1. Purpose:  Strengthen outer hip muscles (Hip abductors, flexors) and buttocks
      2. Instruction:  Lie on the ground with your knees bent with feet on the ground.  Raise your buttocks up off the ground and squeeze.  Now, lift your right foot off the ground and make sure that your right hip does not dip down.  Lower your right foot and now lift your left foot making sure your left hip does not dip down.  Repeat 30 times on each side.  As you get stronger, you will place your feet on top of a ball and repeat the exercise.
   6. **Abdominal Crunches (1 minute)  (2 x 30 reps)** 
      1. Purpose:  Strengthen the abdominals (rectus abdominus, obliques)
      2. 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.
   7. **Modified Plank Position:**
      1. Purpose: increase core stabilization and strength.
      2. Instructions: begin lying face down, placing elbows under the shoulders and forearms on the ground. Place the legs hip distance apart and curl the toes under. Once set in this position, lift the body up onto the elbows and toes.
   8. **Single Toe Raises (1 minute):** 2x30 reps
      1. Purpose:  This exercise strengthens the calf muscle and increases balance.
      2. 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 30 times and switch to the other side.  As you get stronger, you may need to add additional repetitions to this exercise to continue the strengthening effect of the exercise.
3. **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 bent  hip.  These exercises are basic, however, it is critical to perform them correctly.  Please begin these exercise using a flat cone (2 inches) or with a visual line on the field. With the plyometric activities, have your younger athletes jump over a visual line on the field (midfield, end line, or sideline) or a flat 2” cone.  The emphasis of this activity is the landing technique – not the height of the object that the athlete is jumping over.    
     
   In addition, the younger athletes should perform the plyometric activities with a two-legged landing.  Again, the emphasis is on the landing and knee control (not allowing the knees to cave inward and bending the knees and the hips to accept the force of landing).  
     
   1. **Squat Jump:**
      1. **Purpose: teach athletes to generate power from a deep knee and hip flexion position.**
      2. **Instruction: Begin in squat position with proper knee and foot alignment, and hands reaching towards the ground at the outside of the heels. Jump up reaching overhead as high as possible. Torso and legs should extend fully on the jump.**
   2. **180 degree Jump:**
      1. **Purpose: teach athletes dynamic body and knee control by introducing a rotational component that must be decelerated and immediately redirected in opposite direction.**
      2. **Instruction: Start with feet shoulder width apart. Take off with feet, jumping up and then rotating body 180⁰ in midair. Torso and legs should extend fully during the jump. Upon landing repeat in opposite direction.**
   3. **Lateral Hops over Cone (30 seconds):** (20 reps)
      1. Purpose:  Increase power/strength emphasizing neuromuscular control
      2. Instruction:  Stand with a 2” 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.   Progress to DL to SL hops then SL to SL hops
   4. **Forward/Backward Hops over cone (30 sec):** (20 reps)
      1. Purpose:  Increase power/strength emphasizing neuromuscular control
      2. Instruction:  Hop over the cone softly landing on the balls of your feet and bending at the knee.  Now, hop backwards over the ball 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.
   5. **Single Leg hops over cone (30 seconds):** (20 reps)
      1. Purpose:  Increase power/strength emphasizing neuromuscular control.
      2. Instruction:  Hop over the cone landing on the ball of your foot bending at the knee.  Now, hop backwards over the ball 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.  Now, stand on the left leg and repeat the exercise.  Increase the number of repetitions as needed.
   6. **Vertical Jumps with headers (30 seconds):** (20 reps)
      1. Purpose:  Increase height of vertical jump.
      2. Instruction:  Stand forward with hands at your side.  Slightly bend the knees and push off jumping straight up.  Remember the proper landing technique; accept the weight on the ball of your foot with a slight bend to the knee.
   7. **Scissors Jump (30 seconds):** (20 reps)
      1. Purpose:  Increase power and strength of vertical jump.
      2. 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.
4. **Agilities:**
   1. **Forward run with 3 step deceleration:** 
      1. Purpose:  Increase dynamic stability of the ankle/knee/hip complex
      2. Instruction:  Starting at the first cone, sprint forward to the second cone.  As you approach the cone, use a 3 step quick stop to decelerate.  Continue on to cone 2 using the same strategy to deceleration.  Do not let your knee extend over your toe.  Do not let you knee cave inward.    This exercise is used to teach the athlete how to properly accelerate and decelerate while moving forward and the hip, buttock and hamstring musculature.
   2. **Lateral Diagonal runs (3 passes):** 
      1. Purpose:  To encourage proper technique/stabilization of the hip and knee.  This exercise will also deter a “knock knee” position from occurring – which is a dangerous position for the ACL.
      2. Instruction: Face forward and laterally run to the first cone on the right.  Pivot off the right foot and shuttle 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 hip and make sure the knee stays over the ankle joint.
   3. **Bounding run (44 yds):** 
      1. Purpose:  To increase hip flexion strength/increase power/spee**d**
      2. 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.
   4. **Quick Feet (Buzz Saw):**  Can use agility ladder.
      1. Purpose: provide athletes with drill that will teach them how to move in a lateral pattern quickly and efficiently by using short, choppy steps that do not waste injury by allowing feet to cross.
      2. Instruction: Start at end of straight line, lined up parallel to the line. Moving down the line, to the left, step the left foot forward and diagonally over the line followed quickly by the right foot. As soon as the foot crosses the line, step the left foot backward and diagonally back over the line, again followed by the right foot. Continue this pattern along the length of the line for 30 seconds.
   5. **Nebraska Agility Drill:**
      1. Purpose: teach athletes how to make quick, sharp cuts and directional transitions without jeopardizing proper running techniques.
      2. Description: Set up 2 cones 30’ apart from one another. Beginning on the right side of the 1st cone, sprint to the left side of the other cone. Put your right hand down to touch the cone and pivot around the cone until you are facing the first cone. Sprint to the right side of the 1st cone until you are facing the 2nd cone (completing a figure8 around the cones). Staying on the right side of both cones, and close to the cones, sprint forward to the 2nd cone. Upon reaching the 2nd cone, backpedal to the starting position.
5. **Cool Down:** 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).  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 strength training exercises.  In addition to those basic stretches, we are offering some additional stretches to target 3 muscle groups that are often forgotten.
   1. **Single and Double Knee to Chest (supine) (30 seconds x 2 reps)**
      1. Purpose:  Elongate the low back muscles
      2. Instruction:  Lie on your back.  Bring your right knee toward your chest and hug firmly.  Keep your left leg out straight in front of you.   You should feel a stretch along your low back and into your buttocks.  Hold the stretch for 30 seconds and switch sides.  Now bring both knees to chest.  If you feel any pain in the low back, discontinue the stretch and inform your coach/trainer.
   2. **Figure Four Piriformis stretch- supine (30 seconds x 2 reps)**
      1. Purpose:  Elongate the rotators of the hip.
      2. Instruction:  Lie on your back and bend both of your knees.  Fold your left ankle over your right knee.  Place your hands behind your right thigh and pull your right knee to chest.  You should feel a good stretch in the left gluteals region and the side of the thigh.  Hold for 30 seconds and repeat on the other side.  If you experience and low back pain with this stretch, slowly lower your legs down and let your coach/trainer know.
   3. **Hamstring Stretch:**
      1. Purpose: Elongate hamstring muscles.
      2. Description: While seated, extend right leg fully and bend left leg placing the inside of the left foot along the right calf. Keep the back straight and bend at the waist, until a stretch is felt. Hold for 30 seconds and repeat on the other side.
   4. **Hip Flexor Stretch:**
      1. Purpose: Elongate hip flexor muscles.
      2. Instruction: Stand with feet in lunge position with the front knee slightly bent. Push up on the rear toe and press the hips forward while tightening the buttocks until a stretch is felt in the front of the hip if the rear leg. Hold for 30 seconds and repeat on the other side.
   5. **Quad stretch:**
      1. Purpose: Elongate quad muscles.
      2. Instruction: While standing grab the foot or ankle of one leg and lift it up behind the body. Gently pull the lower leg and foot up, directly behind the upper leg, with no twisting inward or outward. Hold for 30 seconds and repeat on the other side.