



ACL Injury Prevention Program

Introduction:

This program is designed to apply techniques involving strengthening, flexibility, agility, plyometrics, proprioception, and overall body mechanics to the exercise programs of athletic teams in an effort to reduce the likelihood of ACL injuries.

How it works:

The program is designed to be completed within a 15 – 20 minute session, three times per week for a total of six weeks. This program should be completed at the beginning of a practice session and may be done in the existing warm-up time.

After the recommended team warm-up, athletes will rotate through the following three stations: strengthening, agility / plyometrics, and balance / proprioception. After completing a team warm-up, coaches will guide athletes in specific exercises at each station. Stations should last 5 minutes each and allow roughly one minute for rest and transition between each station. The role of the coaches will be to facilitate exercises, monitor the body mechanics of their athletes, and regulate flow as athletes rotate through stations. For maximum efficiency, it is recommended that there be a coach that manages the time for all three stations. A whistle or verbal directions to change stations from one person will allow for smooth transitions between stations.

For ease of implementing this program, it is designed to use minimal supplies. It is recommended that access to cones, a set of bleachers, and a stopwatch for each station are available for use.

The following is a list of exercises in the order that they should be completed at each station. Each exercise will include a purpose, instructions (with picture), guidelines for proper technique, and duration.

Warm-Up:

Warming up is a vital component of any exercise program. This prepares the body for the demanding tasks found in athletic activity as well as reduces the risk of injury.

logging:

Purpose: activates the muscles surrounding the ankle, knee and hip joints in preparation for activity.

Forward – 45 seconds

Monitor to ensure fluid transfer of body weight from **heel to toe** through the running phase. Strides should be moderate in length to ensure a good range of motion in the ankle, knee, and hip joints.

Backwards - 45 seconds

Keeping the trunk erect, monitor to ensure fluid transfer of body weight from **toe to heel** through the running phase. Strides should be moderate in length to ensure a good range of motion in the ankle, knee, and hip joints. Hips should extend backwards with each stride.

Grapevine - 45 seconds

This activity engages the same muscles as jogging with the addition of the muscles responsible for lateral and rotary motion of the legs and trunk.

Instruction: Facing one direction, jog sideways while alternating hip rotation such that the trail leg alternates whether it crosses in front or back of the body with each step.

Dynamic Stretching:

HS ball rolling – 45 seconds

Purpose: Provides a stretch of the hip hamstrings.

Instruction: Start by standing with the feet slightly wider than shoulder width, place a basketball between the legs. Keeping the legs straight, hinge forward at the waist until the athlete can grip the basketball with both hands. Roll the basketball in a figure eight pattern through the legs.

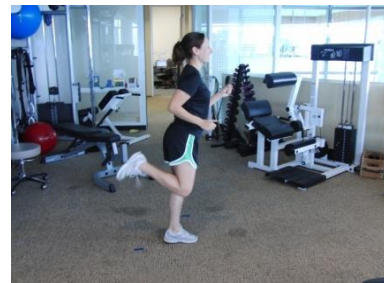
Technique: The athlete should feel a stretch in the hamstrings. Remind athletes to keep the knees straight for the duration of the exercise.

Butt Kicks - 45 seconds

Purpose: Activates hamstring while providing a stretch of the quadriceps.

Instruction: While in a short-stride jog, kick the foot back and toward the butt until the athlete either kicks the butt or feels a stretch of the quadriceps. Alternate feet and kick with each step.

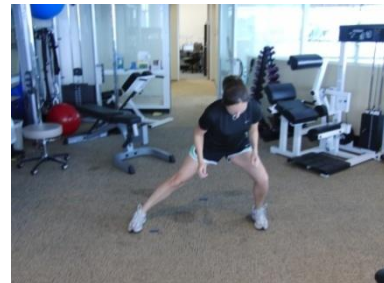
Technique: Start slow and work up to a pace of roughly two kicks per second.



Pivoting Lunge Stretch - 45 seconds

Purpose: Stretches the muscles of the inner thigh.

Instruction: Facing one direction, sidestep laterally until the feet are wider than shoulder width. From this position, squat down and transfer weight onto one leg while focusing on an inner thigh stretch of the other leg. Stand up on the weight bearing leg, pivot and repeat



stretch with the other leg and continue to alternate.

Technique: Avoid letting the knees come farther forward than the toes when squatting down.

High Knee Marches (with a wing) - 45 seconds

Purpose: Activate deep muscles in the hip joint while providing a stretch of the hip rotators.

Instruction: March forward driving the knee high toward the chest. Once the knee reaches its peak, rotate the hip laterally until the athlete feels a stretch in the inner thigh. Lower the leg in the outward position and immediately drive it up again and rotate the leg back across the body until the athlete feels a stretch on the outer hip. Repeat with the other leg.

Technique: Once this motion becomes familiar to the athlete, this should be a very fluid motion.

Emphasis should be placed on keeping the trunk erect and not hyperextending the weight bearing leg.



Station 1: Strength / Core:

Multi-Directional Lunge - 30 seconds in each of the 3 directions.

Total time: 1 minute 30 seconds.

Purpose: Strengthen the quadriceps and posterior hip musculature as well as provide dynamic stability to the knee joint and surrounding structures.

Instruction: Facing forward, lunge forward with one leg, lower until the back knee touches the ground. Drive upward using the quads in the front leg until the athlete is standing in the original position. Alternate legs with each lunge. Repeat



exercises at 45 degrees to the right and left side, as well as 90 degrees to each side.

Technique: At the lowest point in the lunge, the knee and hip should create a 90 degree angle. Avoid the knee coming farther forward than the toes. Most of the effort should come primarily from the forward leg in each lunge.



Planks – 30 seconds flat, 15 seconds each side

Total time: 1 minute

Purpose: Strengthen the muscles of the core and abdomen

Instruction: Facing the ground, place the forearms on the ground. Elbows should be directly below the shoulders. Raise the hips off the ground so that the back is flat. The body should be a straight line from the heels to the shoulders. Hold this position for 30 seconds. After 30 seconds, body to one side so that one shoulder and one leg support the body. After 15 seconds switch to the other side and hold.

Technique: The body should be as straight as possible. If the athlete is unable to support their body weight with their feet, this exercise may be completed using the knees.

Single Leg Eccentric Hamstring - 30 seconds per leg.

Total time: 1 minute.

Purpose: Strengthen the hamstring and provide dynamic stability to the knee and surrounding structures.

Instruction: From an erect single leg stance, hinge forward at the hips while driving the non-weight bearing leg backward and reaching toward the ground with both hands. Hinge to the point that the athlete feels a stretch on the hamstrings then hinge back up to a standing position.

Technique: Weight bearing leg should remain straight. Monitor athletes to avoid hyperextension of the knees.



V-Sit with Trunk Rotations - Two sets of 30 seconds

Total time: 1 minute (progress to 2 minutes as tolerated by athletes)

Purpose: Strengthens abdominal muscles and hip flexors to improve core stability.

Instruction: Begin by sitting on the ground. Rock back so that the feet and shoulders are together and elevated roughly one foot off the ground. With arms crossed across the chest, rotate the trunk from side to side.



Technique: Athletes may tend to rotate arms from side to side. Arms should be fixed on the trunk, and the trunk should be responsible for all the rotation. The goal will be to keep the knees as straight as possible during the exercise, but for beginners, the knees may need to have a slight bend to complete the exercise.

Station 2: Agility / Plyometrics

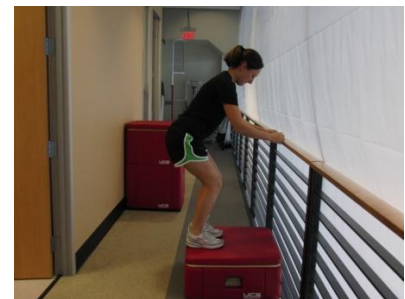
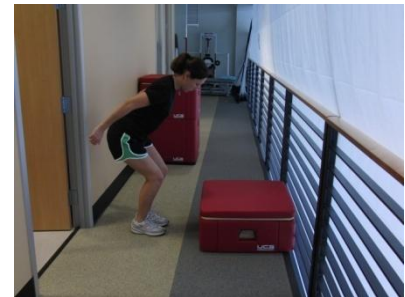
Bleacher Jumps - Two sets of 30 seconds

Total Time: 1 minute

Purpose: Increase strength and power through dynamic ranges of motion as well as increase control of body mechanics.

Instruction: At the base of a set of bleachers, start by jumping with two legs up a single step. Drive arms up and reach for the ceiling with each jump. Hold the landing position for a couple seconds before turning around to jump back down. Take a small double leg hop off the bleacher and focus on a quality landing position.

Technique: Forces should be absorbed with the toes and knees such that the landings are quiet. Avoid a “knocked-knee” position. Also, avoid bringing the knees farther forward than the toes.



Shuttle Run – One set forward and in a zig-zag pattern

Total Time: 1 minute

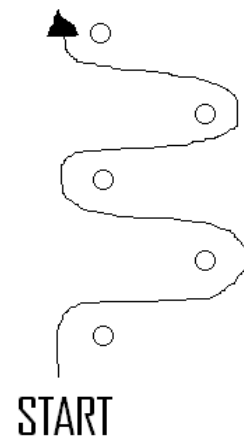
Purpose: Activates muscles of the lower body and strengthens them during high speed activities that involve a directional change.

Instruction: This is a sprint that is done in two different patterns; straight forward and a zig-zag pattern.

Forwards: Sprint from baseline to baseline and back, baseline to half court and back, and baseline to the free throw line and back.

Zig-zag: Set up cones (or available marker) in a zig-zag pattern between one baseline and half court. Athletes should sprint around the cones and jog back. Each athlete should sprint this pattern three times.

Technique: This is a high speed sprint that with a very high emphasis on proper running mechanics and form during directional changes. Linear



sprints should involve a high knee drive with toes high off the ground. Arm motions should be active during sprinting. Monitor the position of the knees during running. There may be a tendency to run in a “knock-kneed” position. This position places unnecessary stress on the knee joint. Attempt to queue the athlete to correct this knee position (especially during directional changes).

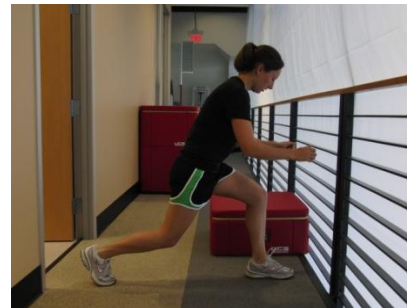
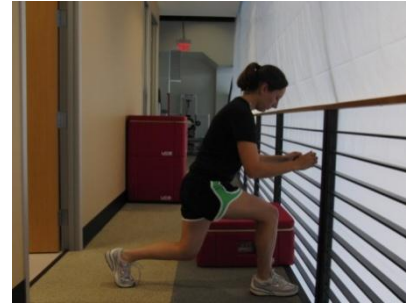
Scissor Squat Jumps – 45 seconds

Total Time: 45 seconds

Purpose: This activates the muscles around the knee and hip joints to strengthen and provide stability during activity.

Instruction: From a standing position, hop up slightly and drive one knee forward and the other leg back. Land in a lunge position. After reaching the base of the lunge, explode back upward and alternate legs.

Technique: At the bottom of the lunge, the front knee should create a 90 degree angle and should be no farther forward than the toes. The trunk should be erect and should also create a 90 degree angle with the thigh. The back knee should be directly below the hips and the toes should be on the ground.



Z-Jumps – 30 seconds each leg

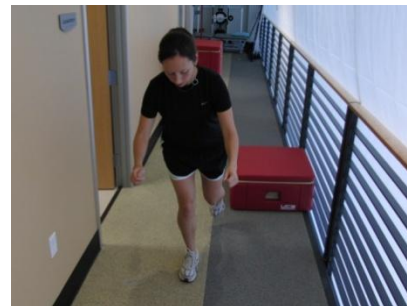
Total Time: 1 minute

Purpose: This activates the muscles of around the knee and hip joints to strengthen and provide stability during activity.

Instruction: Standing on one leg, perform small hops in a pattern that would draw the letter “Z” with each point of contact.

Retrace this pattern with on each leg for the duration of the exercise.

Technique: The primary source of contact should be the toes. Monitor knee position to look for lateral deviations of the knee. Also remind athletes that the toes should not come farther forward than the toes.



Station 3: Balance / Proprioception

Single Leg Calf Raises – 30 seconds on each leg

Total Time: 1 minute

Purpose: Strengthens calf muscles while improving balance. This translates well to the take-off and landing phase of jumping.

Instruction: Standing on one leg. Raise heel off the ground until standing on the balls of feet. Hold for 5 seconds and come down slowly.

Technique: Trunk should be erect and head should be facing straight forward. Monitor athletes that may be hyperextending their knees.



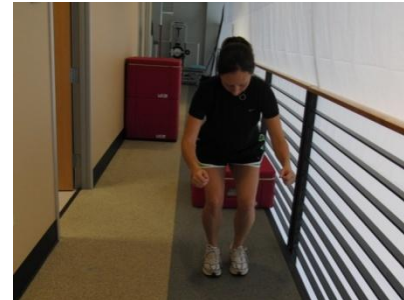
Square Jumps – 1 minute

Total Time: 1 minute

Purpose: Increase stability of the knee joint during jumping activities by strengthening surrounding musculature.

Instruction: Athletes will be performing a double leg jump in a square box pattern. Each jump should be roughly two feet in length. Starting at one corner of the square, the athlete will jump to four points in a pattern that creates a square. Each jump should be held for 10 seconds in the squat position before initiating the next jump.

Technique: Keep feet together and land softly on the toes. Loud landings may indicate unnecessary forces through the legs. When holding the squat position, monitor the knees to make sure they do not come farther forward than the toes.



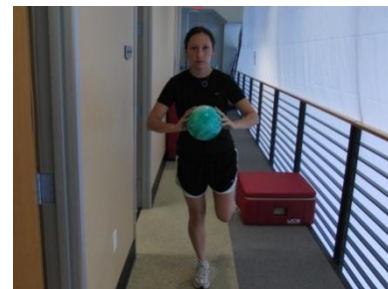
Single Leg Ball Toss – 30 seconds on each leg

Total Time: 1 minute

Purpose: Increase balance in activities specific to basketball.

Instruction: This is a partner exercise. Two athletes should face each other while standing on one leg. Athletes may perform passing drills while working on maintaining their balance.

Technique: Monitor knee position to avoid hyperextension. The trunk should be upright as well.



Broad Jump – 1 minute

Total Time: 1 minute

Purpose: This activates the muscles of around the knee and hip joints to strengthen and provide stability during activity.

Instruction: Standing with feet at shoulder width apart, explode forward and land in a squat position. Hold this position for 10 seconds. Explode from this position into the next broad jump.

Technique: In the squat position, the knees should not be farther forward than the toes. Landings should be soft and quiet. Landing should start with a heel strike and roll to a flat foot position.



Exercise Summary:

Warm-Up:

Logging:

Forward – 45 seconds
Backwards - 45 seconds
Carioca - 45 seconds

Dynamic Stretching:

Figure Eight Hamstring - 45 seconds
Butt Kicks - 45 seconds
Lateral Lunge Stretch - 45 seconds
High Knee Marches (with a wing) - 45 seconds

Station 1: Strength / Core:

Multi-Directional Lunge - 30 seconds in each of the 3 directions.

Total time: 1 minute 30 seconds.

Planks - 1minute

Total time: 1 minute

Single Leg Eccentric Hamstring - 30 seconds per leg.

Total time: 1 minute.

V-Sit with Trunk Rotations - Two sets of 30 seconds

Total time: 1 minute (progress to 2 minutes as tolerated by athletes)

Station 2: Agility / Plyometrics

Bleacher Jumps - Two sets of 30 seconds

Total Time: 1 minute

Shuttle Run – One set forward and in a zig-zag pattern

Total Time: 1 minute

Scissor Squat Jumps – 45 seconds

Total Time: 45 seconds

Z-Jumps – 30 seconds each leg

Total Time: 1 minute

Station 3: Balance / Proprioception

Single Leg Calf Raises – 30 seconds on each leg

Total Time: 1 minute

Square Jumps – 1 minute

Total Time: 1 minute

Single Leg Ball Toss – 30 seconds on each leg

Total Time: 1 minute

Broad Jump – 1 minute

Total Time: 1 minute