

Kitsap Youth Sports

Lower Extremity Injury Reduction Program

This program contains exercises including warm-up, flexibility, strengthening, plyometrics and agility drills designed to enhance the athlete's sport performance, as well as reduce the risk of injury. These activities are geared toward development of the lower extremities and core, most specifically with regard to knee stability and protection of the anterior cruciate ligament (ACL).

The ACL is one of the main ligaments providing stability to the knee. It reduces the distance the tibia slides forward under the femur, and also provides rotational stability to the knee.

An ACL injury most commonly occurs during sports involving sudden stops and/or changes in direction — such as basketball, soccer, football, tennis and volleyball. If your sport involves running, pivoting, or jumping, a proper training program may help reduce your chances of an ACL injury.

Current research suggests ACL injuries can occur from player to player contact, though many ACL tears happen from non-contact activities as well. Women are at a higher risk than male athletes, with literature stating females are approximately 6x more likely to sustain an ACL tear.

Despite decades of research and clinical emphasis on the ACL, a complete understanding of the injury mechanism, optimal treatment plan, and best rehabilitation protocol continue to stimulate great debate. Injury prevention/reduction programs have been admirable, however there continue to be far too many young athletes falling victim to this injury sidelining their true athletic potential.

As with initiating any exercise program, be aware of the risk(s) of increased exercise intensity and symptoms associated with this. It may be beneficial to be under the supervision of a qualified medical professional. This program is NOT intended to replace appropriate strength and conditioning programs, rather provide additional “fine tuning” to optimize the athlete's ability to perform a particular sport activity more safely.

This program was adapted from the PEP program

Warm Up

Approximately 2 minutes

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.

A. Jog line to line

30 seconds

Purpose - Allows the athletes to slowly prepare themselves for the training session while minimizing the risk for injury.

Good: Keep hip, knee and ankle in straight alignment

Bad: Whipping feet out to sides



B. Shuttle Run

30 seconds

Purpose - Engage hip muscles (inner and outer thigh). This exercise will promote increased speed.

Good: Maintain athletic stance throughout exercise

Bad: Standing up tall, letting feet click, bringing knees together



C. Backwards Running

30 seconds

Purpose - Engage hip extensors and hamstring muscles.

Good: Landing on toes, maintaining slightly bent knee, maintain athletic stance

Bad: Fully extending knees, landing on heels, knees pointing inward



Strengthening

Approximately 3 minutes

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

1 minute

Purpose - Strengthening of the thigh (quadriceps) muscles.

Good: Keep front knee over the ankle, keep the motion controlled

Bad: Knee caving inward, if you can't see your toes on your leading leg



B. Russian Hamstring

1 minute (30 seconds per partner)

Purpose - Strengthening of the hamstring muscles.

Good: Knee, hip and shoulder in straight line

Bad: Bending at the waist



C. Single Toe Raises

1 minute (30 seconds per leg)

Purpose - Strengthening of the calf muscles and increases balance

Good: Bending opposite knee up, maintaining balance, slowly rising onto toes and back down

Bad: Severe wobbling, moving too quickly



Plyometrics

Approximately 3 minutes

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 exercises using a flat cone (2 inches) or with a visual line on the field.

A. Lateral Hops Over Cone

30 seconds

Purpose - Increase power and strength while emphasizing neuromuscular control

** Start with double leg hops and progress to single leg hops **

Good: Landing softly on balls of feet, bending at the knee

Bad: Landing hard on feet, landing with straight knees and hips



Double Leg



Single Leg

B. Forward/Backward Hops Over Cone - Double Leg & Single Leg

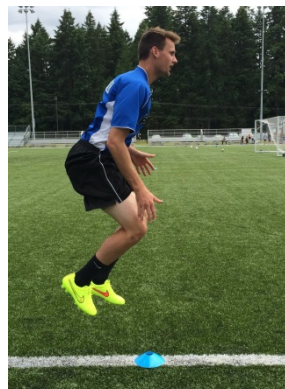
1 minute total:

(30 seconds double leg, 15 seconds per single leg)

Purpose - Increase power and strength while emphasizing neuromuscular control

Good: Landing softly on balls of feet, bending at the knee

Bad: Locking knees out straight, snapping knees back to straighten, knees moving inward towards each other



Double Leg



Single Leg

Plyometrics - Continued

C. Vertical Jumps With Headers

30 seconds

Purpose - Increase height of vertical jump.

Good: Land with weight on ball of foot, slight bend to knees

Bad: Not landing softly on balls of feet, landing with knees inward towards each other



D. Scissors Jump

30 seconds

Purpose - Increase power and strength of vertical jump

Good: Keep knee stable and directly over ankle, keep soft landing technique

Bad: Knees caving in or out, not landing softly on the balls of the feet



Agility

Approximately 3 minutes

These exercises are performed to enhance stopping /starting/pivoting/cutting motions while maintaining lower body stability.

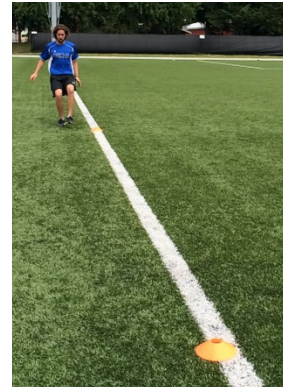
A. Forward Run With 3-Step Deceleration

1 minute

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

Good: Keep body in line, keep knees behind toes

Bad: Knees caving inward, knees extending over toes



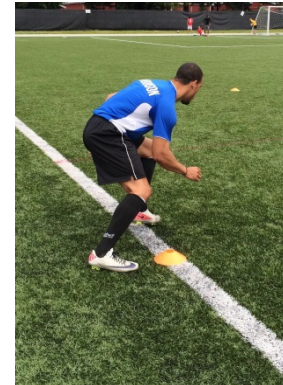
B. Lateral Diagonal Runs (3 passes)

1 minute

Purpose - To encourage proper technique/stabilization of the hip and knee

Good: Keep slight bend to knee and hip, pivoting off foot, keeping core tight

Bad: Knees caving inward, twisting trunk instead of pivoting



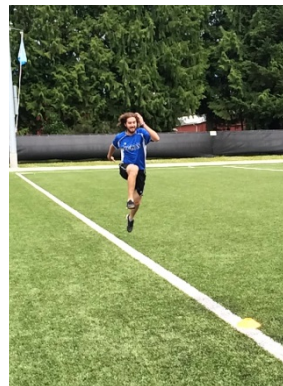
C. Bounding Run (44 yds)

1 minute

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

Good: Bringing knees straight up towards chest, landing on ball of foot, keeping knee and hip aligned

Bad: Knees caving inward during landing, not bringing knees up high during "bounding"



Stretching

Approximately 5 minutes

It is important to incorporate a short warm-up prior to stretching. Never Stretch a “cold muscle”. By performing these stretches, 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.

A. Calf Stretch

1 minute (2 x30 second holds)

Purpose - Stretching of the calf muscle (back of lower leg)

Good: Bending forward at the waist

Bad: Knees caving inward, knees extending over toes



B. Quadriceps Stretch

1 minute (30 second hold each side)

Purpose - Stretching of the quadriceps muscle (front of thigh)

Good: Knee pointed towards the ground, keeping legs close together

Bad: Legs winging out to the side, bending at the waist.



C. Figure Four Stretch

1 minute (30 second hold each side)

Purpose - Stretching of hamstring muscles

Good: Keep back straight

Bad: Rounding the back, bouncing



Stretching - Continued

D. Inner Thigh Stretch

1 minute (2x30 second hold)

Purpose - Stretching of inner thigh muscles

Good: Keep back straight

Bad: Rounding the back, bouncing



E. Hip Flexor Stretch

1 minute (2x30 second hold)

Purpose - Stretching of hip flexor muscles

Good: Maintain balance, hips square with shoulders

Bad: Wobbling, hips swaying

