What You Need to Know About ACL Prevention

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What is an ACL Tear?

The ACL (anterior cruciate ligament) is the main anterior stabilizer of the knee. It is a strong ligament inside your knee that allows you to be able to turn, cut, twist and pivot. While a torn ACL used to be an injury exclusive to athletes, with today's active lifestyles it is becoming more common in any age group and at various activity levels. There may also be other structures in your knee that are injured at the same time. These may include your meniscus (fibrocartilage cushion in your knee), or other ligaments. The treatment plan will be influenced by what structures are involved, your current activity level, and what your desired activity level will be. The final plan of care will be decided upon by you and your doctor.

There are four ligaments that connect the knee joint. The best known of these ligaments is the Anterior Cruciate Ligament or ACL. The ACL connects the Tibia, a bone of the lower leg to the Femur, the bone of the upper leg. It prevents the Tibia from sliding (translating) too far forward from the Femur.

The ACL is especially crucial in sports where it provides stability during stop/go/pivot motions (basketball, football, and soccer). Most injuries to the ACL occur when an individual makes a sudden cut or turn and the foot stays planted on the ground. Injuries can also take place when landing improperly from a jump (Volleyball & Basketball).

Signs and Symptoms:
- Immediate Swelling
- Pain
- Often a “pop” is heard
- Pain with walking
- Pain bending the knee
- Feeling of instability

An injury to the ACL may require surgery followed by an aggressive rehabilitation program for a healthy return to high levels of activity. If you suspect that you have injured your knee, seek out a qualified physician for an evaluation.

Strengthening

Single Leg Calf Raises
Stand on one foot and slowly raise up onto ball of foot and then back down. Repeat 10 times each side. Be sure to move up and down, not forward.

Forward Lunge
Take large step forward and slowly lower body toward the ground. Keep your knee directly over your toes. Repeat 10 times each side. Make sure to keep your knee over your toes when performing lunge. Make sure to keep your torso straight when lowering body.
Side Plank
Lie on either side with legs outstretched. Lower elbow on floor in line with shoulder. Tighten your stomach muscles. Lift your hips off the floor until your legs and upper body are in line. Hold 20 seconds. Repeat 2 times each side.
Make sure shoulder is positioned over elbow on the floor. Keep legs and torso straight and place upper arm against side.

Assisted Russian Hamstring Curl
Start on your knees with arms crossed over your chest and your partner holding your feet. Keeping your body straight, slowly lower your torso towards floor and return to upright position. Repeat 20 times.
Be sure to tighten your stomach while moving forward and back. Make sure not to arch back when returning to start position.

Our Program
Research indicates there will be an estimated 200,000 Anterior Cruciate Ligament (ACL) tears this year. Most will happen to female athletes. Some clinicians have tried to determine why women are more susceptible and have proposed several “risk factors” which may cause greater frequency of injury. It appears that an instantaneous loss of motor control, in combination with landing with knees and hips straight, are the major factors. Fortunately, research is also starting to show that a dedicated program with the right components can reduce this risk.

With this in mind, we have developed our own program. It was adapted from the Cincinnati Children’s Sports Medicine Biodynamics Center Program, The Human Performance Laboratory PEP Program in California, and other current research. These programs were combined and modified to accommodate the time available at team practices. Our goal was to simplify the exercises and enable each athlete to perform them with very little equipment.

Our Program Components are:
- Warm up
- Stretches
- Agility drills
- Practice
- Strength exercises
- Cool down

The components are listed in the recommended order to be part of each regular practice session. Warm up and stretches are completed before practice, followed closely by agility drills. Athletes should then be ready for practice. At the end of the session, continue with a brief strengthening period and end with your regular cool down exercises.

Adopting this routine at each practice should help reduce ACL injuries. We hope that it will enable each of your athletes to successfully participate all season.
Warm Up

Warm up is designed to get ready for practice activity and to help prevent injury. Set up two markers about 10 to 20 yards away from each other. Have players do the following three warm up activities for about two minutes each.

**Forward Jogging**

Jog forward from cone to cone. Hips, knees and ankles should be in alignment.

Make sure knees are not falling in toward each other and feet are not moving out to the sides behind them.

**Side Shuffling**

Shuffle sideways between cones.

Make sure knees and hips are kept in the bent position and don’t travel standing straight up.

**Backward Jogging**

Jog backwards from cone to cone. Hips, knees and ankles should be in alignment. Do not allow knees to fall inward.

Stay on your toes and do not jog flat footed.

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**Strengthening**

**Bridging**

Lie flat on back with both knees bent and feet flat on floor. Slowly raise buttocks from floor keeping stomach muscles tight throughout motion. Hold for 5 seconds. Repeat 10 times.

Make sure knees and hips are aligned. Make sure your body is flat from knees to shoulders.

**Single Leg Bridge**

Lie flat on back with knees bent, feet close together and flat on the floor. Slowly raise buttocks from floor keeping stomach muscles tight throughout motion. In the up position, slowly lift one foot (keeping stomach tight). Return foot to floor. Repeat with opposite foot. Repeat 10 times each side.

Make sure knee and hip of grounded leg are aligned. Make sure stomach is tight. Make sure your body is flat from knee to shoulder.

**Front Plank**

Position yourself in a “push-up” start position with your elbows on the floor in line with shoulders. Tighten your stomach. Lift your hips off the floor until your legs and upper body are in line with shoulders over elbows.

Make sure to keep legs and torso straight. Make sure back is not arched or curved downward. Hold 20 seconds. Repeat 2 times.
### Agility

**Single Tuck Jump**
Stand on ground with feet approximately shoulder width apart. Jump into the air while bringing knees up toward chest and hitting knees with the palm of your hands. Be sure to land softly on balls of feet with knees slightly bent. Try to bring thighs parallel to ground. Perform 10 times.
Do not land off balance. Do not land heels or with knees straight.

**Lateral Jumps**
Stand with feet slightly apart. Push off the ground with plant leg while moving in a sideways direction. Land on opposite foot. Hold 2 seconds then repeat with other leg. Perform 10 times each leg.
Make sure knee does not fall into midline of body on explosion. Make sure knee stays in a forward direction with a slight bend.

**Diagonal Jumps**
Stand with feet together. Explode off the ground with plant leg while moving in a diagonal direction. When foot hits the ground, explode again with the other foot going in a diagonal direction. Repeat 10 times each leg.
Make sure to use plant leg to push off the ground and really take off. Do not allow knee to fall in toward midline while landing.

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### Stretching

**Calf Stretch**
Stand on your right leg. Bend forward and put your hands on the ground in a V-form. Keep your right leg straight and your right foot flat on the ground. Bend your left leg and place your left ankle across your right calf. Hold this position for 30 seconds. Switch legs and repeat on your left side. Perform 3 repetitions on each leg.
Do not bend the stance leg, lean forward in the pushup position, arch your back or raise up on your toes.

**Quadriceps Stretch**
Stand tall with your weight evenly distributed. Bend your left knee, reach behind with your left hand and grab the front of your left ankle. Bring your heel up to your buttock and keep your left knee pointed towards the ground. Keep your left leg close to your right leg. Hold for 30 seconds and repeat on your right side. Perform 3 repetitions on each leg.
Do not bend at the waist or let your knee “wing” out to the side.

**Hamstring Stretch**
Sit on the ground with your left leg extended out in front. Bend your right knee and place the sole of your shoe on your left inner thigh. Keep your back straight and try to bring your chest to your left knee. Reach towards your left toes and pull them toward your head. Hold for 30 seconds and repeat with right leg. Do not round your back or bounce. Perform 3 repetitions on each leg.
Inner Thigh Stretch
Sit on the ground and spread your legs evenly apart. Keeping your back straight, reach overhead with both hands. Then slowly reach toward your right foot with both hands. Hold the stretch for 30 seconds and then repeat the stretch on the left side. Perform 3 repetitions on each leg.

Do not round your back, lean forward too fast or bounce.

Hip Flexor Stretch
Lunge forward leading with your left leg and kneeling with your right knee. Rest your left arm on your left thigh and lean forward with your hips. Keeping your balance, reach back for your right ankle and pull your heel to your buttocks. Hold the stretch for 30 seconds and repeat the stretch on the opposite side. Perform 3 repetitions on each leg.

Make sure to maintain your balance and keep your hips square with your shoulders.

Single Leg Touches
While standing on one leg with a ball on the ground in front of you, slowly reach down with one hand and touch the ball. Repeat 10 times on each side.

Do not allow balance knee to fall in toward the midline of body. Keep knee in a slightly bent position.

Single Leg Sport Specific
Stand on one leg and balance while performing soccer kicks with the other or dribbling basketball while balancing. Perform 1-2 minutes on each leg.

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Squat Jump with Hold
Stand on ground with feet approximately shoulder width apart. Perform a quick squat and then explode into a jump. Hold the landing for a 2 count. Perform 20 times.

Do not land on heels with knees straight! When landing make sure to land softly on balls of feet keeping your knees slightly bent and pointing straight forward.
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Cool Down

You can choose to do the warm-up section again with the forward jogging, side shuffling, or backward jogging. You can also choose to jog forward around the field for a couple of minutes. You can also choose to do the stretching exercises again. The point of the cool down is to relax all the muscles you just worked out. It is an important part of the program. Your muscles need time to recover from physical activity to be at maximum performance level.