



Incorporating an in-season leg strengthening and conditioning program to help performance and prevent sports injuries

The ability to properly cut, run, jump, land and decelerate in soccer is important to prevent knee injuries, particularly anterior cruciate ligament (ACL) injuries. There are more than 400,000 ACL injuries annually with a disproportionate number occurring in females—as much as 2 to 5 times higher than their male counterparts. ACL injuries are a major concern because of the growing numbers of injuries affecting young athletes; rising treatment costs; lost time from sport for treatment and recovery; the permanence of



the injury and surgery, and the associated development of early knee arthritis. In response to the ACL injury epidemic, a great deal of research has been focused on how and why ACL injuries occur and the best methods of prevention.

Most do not realize that ACL injuries occurring with sports are typically a “noncontact” injury—occurring without any external contact to the knee. In fact, the common cause seems to be a cutting, stopping, landing or another decelerating maneuver on a planted, single leg with a slightly bent knee in a “knock-kneed position” and possibly internal rotation of the lower leg. With

the knee in this position, it appears the landing forces combined with the athlete’s own muscle forces are responsible for damaging the ACL as they work to stop with the planted foot.

Factors such as the playing surface, shoe surface and weather also can contribute to the likelihood of an injury, with higher rates occurring in conditions with higher friction between the playing surface and the shoe. Other important contributing factors are the athlete’s anatomy and patterns of neuromuscular control. Also, athletes with specific anatomical differences in the size and shape of their joint surface, or differences in muscle activation patterns are at a higher risk for an ACL injury. Anatomical factors are not easily correctable, but patterns of movement can be modified with specific ACL prevention exercise programs. Exercises that improve cutting, landing and stopping mechanics at the knee, improve strength and endurance and address core balance and agility have proven helpful. Unfortunately, most of these successful programs are off-season regimens that, like all exercise programs, quickly lose their benefit once they stop leaving the athlete most vulnerable to injury during the season when their exposure is the highest.

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Incorporating an in-season program

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Based on his research and expertise, Dr. Steven Chudik, orthopaedic surgeon, sports medicine physician and founder of the Orthopaedic Surgery and Sports Medicine Teaching and Research Foundation (OTRF), strongly suggests athletes maintain their off-season training benefits throughout the soccer season to decrease their risk for injury, particularly ACL injury. This in-season exercise program, designed with the help of Keith Tesch, CSCS, CNT, and Larana Stropus, MS, ATC/L, is simple but sufficiently efficient to fit into the regular season practice schedule. Incorporating plyometrics, agility, single leg strength, core and flexibility exercises into regular practice, better prepares athletes to compete at their best and helps minimize the risk for injury.

Important Notice

Not all exercises are suitable for everyone. Consult your physician before beginning this or any other exercise program. Also, always warm up for several minutes before beginning any workout and **NEVER** exercise beyond the level at which you feel comfortable. If at any time you feel you are exercising beyond your current fitness abilities, or feel discomfort, discontinue exercise immediately and reconsider your participation in this program.

The in-season soccer maintenance program provided in this publication should not be attempted by anyone who does not meet minimum fitness requirements or who has a history of hip, knee, ankle, shoulder, elbow, wrist or spinal (neck or back) problems. **THIS WARNING IS NOT TO BE DISCOUNTED.** There are many other fitness alternatives if you have weaknesses or are prone to injuries. The user assumes all risks of injury in the use of this program.



Recommended Training Weeks 1-4

Warm-Up Exercises	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Forward Lunge Seated Hamstring	10 yards	1	Rest in line	Every day
Side Lunge High Knee Crossover	10 yards	1	Rest in line	Every day
Inchworm Rotation	10 yards	1	Rest in line	Every day
Shuffle	10 yards (down and back)	2	Rest in line	Every day

Core Exercises	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Plank Leg Lift	Hold 30 seconds	3 (alternate sides)	30 seconds	3 days
Side Plank (on elbow)	Hold 30 seconds/side	3 (alternate sides)	30 seconds	3 days

Strength Exercises	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Tuck Jump	30 seconds (about 20 repetitions)	2	30 seconds	Every other
1-Leg Toe Touch	30 seconds (about 15 repetitions)	2 (alternate sides)	30 seconds	3 days
Kneeling Nordic Hamstring*	5 repetitions	2	1 minute	1 day

***Caution:** Performing this exercise in-season without sufficient pre-conditioning and time to recover (more than 2 days) before the next competition, practice, etc., may over train the hamstrings and cause an injury.



Recommended Training Weeks 5-8

Warm-Up Exercises	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Forward Lunge Seated Hamstring	10 yards	1	Rest in line	Every day
Side Lunge High Knee Crossover	10 yards	1	Rest in line	Every day
Inchworm Rotation	10 yards	1	Rest in line	Every day
Shuffle	20 yards (down and back)	2	Rest in line	Every day

Core Exercises	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Plank (alternate arm row)	15 reps each arm	3	30 seconds	3 days
Side Plank (on hand)	Hold 30 seconds/side	3 (alternate sides)	30 seconds	3 days

Strength Exercises	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Tuck Jump	30 seconds (about 20 repetitions)	2	30 seconds	Every other
1-Leg Toe Touch (for speed)	30 seconds (about 15 repetitions)	2 (alternate sides)	30 seconds	3 days
Kneeling Nordic Hamstring*	5 repetitions	2	1 minute	1 day

***Caution:** Performing this exercise in-season without sufficient pre-conditioning and time to recover (more than 2 days) before the next competition, practice, etc., may over train the hamstrings and cause an injury.



Remainder of the Season Weeks 9+

Warm-Up Exercises	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Forward Lunge Seated Hamstring	10 yards	1	Rest in line	Every day
Side Lunge High Knee Crossover	10 yards	1	Rest in line	Every day
Inchworm Rotation	10 yards	1	Rest in line	Every day
Shuffle (change on whistle)	4 whistle blows (10 yards distance or coach's discretion)	2	Rest in line	Every day

Core Exercises	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Plank (opposite arm/leg lift)	3—10 second holds per side	3 (alternate sides)	30 seconds	3 days
Side Plank (leg lift)	Hold 60 seconds/side	3 (alternate sides)	30 seconds	3 days

Strength Exercises	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Tuck Jump Repeats	30 seconds (about 20 repetitions)	2	30 seconds	Every other
1-Leg Toe Touch Kick	30 seconds (about 10 repetitions)	2 (alternate sides)	30 seconds	3 days
Kneeling Nordic Hamstring*	5 repetitions	2	1 minute	1 day

***Caution:** Performing this exercise in-season without sufficient pre-conditioning and time to recover (more than 2 days) before the next competition, practice, etc., may over train the hamstrings and cause an injury.



Warm-Up Exercise

Forward Lunge into Seated Hamstring Curl

(Weeks 1-9+)

Warm-Up Exercise	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Forward Lunge into Seated Hamstring Curl	10 yards	1	Rest in line	Every day



1. Raise both arms overhead.
2. Place your right foot forward and perform a front lunge. Remember to keep your right knee behind your toes.
3. Place both hands down on each side of the right heel.
4. Slowly begin to shift all your body weight to the rear leg as the front leg straightens.
5. Stand up and switch legs. Continue the exercise for 10 yards alternating legs.

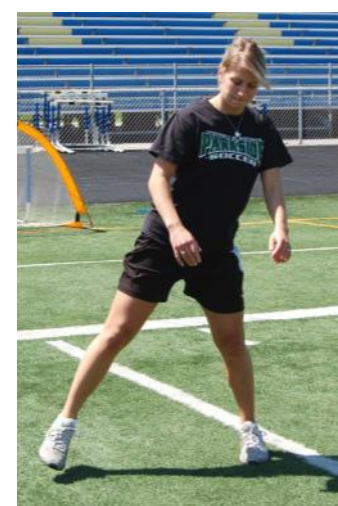


Warm-Up Exercise

Side Lunge High Knee Crossover

(Weeks 1-9+)

Warm-Up Exercise	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Side Lunge High Knee Crossover	10 yards	1	Rest in line	Every day



1. Begin in a straddle stance.
2. Progress into a side lunge by bending the right knee and extending the left. Be sure to keep the knee behind the toes during the side lunge.
3. Bend your left knee and raise it to waist level, then cross it in front of your right leg.
4. Begin to shift your body weight over your right leg while straightening your left leg.
5. Return to a straddle-stance and repeat the exercise pattern for 10 yards (30 feet).
6. Switch directions and repeat on the opposite leg for 10 yards (30 feet) to complete one set.



Warm-Up Exercise

Inchworm Rotation

(Weeks 1-9+)

Warm-Up Exercise	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Inchworm Rotation	10 yards	1	Rest in line	Every day



1. Bend at the waist and place both hands on the ground.
2. Keep both feet planted on the ground and slowly begin to walk both hands forward until you are in a plank position.
3. Once in a full plank, rotate your left hip toward the right side. Your chest should be perpendicular to the ground. Remember to maintain a neutral spine. Once balanced, slowly raise your right arm toward the sky.
4. Hold that position for 1 to 2 seconds, then return back to the plank position.
5. Slowly begin to walk your feet toward your head. Do not move your hands. Make sure to keep your hands in their original position.
6. Bring your feet as close to your hands as possible without bending your knees or lifting your hands off the ground.
7. Repeat the exercise for 10 yards (30 feet) alternating hip rotation from left side to right side.



Warm-Up Exercise

Shuffle

(Weeks 1-8)

Warm-Up Exercise	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Shuffle	10 yards—Weeks 1-4 20 yards—Weeks 5-8 (down and back)	2	Rest in line	Every day



1. Stand with both feet approximately shoulder-width apart and your knees slightly bent.
2. Your arms can remain at your sides, or in front for balance. Maintain this position throughout the exercise.
3. Beginning with your left leg, side shuffle to the left 10-20 yards (30-60 feet), then repeat the exercise to the right to complete one set.



Warm-Up Exercise

Shuffle Change on a Whistle

(Weeks 9+)

Warm-Up Exercise	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Shuffle (change on a whistle)	4 whistle blows (10 yards distance or coach's discretion)	2	Rest in line	Every day



1. Stand with both feet approximately shoulder-width apart and your knees slightly bent.
2. Your arms can remain at your sides, or in front for balance. Maintain this position throughout the exercise.
3. Beginning with your left leg, side shuffle to the left until a whistle is blown (10 yards or coach's discretion for distance).
4. Stop and switch your shuffle direction.
5. Continue in the new direction until the next whistle blow signaling you to stop and change your shuffle direction.



Core Exercise

Plank

(Weeks 1-4)

Core Exercise	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Plank	Hold 30 seconds	3	30 seconds	3 days



1. Begin in the plank position as shown with your hands shoulder-width apart and directly under your shoulders.
2. Slowly lower your entire body to the ground. Maintain a straight spine throughout the exercise.
3. Using your arms, push yourself off the ground returning to the plank position.
4. Hold for 30 seconds, then lower yourself and repeat.



Core Exercise

Side Plank on Elbow

(Weeks 1-4)

Core Exercise	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Side Plank (on elbow)	Hold 30seconds per side	3 (alternate sides)	30 seconds	3 days



1. Lay on your left side and assume the plank position as shown. Make sure to align your head, shoulders, hips and ankles into a straight line.
2. While maintaining the plank position, raise your body so your hips do not touch the ground. Hold that position for 30 seconds.
3. Return to the starting position and repeat the exercise two more times, then change to your other side and repeat.



Core Exercise

Plank Alternate Arm Rows

(Weeks 5-8)

Core Exercise	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Plank Alternate Arm Rows	15 repetitions each arm	3 (alternate sides)	30 seconds	3 days



1. Assume the plank position as shown above.
2. While maintaining the plank position, bend your right elbow and lift your hand off the ground.
3. Hold the position for 1-2 seconds, then return to the starting position.
4. Repeat the exercise with your left arm to complete one repetition.
5. Perform 15 repetitions to complete one set.



Core Exercise

Side Plank on Hand

(Weeks 5-8)

Core Exercise	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Side Plank on Hand	Hold 30 second per side	3 (alternate sides)	30 seconds	3 days



1. Begin the exercise by laying on your left side.
2. Align your shoulder, knees and ankles into a straight line.
3. Slowly raise your body off the ground using your left arm to push yourself up and act as your support base. Make sure your left arm is aligned directly under your shoulder.
4. Keep your body straight throughout the exercise and your feet stacked on top of each other. Avoid rotating your hips forward/backward.
5. Hold for 30 seconds, then slowly lower yourself back to the ground.
6. Repeat two more times, then change sides.



Core Exercise

Plank Opposite Arm/Leg

(Weeks 9+)

Core Exercise	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Plank Opposite Arm/Leg	3—10 second holds per side	3 (alternate sides)	30 seconds	3 days



1. Assume the plank position as shown.
2. While maintaining the plank position, raise your **left arm** and **right leg** at the same time.
3. Return to the starting position and repeat the exercise with your **right arm** and **left leg**.
4. Maintain a neutral spine and tucked chin throughout the entire exercise.



Core Exercise

Side Plank Leg Lift

(Weeks 9+)

Core Exercise	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Side Plank Leg Lift	Hold 60 seconds/side	3 (alternate sides)	30 seconds	3 days



1. Lay on your right side with your right arm underneath.
2. Align your shoulders, hips and ankles in a straight line.
3. Slowly raise your body until your hip is off the ground. Use your right arm to support your weight.
4. With your body off the ground, raise your left leg toward the sky as high as you can without rotating your hips forward/backward.
5. Slowly lower your body to the ground and repeat. After 15 leg lifts, change sides and repeat to complete one set.



Strength Exercise

Tuck Jump

(Weeks 1-8)

Strength Exercises	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Tuck Jump	30 seconds (about 20 repetitions)	2	30 seconds	Every other



1. Stand with both feet shoulder-width apart.
2. Squat down evenly on both legs and jump up attempting to tuck both knees into your chest.
3. Land softly on the ground with both knees slightly bent.
4. Return to the starting position and repeat the exercise for 30 seconds—about 20 repetitions to complete one set.



Strength Exercise

1-Leg Toe Touch

(Weeks 1-8*)

Strength Exercises	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
1-Leg Toe Touch	30 seconds (about 15 repetitions)	2 alternate sides	30 seconds	3 days



1. Stand on your **right leg** and slightly bend your knee.
2. Reach down with your **left hand** and touch the front of your **right foot**.
3. Slowly return to the starting position and repeat the sequence to complete the repetitions above, then switch legs.

***Note:** For weeks 5-8, repeat the above exercise for speed. It is very important to maintain proper form throughout the exercise and to perform it in a controlled manner to prevent injury and get the maximum benefit from the increased speed..



Strength Exercise

Kneeling Nordic Hamstring[★]

(Weeks 1-9+)

Strength Exercises	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Kneeling Nordic Hamstring [*]	5 repetitions	2	1 minute	1 day



1. Begin in a kneeling position as shown above.
2. Have a partner hold both of your ankles firmly on the ground.
3. Place both your arms in front of your chest and slowly begin to lower your body to the ground. Do not allow yourself to drop. Lowering should be slow and controlled.
4. Keep your back straight and avoid bending at the waist.
5. **USE YOUR ARMS TO PUSH YOURSELF BACK INTO THE STARTING POSITION.**
6. Repeat exercise to complete repetition recommendations above.

★Caution: Performing this exercise in-season without sufficient pre-conditioning and time to recover (more than 2 days) before the next competition, practice, etc., may over train the hamstrings and cause an injury.



Strength Exercise

Tuck Jump Repeats

(Weeks 9+)

Strength Exercises	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
Tuck Jump Repeats	30 seconds (about 20 repetitions)	2	30 seconds	Every other



1. Stand with both feet shoulder-width apart.
2. Squat down evenly on both legs and jump up attempting to tuck both knees into your chest.
3. Land softly on the ground with both knees slightly bent.
4. Return to the starting position and repeat the exercise for 30 seconds—about 20 repetitions to complete one set.

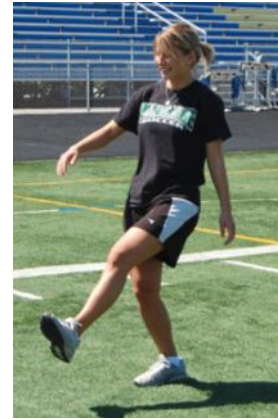


Strength Exercise

1-Leg Toe Touch Kick

(Weeks 9+)

Strength Exercises	Distance, Time or Repetitions	Sets	Rest Time	Number of Days per Week
1-Leg Toe Touch Kick	30 seconds (about 10 repetitions)	2 (alternate sides)	30 seconds	3 days



1. Place a soccer ball in front of your right foot.
2. Stand and balance on your **right** leg.
3. Slowly begin to bend forward at the hips.
4. Reach down with your **left** hand and touch the front of your right foot.
5. Return to the single leg stance and kick the ball forward to a partner.



Sports Medicine, Injury Prevention Expertise Provided by Team Chudik

The goal of Dr. Steven Chudik and his health performance team, Larana Stropus and Keith Tesch, is to provide you and your athletes with reliable and proven training information to help athletes compete and perform at their highest level and ability.

The ACL5 program is based upon research that found athletes need to incorporate specific exercises into their weekly training schedules to not only maintain their strength, but more important, help minimize their injuries. To maximize the benefits of this program, it is important for players to follow the recommended number of sets and repetitions while maintaining proper form at all times. Failure to do so could result in an injury.



Steven C. Chudik, MD

Board-certified physician in orthopaedics and sports medicine with the Steven Chudik MD Shoulder and Knee Injury Clinic, Dr. Chudik is a pioneer in arthroscopic shoulder and knee surgery. He is the founder and president of the Orthopaedic Sports Medicine Teaching and Research Foundation (OTRF), a clinical assistant professor at Loyola University Medical Center and a research associate at Argonne National Laboratories.



Keith Tesch, CSCS, CNT

For more than 14 years, Keith has been a personal trainer in the fitness industry. He provides post-therapy training in a physical therapy setting helping individuals and athletes gain strength, lose weight and improve their lifestyles through healthy habit changes. Keith focuses on achieving results through research-based programs and techniques. He is the fitness director at Body Solutions in Naperville and Bolingbrook, Ill.



Larana Stropus, MS, ATC/L

A certified and licensed athletic trainer, Larana holds a B.S. in Kinesiology and M.S. in Exercise Science. She has more than 11 years of experience in athletic training, personal training and teaching. She also served as the athletic trainer for the Olympic Development Women's Soccer program and helped develop exercise prescriptions and training programs for elite athletes including the Chicago Blackhawks.



Sports Injury Medicine Clinic

As further assistance to coaches, athletic trainers, players and parents, Dr. Chudik has a Monday evening Sports Medicine Injury Clinic in his Westmont office. During this time, athletes can be seen and treated by Dr. Chudik, a board-certified orthopaedic surgeon and sports medicine physician. An added benefit to athletes seen in the Clinic is the availability of an X-ray suite and an open-bore, high-field magnetic resonance imaging (MRI) machine. This onsite diagnostic capability eliminates the need of added appointments and delayed diagnosis and treatment. To schedule an appointment with Dr. Chudik call 630-920-2350.

Injury Hotline

Dr. Chudik and his staff understand the importance of school athletic personnel needing access to reliable sports medicine and training information outside the hours of the Sports Medicine Injury Clinic. To accommodate that need, Dr. Chudik has an Injury Hotline just for athletic trainers. Athletic trainers interested in learning more about this special service should email Dr. Chudik at stevenchudikmd@gmail.com/.

About OTRF

Dr. Steven Chudik, orthopaedic surgeon and sports medicine physician with the Steven Chudik Shoulder & Knee Injury Clinic, Westmont, Ill., founded the Orthopaedic Surgery and Sports Medicine Teaching and Research Foundation (OTRF) in 2007. OTRF is a nonprofit, 501(c)(3) organization dedicated to funding research and education—for the purpose of keeping people active and healthy. In an effort to prevent injury and remain active—especially for young athletes—Dr. Chudik saw a growing demand from patients,

clinicians and other healthcare professionals for up-to-date medical information and unbiased research on injury prevention, arthritis and wear and tear on the musculoskeletal systems—joints, cartilage, tendons, ligaments, etc. In response to these requests, OTRF produces and distributes a monthly newsletter, shares information about health performance-related issues such as nutrition and fitness, hosts athletic training educational programs and conducts seminars for healthcare providers and the community. The Foundation also funds unbiased orthopaedic research and technologies in emerging areas such as arthroscopic and minimally invasive surgery for shoulder and knee sports injuries. For additional information or to learn about charitable donation opportunities, contact

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Sports Medicine Injury Clinic

Monday
Evenings

Call 630-920-2350
for an appointment

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Don't miss another issue of **Active Bones**, the monthly E-newsletter from OTRF. Each issue has information to help you stay healthy and live an active life with tips on injury prevention, nutrition, sports conditioning, research and newsmakers.

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