



BOOST injury prevention programs

Lower-body injuries are very common in sports, especially ones that include jumping, pivoting and cutting (soccer, football, basketball, baseball and lacrosse, to name a few). These injuries can be devastating for an athlete, resulting in weeks or months of rehabilitation, while also leaving their team short-handed in their absence. Poor hip, glute or core strength, as well as excessive foot pronation or hip rotation, all increase the chances of suffering many types of lower-body injuries, but one of the most common and most devastating injuries is an ACL tear.

- 61% of ACL tears occur in 15- to 29-year-olds
- 70% of ACL tears occur during non-contact activities
- Females are three to eight times more likely to injure their ACLs than males

The best way to decrease the chances of suffering a lower-body injury is by recognizing and addressing the risk factors before it's too late! BOOST Functional Sport Training has developed injury prevention programs that will improve the deficiencies that contribute to poor mechanics and lead to injuries. Implementing these programs into weekly sporting activities can strengthen the important muscles of the core, hips, glutes and legs to decrease chances of injury, improve performance and ultimately keep the athlete on the field/court. Research shows that athletes participating in a regular preventive training program:

- Have a **62% to 88% reduction** in the risk of tearing their ACLs
- Are **3.6 times less likely** to suffer a knee injury (for females, specifically)

Given their daily presence and interaction with teams, coaches are the best teachers and monitors of injury prevention programs. Coaches can provide the close supervision that is necessary to ensure these activities are done correctly on a daily/weekly basis. By instructing and encouraging proper form, coaches will not only help their athletes strengthen the muscles that protect against injury, but they will also improve their balance, endurance and overall performance.

A physical therapist and/or athletic trainer from BOOST will instruct coach(es) in the following:

- How to recognize poor form during jumping, landing and squatting
- How to teach/encourage good form during jumping, landing and squatting
- How to perform the preseason injury prevention program
- How to perform the in-season injury prevention program

Training will take approximately one hour and will be interactive; participants should be prepared to physically take part in certain activities in order to learn and appreciate how they are done correctly. Our goal is for coaches to be confident in teaching their athletes these exercises while also being comfortable identifying mistakes or errors and correcting them.

For more information on how to schedule this training, contact your TriHealth athletic trainer or Kim Joest at 513 204 6490.



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Injury prevention program (preseason)

This preseason program consists of stretching, strengthening, balance and plyometrics activities to address potential deficits in the strength and coordination of the core and lower body.

- Initiate at least six weeks prior to the start of the season
- Perform at least three times/week or at the beginning of each practice or conditioning session
- Complete in less than 30 minutes

Warmup (no rest between exercises)

1. Forward and backward jog [elapsed time: 0–0.5 minute]

- Jog forward to far sideline and return by jogging backward.
- **Notes:** Maintain good running technique with the hip/knee/ankle in straight alignment without the knee caving in or the feet whipping out to the sides. When jogging backward, land on your toes without fully extending or locking your knees.

2. Side shuffle [elapsed time: 0.5–1 minute]

- Side shuffle to far sideline, maintaining an athletic stance with knees bent. Begin leading with one leg, pushing off with the other. Switch sides on the way back.
- **Notes:** Keep the hip/knee/ankle of the back leg in a straight line when pushing off.

3. Bounding (2 sets) [elapsed time: 1–1.5 minutes]

- Run with high bounding steps with a high knee lift, landing gently on the ball of your foot. Use an exaggerated arm swing with each step. Bound to the far sideline, then jog back to recover. Repeat.
- **Notes:** Do not let the leading leg cross the midline of your body, and do not let your knee cave inward.

Dynamic stretching (no rest between exercises)

10 yards/steps x 2 each [elapsed time: 1.5–7 minutes]

1. Toe swipes

- Take a small step forward, lift the ankle/foot and extend the knee, and bend to “swipe” toes as if pulling a sock off the end of your foot. Alternate.

2. Monster walks

- Kick leg straight out in front of you, keep the knee straight and reach to touch your toes with same side arm. Alternate.

3. Inchworm

- Lower into a push-up position and alternate stepping each foot forward while maintaining straight knees. Repeat.

4. Hip over and back

- Step forward with one leg, flex the other hip and knee to 90°, and open hip out to the side as if lifting back and forth over a small hurdle. Alternate.

5. Knee hugs

- Bring one knee to your chest, and use arms to give an extra squeeze. Alternate.

6. Ankle grabs

- Bend your knee, grab your foot/ankle and give an extra squeeze. Alternate.

7. Lunge twists

- Lunge forward and twist your trunk/upper body to the left and right. Alternate.

8. Lateral lunge and lean + ankle cross + side bend with upper body

- Side lunge to left, lean to the left and then to the right, then cross right leg behind left leg and lean your trunk to the left side with arm overhead (to stretch lateral hip of back leg). Perform for ~10 yards stretching the left, then ~10 yards stretching the right.

9. Forward lunge, backward lean

- Lunge forward, then reach both arms overhead and lean backward (feel stretch in back leg). Alternate.

Strengthening and balance (15-second rest between exercises)

1. Backward tap-downs (x 20 reps each leg, no rest between legs) [elapsed time: 7–8 minutes]

- Stand on one leg at the center of a step/box with the other leg hanging over the back edge with ankle/toes lifted up. Bend through your weight-bearing leg to lower the hanging foot down to tap the ground, then straighten back up. Keep knee in line with toes and keep knee behind toes. Repeat on other leg.
- **Notes:** Body weight should be shifted more through the heel of the weight-bearing leg; do not shift weight onto the hanging leg as it taps the ground.

2. Single-leg dead lifts (x 15 reps each leg, no rest between legs) [elapsed time: 8–9.5 minutes]

- Hold a weight at your side with one hand and stand on the opposite leg. With your knee slightly bent, engage your abdominals and perform a stiff-legged deadlift by bending at the hip (extending your free leg backward for balance) and lowering the weight until your trunk is parallel to the ground, then return to upright position.

3. Y-balance taps (3 taps x 5 reps each leg)

[elapsed time: 9.5–11.5 minutes]

- An imaginary clock face is visualized for this activity with the athlete standing at the center. While standing on the left leg and maintaining proper squatting form and single-leg balance, use the right leg to reach out in the following directions and tap your toes:

- › Straight forward (toward 12 o'clock)
- › Diagonally backward (between 4 and 5 o'clock)
- › Diagonally backward and across your body (between 7 and 8 o'clock)

- **Notes:** Reach only as far as you can without breaking proper form at the knee (keeping knee in line with toes and knee behind toes) and without losing balance.

4. Bridges (x 20 reps) *[elapsed time: 11.5–12.5 minutes]*

- Lie on your back with knees bent. Engage your abdominals and glutes, lift your buttocks off the ground and then lower. Keep your stomach and glutes tight, and do not hold your breath.

- **Notes:** This can be made more difficult by crossing one foot over the opposite knee (into a "figure-4" position) and performing single-leg bridges (x 15 reps on each leg, no rest between legs).

5. Planks (30 seconds x 2 reps, 15-second rest between reps)

[elapsed time: 12.5–14 minutes]

- Rise onto your forearms and toes with weight evenly distributed and stomach tight. Keep your hips low and in line with your body. Rest 15 seconds between reps.

- **Notes:** If athlete is unable to maintain proper form, this can be made easier by rising onto forearms and knees (instead of toes).

- Progress to 45-second and ultimately 60-second hold times if athlete displays proper form. Once these are progressed to 60-second hold times, perform only one repetition.

6. Side planks (30 seconds x 2 reps each side, no rest between reps)

[elapsed time: 14–16.5 minutes]

- Rise onto left elbow and left foot, with elbow positioned directly under your shoulder and feet stacked. Hold your body in a straight line without allowing your hips to sag. Alternate sides without resting.

- **Notes:** If athlete is unable to maintain proper form, this can be made easier by rising onto elbow and knee (instead of foot) with knees stacked and bent.

- Progress to 45-second and ultimately 60-second hold times if athlete displays proper form. Once these are progressed to 60-second hold times, perform only one repetition on each side.

Plyometrics (15-second rest between exercises)

1. Squat jumps (x 20 reps) *[elapsed time: 16.5–17.5 minutes]*

- With feet a shoulder's width apart, squat down such that your hips move backward and your knees stay behind your toes, then explode up into a jump. As you land, return into a squat, maintaining proper form with your knees in line with your toes, then explode into another jump. Keep head and chest up, back straight.

- **Notes:** If the athlete does not display proper squatting form (i.e., cannot control knees from caving in) during either the takeoff or landing portions, have them perform squats only (without jumps) until they consistently demonstrate proper form and control.

2. Diagonal hop and holds (x 20 reps total)*

[elapsed time: 17.5–18.5 minutes]

- Begin in quarter squat position on one leg and jump diagonally, landing softly in a quarter squat on the opposite leg. Land on the ball of your foot with your knee in line with your toes. Hold the landing for ~2 seconds, and maintain your balance on one leg before jumping again. Alternate legs.

- **Notes:** Make this jump as big and explosive as you can, as long as you maintain proper takeoff and landing mechanics at the knee and demonstrate proper lower-body form and control.

3. Line/cone jumps: forward-backward (x 20 reps)*

[elapsed time: 18.5–19.5 minutes]

- Begin in quarter squat position with feet a shoulder's width apart, and jump forward and then quickly backward over a line (or cone). Land in a deep squat position, absorbing the jump to 90° at the knee. Hold the landing for 1–2 seconds.

- **Notes:** Progress this exercise by performing a single-leg forward-backward jump over a line or small 2" cone x 15 reps on each leg. **Proper form and lower body control must be consistently demonstrated during single-leg jumps; if not, perform double-leg jumps only.**

4. Line/cone jumps: side-to-side (x 10 reps each direction)*

[elapsed time: 19.5–20.5 minutes]

- Begin in quarter squat position with feet a shoulder's width apart, and jump side-to-side over a line (or cone), quickly to the left and back to the right, landing in a deep squat position and absorbing the landing down to 90° at the knee. Hold the landing for 1–2 seconds. Repeat this in the opposite direction.

- **Notes:** Progress this exercise by performing a single-leg side-to-side jump over a line or small 2" cone x 15 reps on each leg. **Proper form and lower-body control must be consistently demonstrated during single-leg jumps; if not, perform double-leg jumps only.**

5. Scissor jumps (x 20 reps total)

[elapsed time: 20.5–21.5 minutes]

- Begin in a lunge position with knees flexed to 90° and in line with toes. Explode upward into a jump and land with legs in opposite positions, absorbing the landing down to 90° at the knees.

*If athletes are younger than 12 years old, plyometric activities should be performed only over a visual line on the field/court (instead of cones, when applicable), and jumps should be landed with two feet. Single-leg plyometrics should not be performed with young athletes until they develop substantial lower-body control.

Running (no rest between exercises)

For running exercises, set up cones every 10 yards along the court/field, or use the yard lines or markings that are approximately 10 yards apart.

1. Running + circling partner (2 sets)

[elapsed time: 22–23.5 minutes]

- Line up with a partner, separated by 10 yards, and run forward 10 yards as a pair, then shuffle sideways to meet in the middle and shuffle an entire circle around each other. Then shuffle away from each other and run forward again as a pair another 10 yards, and repeat this across the court/field. Jog back to the starting line to recover and repeat.

2. Running + shoulder contact (2 sets)

[elapsed time: 23.5–25 minutes]

- Line up with a partner, separated by 10 yards, and run forward 10 yards as a pair, then shuffle sideways to meet in the middle and jump sideways toward each other to make shoulder-to-shoulder contact. Then shuffle away from each other and run forward again as a pair another 10 yards, and repeat this across the court/field. Jog back to the starting line to recover and repeat.
- **Notes:** Land on both feet with hips and knees bent without letting knees cave inward. Make it a full jump and synchronize your timing with your partner as you jump and land.

3. Running + quick forward and backward (2 sets) *[elapsed time: 25–26.5 minutes]*

- Line up with a partner, separated by 10 yards, and run quickly forward as a pair 20 yards, then quickly backpedal 10 yards, keeping hips and knees bent. Continue running forward quickly (20 yards) and backpedaling (10 yards) across the field/court. Jog back to the starting line to recover and repeat.

4. Running + plant and cut (2 sets) *[elapsed time: 26.5–28 minutes]*

- Jog 4 to 5 steps, then plant on the outside leg and cut to change direction. Accelerate and sprint 5 to 7 steps at high speed (80% to 90% maximum pace) before decelerating and planting and cutting again on the opposite leg. Do not let your knee cave inward. Continue this across the field/court, and then jog back to the starting line to recover and repeat.

Injury prevention program (preseason)

- Initiate at least six weeks prior to the start of the season
- Perform at least three times/week or at the beginning of each practice or conditioning session
- Complete in less than 30 minutes

Warmup (no rest between exercises)

1. Forward and backward jog
2. Side shuffle
3. Bounding

Dynamic stretching (no rest between exercises)

10 yards/steps x 2 each

1. Toe swipes
2. Monster walks
3. Inchworm
4. Hip over and back
5. Knee hugs
6. Ankle grabs
7. Lunge twists
8. Lateral lunge and lean + ankle cross
+ side bend with upper body
9. Forward lunge, backward lean

Plyometrics (15-second rest between exercises)

1. Squat jumps (x 20 reps)
2. Diagonal hop and holds (x 20 reps total)
3. Line/cone jumps: forward-backward (x 20 reps)
4. Line/cone jumps: side-to-side (x 10 reps each direction)
5. Scissor jumps (x 20 reps total)

Running (no rest between exercises)

1. Running + circling partner (2 sets)
2. Running + shoulder contact (2 sets)
3. Running + quick forward and backward (2 sets)
4. Running + plant and cut (2 sets)

Injury prevention program (in-season)

- Initiate at the start of the season and continue throughout the entire season
- Perform at least three times/week or at the beginning of each practice
- Complete in less than 20 minutes

Warmup (no rest between exercises)

1. Forward and backward jog [elapsed time: 0–0.5 minute]
 - Jog forward to far sideline and return by jogging backward.
 - **Notes:** Maintain good running technique with the hip/knee/ankle in straight alignment without the knee caving in or the feet whipping out to the sides. When jogging backward, land on your toes without fully extending or locking your knees.
2. Side shuffle [elapsed time: 0.5–1 minute]
 - Side shuffle to far sideline, maintaining an athletic stance with knees bent. Begin leading with one leg, pushing off with the other. Switch sides on the way back.
 - **Notes:** Keep the hip/knee/ankle of the back leg in a straight line when pushing off.
3. Bounding (2 sets) [elapsed time: 1–1.5 minutes]
 - Run with high bounding steps with a high knee lift, landing gently on the ball of your foot. Use an exaggerated arm swing with each step. Bound to the far sideline, then jog back to recover. Repeat.
 - **Notes:** Do not let the leading leg cross the midline of your body, and do not let your knee cave inward.

Dynamic stretching (no rest between exercises)

10 yards/steps x 2 each [elapsed time: 1.5–6 minutes]

1. Toe swipes
 - Take a small step forward, lift the ankle/foot and extend the knee, and bend to “swipe” toes as if pulling a sock off the end of your foot. Alternate.
2. Monster walks
 - Kick leg straight out in front of you, keep the knee straight and reach to touch your toes with same side arm. Alternate.
3. Hip over and back
 - Step forward with one leg, flex the other hip and knee to 90°, and open hip out to the side as if lifting back and forth over a small hurdle. Alternate.
4. Knee hugs
 - Bring one knee to your chest and use arms to give an extra squeeze. Alternate.
5. Ankle grabs
 - Bend your knee, grab your foot/ankle and give an extra squeeze. Alternate.
6. Lunge twists
 - Lunge forward and twist your trunk/upper body to the left and right. Alternate.

7. Lateral lunge and lean + ankle cross + side bend with upper body

- Side lunge to left, lean to the left and then to the right, then cross right leg behind left leg and lean your trunk to the left side with arm overhead (to stretch lateral hip of back leg). Perform for ~10 yards stretching the left, then ~10 yards stretching the right.

8. Forward lunge, backward lean

- Lunge forward, then reach both arms overhead and lean backward (feel stretch in back leg). Alternate.

Strengthening and balance (15-second rest between exercises)

1. Single-leg squats (x 10 reps each leg)

[elapsed time: 6–7 minutes]

- While standing on one leg and maintaining proper squatting form and single-leg balance, perform a single-leg squat, extending your free leg backward for balance.
- **Notes:** Squat only as far as you can without breaking proper form at the knee (keeping knee in line with toes and knee behind toes) and without losing balance.

2. Y-balance taps (3 taps x 3 reps each leg)

[elapsed time: 7–8 minutes]

- An imaginary clock face is visualized for this activity with the athlete standing at the center. While standing on the left leg and maintaining proper squatting form and single-leg balance, use the right leg to reach out in the following directions and tap your toes:
 - › Straight forward (toward 12 o'clock)
 - › Diagonally backward (between 4 and 5 o'clock)
 - › Diagonally backward and across your body (between 7 and 8 o'clock)
- **Notes:** Reach only as far as you can go without breaking proper form at the knee (keeping knee in line with toes and knee behind toes) and without losing balance.

3. Single-leg bridges (x 20 reps) [elapsed time: 8–9 minutes]

- Lie on your back with one foot crossed over the opposite knee (into a “figure-4” position). Engage your abdominals and glutes, lift your buttocks off the ground and then lower. Keep your stomach and glutes tight, and do not hold your breath.

4. Plank (60 seconds x 1 rep) [elapsed time: 9–10 minutes]

- Rise onto your forearms and toes with weight evenly distributed and stomach tight. Keep your hips low and in line with body.
- **Notes:** If athlete is unable to maintain proper form, this can be made easier by rising onto forearms and knees (instead of toes).

5. Side planks (60 seconds x 1 rep each side, no rest between sides)

[elapsed time: 10–12 minutes]

- Rise onto left elbow and left foot, with elbow positioned directly under your shoulder and feet stacked. Hold your body in a straight line without allowing your hips to sag.
- **Notes:** If athlete is unable to maintain proper form, this can be made easier by rising onto elbow and knee (instead of foot) with knees stacked and bent.

Plyometrics (15-second rest between exercises)

1. Squat jumps (x 10 reps) *[elapsed time: 12.5–13 minutes]*

- With feet a shoulder's width apart, squat down such that your hips move backward and your knees stay behind your toes, then explode up into a jump. As you land, return into a squat, maintaining proper form with your knees in line with your toes, then explode into another jump. Keep head and chest up, back straight.
- **Notes:** If the athlete does not display proper squatting form (i.e., cannot control knees from caving in) during either the takeoff or landing portions, have them perform squats only (without jumps) until they consistently demonstrate proper form and control.

2. Diagonal hop and holds (x 20 reps total)*

[elapsed time: 13–14 minutes]

- Begin in quarter squat position on one leg and jump diagonally, landing softly in a quarter squat on the opposite leg. Land on the ball of your foot with your knee in line with toes. Hold the landing for ~2 seconds, and maintain your balance on one leg before jumping again. Alternate legs.
- **Notes:** Make this jump as big and explosive as you can, as long as you maintain proper takeoff and landing mechanics at the knee and demonstrate proper lower body form and control.

3. Line/cone jumps: forward-backward (x 10 reps)*

[elapsed time: 14–15 minutes]

- Begin in quarter squat position with feet a shoulder's width apart, and jump forward and then backward over a line (or cone). Land in a deep squat position, absorbing the jump to 90° at the knee. Hold the landing for 2 seconds.
- **Notes:** Progress this exercise by performing a single-leg forward-backward jump over a line or small 2" cone x 15 reps on each leg. **Proper form and lower-body control must be consistently demonstrated during single-leg jumps; if not, perform double-leg jumps only.**

4. Line/cone jumps: side-to-side (x 5 reps each direction)*

[elapsed time: 15–16 minutes]

- Begin in quarter squat position with feet a shoulder's width apart and jump side-to-side over a line (or cone). Land in a deep squat position, absorbing the landing down to 90° at the knee. Hold the landing for 2 seconds.
- **Notes:** Progress this exercise by performing a single-leg side-to-side jump over a line or small 2" cone x 15 reps on each leg. **Proper form and lower-body control must be consistently demonstrated during single-leg jumps; if not, perform double-leg jumps only.**

Running (no rest between exercises)

For running exercises, set up cones every 10 yards along the court/field, or use the yard lines or markings that are approximately 10 yards apart.

1. Running + circling partner (1 set)

[elapsed time: 16–17 minutes]

- Line up with a partner, separated by 10 yards, and run forward 10 yards as a pair, then shuffle sideways to meet in the middle and shuffle an entire circle around each other. Then shuffle away from each other and run forward again as a pair another 10 yards, and repeat this across the court/field. Jog back to the starting line to recover.

2. Running + shoulder contact (1 set)

[elapsed time: 17–18 minutes]

- Line up with a partner, separated by 10 yards, and run forward 10 yards as a pair, then shuffle sideways to meet in the middle and jump sideways toward each other to make shoulder-to-shoulder contact. Then shuffle away from each other and run forward again as a pair another 10 yards, and repeat this across the court/field. Jog back to the starting line to recover.
- **Notes:** Land on both feet with hips and knees bent without letting knees cave inward. Make it a full jump and synchronize your timing with your partner as you jump and land.

3. Running + quick forward and backward (1 set)

[elapsed time: 18–18.5 minutes]

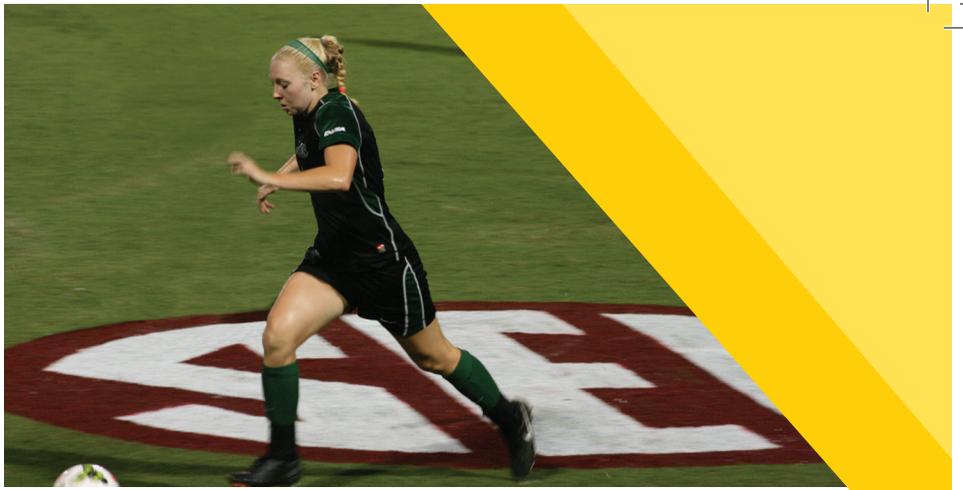
- Line up with a partner, separated by 10 yards, and run quickly forward as a pair 20 yards, then quickly backpedal 10 yards, keeping hips and knees bent. Continue running forward quickly (20 yards) and backpedaling (10 yards) across the field/court. Jog back to the starting line to recover.

4. Running + plant and cut (1 set)

[elapsed time: 18.5–19 minutes]

- Jog 4 to 5 steps, then plant on the outside leg and cut to change direction. Accelerate and sprint 5 to 7 steps at high speed (80% to 90% maximum pace) before decelerating and planting and cutting again on the opposite leg. Do not let your knee cave inward. Continue this across the field/court, and then jog back to the starting line to recover.

*If athletes are younger than 12 years old, plyometric activities should be performed only over a visual line on the field/court (instead of cones, when applicable), and jumps should be landed with two feet. Single-leg plyometrics should not be performed with young athletes until they develop substantial lower-body control.



BOOST injury prevention

Injuries are very common in sports, especially ones that include jumping, cutting or repetitive throwing. These injuries can be devastating for an athlete, resulting in weeks or months of rehabilitation, while also leaving their team short-handed in their absence. Most injuries have warning signs before they occur, and BOOST Functional Sport Training can help address them and lower the chances of an injury before it's too late!

A BOOST clinician can perform tests to determine if an athlete is at high risk for an upper- or lower-body injury. If risk factors are present, they are usually due to weakness in the stabilizing muscles of the spine, arms or legs. If these deficits are not addressed, the athlete will have a greater chance of suffering a future injury, ranging from a muscle strain in the shoulder to a more devastating injury such as an ACL tear in the knee.

BOOST offers one-on-one assessments where a certified athletic trainer will identify muscle imbalances or faulty mechanics and then train the athlete in proper strengthening and stabilization exercises to improve these areas. During an assessment, the athlete will be instructed in a customized home exercise routine to address their deficits, though if they need considerable training or strengthening, a more in-depth injury prevention program may be recommended. Taking part in a BOOST injury prevention program can not only lower an athlete's chance of injury, but it can also contribute to improved performance in their sport.

- **One-time assessment: \$30**
- **Eight-session injury prevention program: \$225**
(one-time assessment cost will count toward this package price if purchased)

For more information on injury prevention programs or BOOST's return to sport program following an injury, visit or contact one of the three locations. Don't ignore the warning signs—BOOST can help prevent a devastating injury!

**TriHealth Orthopedic & Sports Institute
Mason Physical Therapy**
6020 Mason-Montgomery Road
Mason, OH 45040
513 204 6490

**TriHealth Orthopedic & Sports Institute
Rookwood Physical Therapy**
4030 Smith Road, Suite 350
Cincinnati, OH 45209
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**TriHealth Orthopedic & Sports Institute
Western Ridge Physical Therapy**
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