

# ACL Injury Prevention

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Presented by

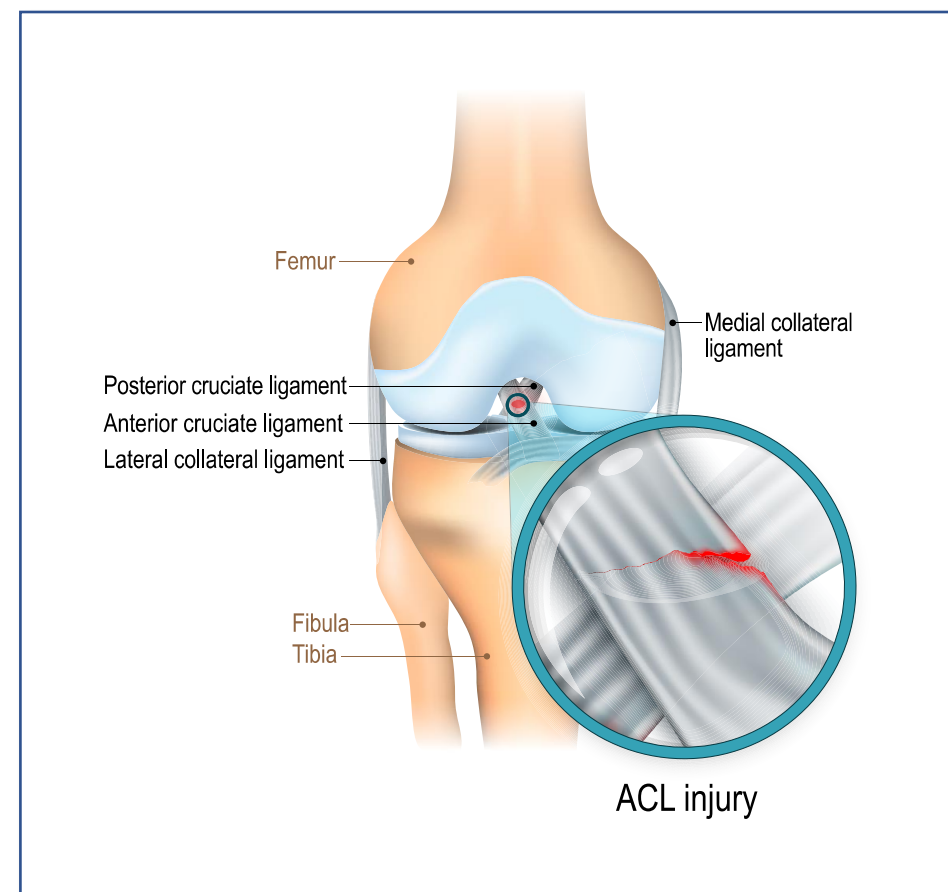


Ortho Rhode Island








# Background

- ACL injuries are very prevalent in high school athletics.
- Each year 20,000 to 80,000 female high school athletes suffer from an ACL injury while participating in a sporting activity.
- Females are 5 times more likely to sprain, tear or rupture their ACL compared to their male counterparts.
- ACL Injury Prevention Programs are valuable tools for preventing injury risk.
- According to Yu-Lun Huang, et al.'s systematic review of ACL IPP efficacy, it was concluded that ACL IPPs have a significant protective effect to reduce injury by 53%.
- It is important that OrthoRI becomes involved in reaching out to the community and aide in preventing future injury through implementation of an effective ACL IPP.






# ACL Prevention Program Trials

-  We had the opportunity to trial the ACL program with 2 teams at this time
-  Both programs were hosted at OrthoRI Warwick
-  With both programs there was a large turnout in the weeks prior to the season, however as the official season would draw near the number of participants would decrease
-  We were able to refine and distribute the program effectively, however it may be more advantageous to modify the program to be performed by the team without needing to leave their school
-  This will improve participation of athletes as well as improve brand recognition






# Target Audience

-  RIIL and General Public
-  Our main goal is to create a comprehensive and easy to follow ACL prevention program that can be distributed to schools to perform independently
-  There will be an option for an individual from OrthoRI meet with the school in person for the first session
  - This session will focus on explaining the importance of the program and set up the team for proper execution of the program individually



# New Proposal

-  We would like to take the program that we have been using and turn it into a comprehensive booklet that can be distributed to schools
-  This booklet will provide detailed explanations of the purpose of the program, specific warmups and exercises progressions as well as online access to the exercises for references
-  We will give the school the option to have an OrthoRI employee introduce the program for a single session to ensure proper execution





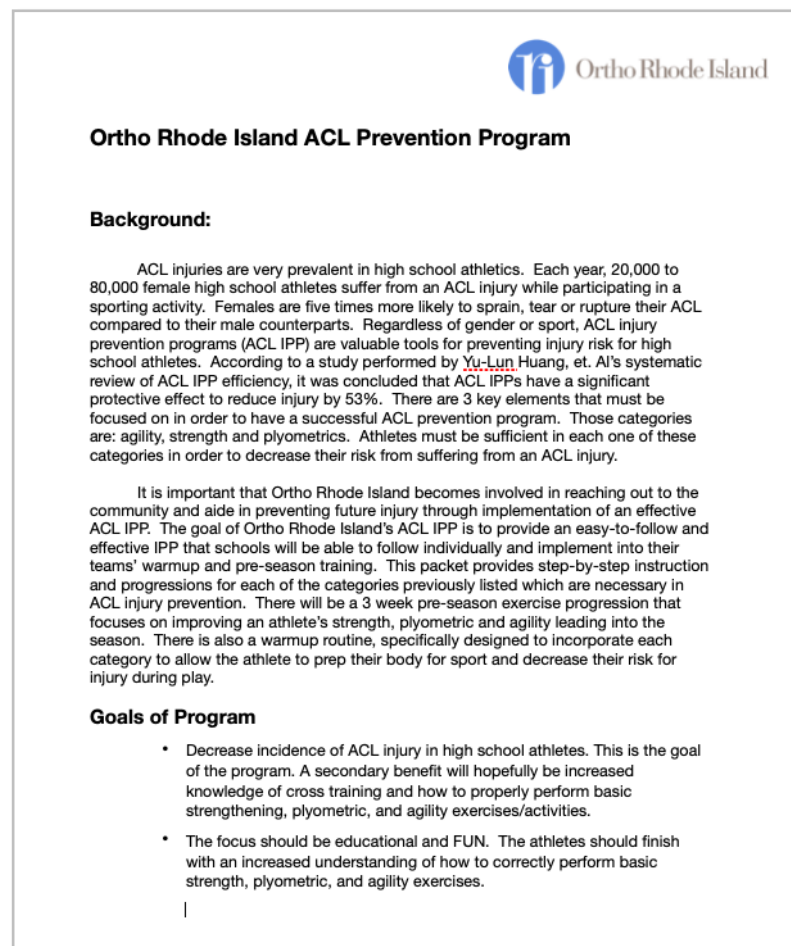
# New Modified Program for Individual Use

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# Program Outline

## Cover Page:



# Program Outline

## Pre-Testing:

### Drop Jump Test

**Purpose:** to measure the explosive force of the lower limbs; this looks at the reactive strength index which is basically the capability of the athlete to go from an eccentric to a concentric contraction. It represents the ability of the athlete to utilize the stretch-shorten cycle. The reactive strength index has also been shown to have a strong relationship between change of direction and acceleration speed. In this case the focus is primarily on identifying deviations from proper technique and educating / correcting the athletes vs measuring the actual vertical jump height

#### 1. Equipment needed:

- 18" box

#### 2. Set up:

- Set 18" box at edge of turf
- Have other staff member ready to video with iPad (make sure camera is set up to focus on mid thigh area and below)

#### 3. Test

- Have athlete stand on 18" box with both arms overhead
- Instruct to drop / "step off" the box onto the floor/turf, bending the knees while landing, and then immediately perform a maximal vertical jump. The arms will lower down as the athlete drops off the box and rise up overhead as they perform the vertical jump
- The athlete should jump vertically as high as possible, and land back on the floor/turf with both feet landing at the same time, returning to the takeoff spot
- Each athlete will perform 3 attempts
  1. Right foot forward, filming from front
  2. Left foot forward, filming from front
  3. Athlete choice foot forward, film from side of leg standing on box
- The videographer will film the first attempt from the front view and the second attempt from the side view

\*\*\* Each athlete will get 2 practice squats

Common deviations to look for:

\_\_\_Body lean (excessive lean forward)  
\_\_\_Knee valgus collapse  
\_\_\_Leg dominance

Rating:

Excellent: no deviations exist  
Good: 1 deviation present  
Fair: 2 deviations present  
Poor: all 3 deviations present

### ACL IPP Testing Score Sheet

Name: \_\_\_\_\_

Age: \_\_\_\_\_

Date: \_\_\_\_\_

Test:

Score / Rating

Single leg squat test

Right: \_\_\_\_\_

Comments:

Left: \_\_\_\_\_

\_\_\_ Hip flexion <65 deg

\_\_\_ Hip abduction/adduction > 10 deg

\_\_\_ Knee valgus/varus < 10 deg

\_\_\_ Other: \_\_\_\_\_

Pro Agility test

Right: \_\_\_\_\_

Comments:

Left: \_\_\_\_\_

Drop Jump test

Bilateral: \_\_\_\_\_

Comments:

\_\_\_ Forward lean  
\_\_\_ Knee valgus collapse  
\_\_\_ Leg dominance

### Pro Agility Test

**Purpose:** to measure an athlete's ability to accelerate, decelerate, change direction, and re-accelerate as fast as possible. The athlete is evaluated on their ability to be explosive in their starts and turns while keeping their body under control to limit inefficient movements

#### 1. Equipment needed:

- 3 cones
- Stopwatch

#### 2. Set up:

- Place the 3 marker cones along a line 5 yds apart for a total of 10 yds
- Have 1 staff member ready to time with stopwatch

#### 3. Test

- Have athlete straddle the line in an athletic stance and touch hand to line (if athlete is going to right first, then touch line with right hand, vice versa for left)
- The athlete will go to right direction first and run 5 yds to the side, touch the line with their hand
- The athlete then turns direction, runs the opposite direction and touches hand to line on other side
- Finally the athlete turns and finished test by sprinting thru the start/finish line
- Time is stopped when the athlete crosses the finish line (center marker)
- Each athlete will perform 2 attempts
  1. Right hand down, sprinting right direction first
  2. Left hand down, sprinting left direction first
- The videographer will film both attempts from the front view

\*\*\* Each athlete will get 1 warm up turn

\*\*\* When all athletes have completed test, use rest of time to review video and give corrections to each athlete




Areas to focus on with feedback:

- Decreased speed with change of direction
- Lack of confidence and/or comfort going to one side
- Overall speed



# Program Outline

## Pre-Testing:

-  It proved to be quite difficult organizing the groups to perform the tests and use the video to improve upon their form
-  It was noticeable that the value of the pre-testing was not utilized during the run through of the program simply due to the sheer volume of athletes being tests and poor follow up
-  Due to these difficulties, it can be argued that it is better to simply assume that the athlete's targeted to participate in this program lack in all three categories and will simply benefit from the warmup/exercise programs



# Program Outline

## Dynamic Warm-Up:

### ACL IPP Pre-Season Program



#### Short Dynamic Warm-Up

##### 1. Active Stretch: 10-20 Yards

High Knees	
Toy Soldiers	
Quad stretch with arm overhead	
Leg Cradles	
Ankle Sweeps	
Lateral Lunges	
Good Mornings	

##### 2. Plyometric Activities:

Bounders	
Single Leg Front to Back Over Line: 20 reps	
Single Leg Side to Side Hops: 20 reps	
Half Kneel Hops in Place	
180 Jumps in Place: 10 reps	

##### 3. Strength Activities:

Single Leg Bridges with Opposite Hip Hold: 10x each side	
Single Leg Mini Squats into Calf Raise: 10x each side	
Plank Shoulder Taps	







RDLs into Forward Kick: 8x each side

##### 4. Agility Activities: 10-20 yards (in court or on field)

Lateral Shuffles	
Cariocas	
ProAgility (5-10-5): 2x thru (1x each direction)	

# Program Outline


## Dynamic Warm-Up:

-  This is the dynamic warm-up that will be provided to the team within the program packet
-  We have made videos going through each exercise and plan to have them be available on the OrthoRI website
-  Instructions on how to access the videos will be written once available for reference
-  The goal is to have the team continue to incorporate this into their pre-game/practice warm-up



# Program Outline

## Pre-Season Exercise Program:

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### ACL IPP Pre- Season Exercise Program

These exercises will all be performed simultaneously as a circuit. Please allot 10 minutes for each circuit.

**Week 1:**

**Strength with Equipment:**

Hip Abduction Machine		
Hamstring Curl Machine		
Glute Press Machine		
Single Leg Leg Press		

**Strength without Equipment**


Single Leg Hip Abduction with Band		
Prone Hamstring Curl with Band		
Single Leg Bridge		
Goblet Squat to Bench		

**Plyometrics:**

18" Forward Box Jump		
18" Forward Box Land		
Forward Hurdle Hop Over		

**Agility:**

Prone into Sprint then Back Peddle		
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Box Drill		
Y Drill Sprint into Shuffle Back		

**Week 2:**

**Strength:**


Assisted Single Leg Squat with Target		
Romanian Dead Lift Single Leg		
Side Plank into Hip Abduction		
Front Plank into Donkey Kick		

**Plyometrics:**

Split Squat Jumps		
Hop Over Hurdle into Front Box Jump; Forward Land into Hop		
Forward and Lateral Single Leg 8" Box Jumps		

**Agility:**

180 Cone Cutting Drill		
Ball Toss Partner Shuffle Drill/ Change Direction Drill		
Zig Zag into Rounding Cone Drill		

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**Week 3:**

**Strength:**

Hamstring Tantrums		
Nordic Hamstrings		
Pistol Squat to Block		
Bulgarian Lunges		

**Plyometrics:**




Dynamic Box Plyo Drill 1		
Dynamic Box Plyo Drill 2		

**Agility:**

Sport Specific Agility Drill 1			
Sport Specific Agility Drill 2			
Sport Specific Agility Drill 3			

# Program Outline





## Pre-Season Exercise Program:

-  These are the pre season exercises that will be performed during the program
-  It is spread out from 3 weeks and progresses each week
-  There will also be pictures in the second column to portray the exercise performed as well as videos of each exercise available on the OrthoRI website





# Conclusion

-  This program is designed to be easy to follow and accessible to all communities to use
-  It will be made available digitally on the OrthoRI website, along with informative videos for exercises
-  This program will have better outreach and improve brand recognition rather than limiting our program to being strictly in-house
-  Future programs can be updated to incorporate the special testing, follow up, etc and be in-house, however the main goal should be individual programs for schools to follow





# Thank You

For more information about the Ortho Rhode Island  
ACL Injury Prevention Program, please contact:

Tracy Gannon at [tgannon@orthopedicsri.com](mailto:tgannon@orthopedicsri.com).