

# SHIPP

## Shoulder Injury Prevention Program

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# KEEPING YOU IN THE GAME™

Our EPA clinics are conveniently located with today's busy schedules in mind. Our professional, friendly team will welcome you to the clinic and assist you in the following ways:

- billing inquiries and payment options
- health insurance provider information (WSIB, MVA, private health insurance)
- booking convenient appointments
- collecting new patient information
- answering questions and directing any concerns to the appropriate personnel

Our caring administrative team will also introduce you to your physiotherapist.

#### **Additional Services include:**

- specialized programs for shoulder, back and knee pain
- post-surgical rehabilitation
- acupuncture
- specialized programs designed for the prevention and treatment of sports injuries
- massage therapy
- motor vehicle accident injuries
- work-related injuries
- several sites offer women's health programs for breast cancer and osteoporosis
- Fit to Move™ Lifestyle Assessment for the prevention of heart disease, diabetes and stroke
- several sites offer custom brace fitting and other braces and support

Throwers go through a large range of motion at the shoulder<sup>28</sup> and generate significant force from the muscles that move the shoulder<sup>28, 21, 32</sup> in order to move the arm at a high velocity<sup>25-27, 32</sup>. To accomplish this force generation through the arm, good coordination, control of biomechanics and strength through the whole body is important<sup>26, 32, 34, 65</sup>.

Therefore, throwing athletes' shoulders need:

- significant range of motion,
- strength
- coordination
- neuromuscular control (*feedback from the nerves to the muscle*)

# SHIPP

## Background:

Luckily for those that put the time into a regular preventative conditioning program that incorporates the principle of specific training, improvements in strength, range of motion, coordination and neuromuscular control can be achieved.

For example, most throwers have excessive outward rotation and reduced inwards rotation of the shoulder with the elbow up at shoulder height; however, the total motion is usually equal between throwing and non-throwing shoulders<sup>8,9,11,24,31</sup>. This simply means that through training, the throwing shoulder has transitioned its total available range of motion to bias the outward rotation “cocking position” of throwing.

With such high demands on the shoulder it may not be a surprise that shoulder injuries are the most common injury in both amateur and professional throwing athletes<sup>15,40</sup>.

Overloading structures of the shoulder without adequate time for recovery and repair can lead to overuse type injuries such as:

- rotator cuff tears, tendonitis, labral tears, and impingement syndromes<sup>12,20,30,40,57</sup>.

We can reduce the risk for these types of injuries by controlling variables that have been associated with increased risk such as:

- intensity, duration, and frequency of play as well as rest between games<sup>36,37,50</sup>.

Shoulder injuries in throwing athletes may seem inevitable, but many of these injuries are avoidable. We just need a little bit of careful planning and implementation of a few injury prevention strategies. The ***Shoulder Injury Prevention Program (SHIPP) for throwers*** is specifically designed to reduce the risk of shoulder injuries by assisting you in the ***five key areas*** our “***Keeping You in the Game***” formula.

### **The five key components of SHIPP:**

1. Program planning
2. Early recognition of over-training
3. A dynamic warm-up
4. A strengthening and conditioning program
5. Cool-down for faster recovery

# Program Planning

## A few principles should be applied to all program plans:

- Gradually increase new activities or exercises
- Match increases in training intensity and volume with increases in rest
- Never train hard for more than three weeks in a row without a recovery week
- Increase training volume and intensity by no more than 10% per week
- Periodizing the training program will allow for adequate rest during times of increased training and volume (Decrease intensity and volume of training when approaching peak competition to allow for adequate rest)
- Decrease training (known as tapering) before an important competition approaches

### Specific recommendations for youth pitchers:

The total number of pitches that a pitcher throws, the types of pitches thrown, and the rest between bouts of throwing have all been associated with injury risk. It is therefore extremely important to modify these variables to reduce the risk of injury in young pitchers.

### Maximum number of pitches:

Age	Pitches per game	Pitches per week
9-10	75	150
11-12	85	170
13-16	95	190

### Rest between games pitched: Age 7-14

Pitches in a day	Rest time
66 or more	4 days
51-65	3 days
36-50	2 days
21-35	1 day

### Rest between games pitched: Age 15-18

Pitches in a day	Rest time
76 or more	4 days
61-75	3 days
46-60	2 days
31-45	1 day

## Age recommended for various types of pitches

Pitch	Age
Fastball	8
Change-up	10
Curveball	14
Knuckleball	15
Slider	16
Screwball	17

While the examples and recommendations given are for pitchers, the principles provided can be used to plan the training program for athletes of any overhead sports to minimize the risk of injury.

## Early recognition of over-training

A description of how to recognize over-training before it leads to an overuse injury is provided in our **Keeping You in the Game** brochure.

## Dynamic Warm-up

The purpose of a dynamic warm-up is to prepare you mentally and physically for sport performance. In doing so, an effective warm-up can improve performance and decrease risk of injury.

### A dynamic warm-up has three components:

- Active exercise – to increase heart rate gradually, warm active muscles, and bring energy and oxygen to working muscles
- Dynamic range of motion and body awareness exercise – to activate muscles through a full range of motion and gain a better sense of body control
- Sport-specific drills – to prepare the body and mind for the sport performance to come

### Example warm-up for a pitcher:

Exercise	Duration	Intensity
Jogging with arm circles	3-5 minutes	Light
Warm up throws at 30 feet	10-20 throws	50% effort
Warm up throws at 50 feet	1-2 minutes	60% effort
Pitching motion	1-2 minutes	No ball
Pitching from mound	20 pitches	50% effort and gradually increase, ending with a few repetitions of each pitch

**Note:** Many times variables are out of our control such as the period between the warm-up and competition or the duration of warm-up. The key is to balance the intensity and duration of warm-up with the rest between the warm-up and competition in order to avoid fatigue.

# Strength and Conditioning Program

**Note:** All programs will be individualized based on the time of season, performance goals.

The following exercises have been shown to improve the strength of the shoulder per week throughout the off-season and 1-2 times per week throughout the season.

## 1 ER at 0° abduction Outwards or External rotation with arm at side

Repeat 2 sets of 10 repetitions.

**Purpose:** to strengthen the rotator cuff muscles that outwardly rotate the shoulder and stabilize the shoulder blade.

**Instruction:** Begin standing facing perpendicular to a theraband anchored at elbow height. Hold the theraband with the hand furthest from the anchored end. Place a small rolled towel between your elbow and your body. Keep your shoulder back and elbow still. Rotate the arm away from your body, keeping your elbow bent at 90 degrees throughout the motion.



## 2 IR at 0° abduction Inwards or Internal rotation with arm at side

Repeat 2 sets of 10 repetitions.

**Purpose:** to strengthen the rotator cuff muscles that rotate the shoulder into the body and stabilize the shoulder blade.

**Instruction:** Begin standing facing perpendicular to a theraband anchored at elbow height. Hold the theraband with the hand closest to the anchored end. Place a small rolled towel between your elbow and your body. Keep your shoulder back and elbow still. Rotate the arm towards your body, keeping your elbow bent at 90 degrees throughout the motion. Return slowly to the starting position.



level of play and current strength and activation patterns as well as

the muscles that control the shoulder girdle. Perform these 2-3 times  
out the season in order to reduce your risk of injuries.

### 3

#### **Row (scapula retraction, neutral in standing)**

*Repeat 2 sets of 10 repetitions.*

**Purpose:** to strengthen muscles that controls the movement of your shoulder blade.

**Instruction:** Stand facing towards the theraband that is anchored in the middle of the door at about elbow height. Walk back until your arms are straight and there is a little bit of tension on the band. Initiate the movement by pinching your shoulder blades together at the back. Pinch your shoulder blades further together as you pull your elbows back toward your sides. Return slowly to the starting position.



### 4

#### **Side lying ER with towel Side lying Outward or External Rotation**

*4½ – 5½ minutes*

**Purpose:** to strengthen the muscles of the rotator cuff that rotate the shoulder outwardly.

**Instruction:** Lie on your side, place a small towel roll under the top elbow. With your arm at the side of your body and your elbow bent at 90°. Start with your hand at your stomach and keep your shoulder blade flat against your back. Rotate the arm away from the stomach towards the ceiling to about 45° above the horizontal. Return slowly to the starting position. Repeat 2 sets of 15 repetitions.



## 5

### **ER at 90° abduction** **(standing lunge-opposite leg in front)** **Outwards or External rotation at** **90 degrees abduction:**

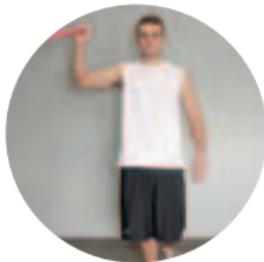
*Repeat 2 sets of 10 repetitions.*

**Purpose:** To strengthen the rotator cuff muscles and to improve control of the shoulder in overhead positions.

**Instruction:** Begin facing towards a theraband that is anchored at about chest height. Bring your elbow up to shoulder height and bend it to 90 degrees. Keep your shoulder blades back and elbow level with your shoulder. Stand in stride stance with your leg opposite to the exercising shoulder in front and the other leg behind. Rotate your hand up and backwards, slowly return to the starting position.

#### **Exercise Progressions:**

- i) Stand in a kneeling lunge position with the leg opposite to the exercising shoulder in front.
- ii) Stand only on one leg, the same leg as the exercising shoulder.



## 6

### **IR at 90° abduction** **(standing lunge-opposite leg in front)** **or in kneeling lunge** **Inwards or Internal rotation at** **90 degrees abduction**

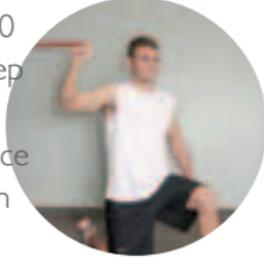
*Repeat 2 sets of 10 repetitions.*

**Purpose:** To strengthen the rotator cuff muscles and to improve control of the shoulder in overhead positions.

**Instruction:** Begin facing away from a theraband that is anchored overhead. Bring your elbow up to shoulder height and bend it to 90 degrees with your forearm inline with your ear. Keep your shoulder blades flat against your back and elbow level with your shoulder. Stand in stride stance with your leg opposite to the exercising shoulder in front and the other leg behind. Rotate your hand down towards the floor; stop when it is parallel to the floor; slowly return to the starting position.

#### **Exercise Progressions:**

- i) Stand in a kneeling lunge position with the leg opposite to the exercising shoulder in front.
- ii) Stand only on one leg, the leg opposite to the exercising shoulder.



## Strengthening (cont.)

### 7

#### Diagonal Pattern Flexion

*Repeat 10-15 times.*

**Purpose:** To strengthen and improve movement patterns in the shoulder and upper body.

**Instruction:** Stand in a lunge or stride position with the leg opposite to the exercising arm in front. Anchor a theraband on the floor on the opposite side of the exercising arm. Hold the theraband with your hand at your opposite hip and across your body. Pull the theraband by bending your elbow and drawing it up to shoulder level and straighten your arm over your head and out to the side. Return slowly to the start position.



### 8

#### Prone on exercise ball “Y” Exercise on Ball

*Repeat 2 sets of 10 repetitions.*

**Purpose:** to strengthen the muscles that control the shoulder blade and to improve your body's control of the shoulder in different positions..

**Instruction:** Lie on your stomach on an exercise ball with your feet braced on the floor and your back straight. Keep your head and neck inline with your back. Start with your arms at your side, pinch your shoulder blades down and back. Lift both of your arms forward and up towards the ceiling with your palms facing each other and thumbs pointing up until they are inline with your ears at a 45° angle away from your head to form a “Y” with your arms. Slowly return to the starting position.



## Strengthening (cont.)

9

### Prone on exercise ball “T” Exercise on Ball

*Repeat 2 sets of 10 repetitions.*

**Purpose:** to strengthen the muscles that control the shoulder blade and to improve your body's control of the shoulder in different positions.

**Instruction:** Lie on your stomach on an exercise ball with your feet braced on the floor and your back straight. Keep your head and neck in line with your back. Start with your arms hanging down straight to the floor; pinch your shoulder blades together. Lift both of your arms up away from your body with palms facing down to the floor until they are in line with your shoulders. The movement should be initiated with the muscles between the shoulder blades. Slowly return to the starting position.

**Exercise Variation:** Change hand position so that your thumbs are pointing up to the ceiling



10

### Prone on exercise ball “W” Exercise on Ball

*Repeat 2 sets of 10 repetitions.*

**Purpose:** to strengthen the muscles that control the shoulder blade and to improve your body's control of the shoulder in different positions.

**Instruction:** Lie on your stomach on an exercise ball with your feet braced on the floor and your back straight. Keep your head and neck in line with your back. Start with your arms in a “w” position, elbows bent below the shoulders and palms facing the floor. Pinch your shoulder blades together. Lift the forearms to the ceiling while maintaining the elbow position. The elbows should not rise above the plane of the body during the exercise. Slowly return to the starting position.

**Exercise Variation:** Change hand position so that the thumbs are pointing up towards the ceiling.



10

11

## Prone on exercise ball “L” Exercise on Ball

*Repeat 2 sets of 10 repetitions.*

**Purpose:** to strengthen the muscles that control the shoulder blade and to improve your body’s control of the shoulder in different positions.

**Instruction:** Lie on your stomach on an exercise ball with your feet braced on the floor and your back straight. Keep your head and neck in line with your back. Start with your arms in an “L” position, bend your elbows with your palms facing the floor. Pinch your shoulder blades together, while keeping them flat against the back. Lift the arms towards the ceiling. The elbows should not rise above the plane of the body during the exercise. The movement should be initiated with the muscles between the shoulder blades. Slowly return to the starting position.



**Exercise Variation:** Change hand position so that the thumbs are pointing up towards the ceiling.



12

## Prone on exercise ball “M” Exercise on Ball

*Repeat 2 sets of 10 repetitions.*

**Purpose:** to strengthen the muscles that control the shoulder blade and to improve your body’s control of the shoulder in different positions.

**Instruction:** Lie on your stomach on an exercise ball with your feet braced on the floor and your back straight. Keep your head and neck in line with your back. Start with your arms in an “M” position, bend your elbows with your palms facing the direction of your feet. Pinch your shoulder blades together, while keeping them flat against the back. Lift the arms towards the ceiling. The elbows should not rise above the plane of the body during the exercise. The movement should be initiated with the muscles between the shoulder blades. Slowly return to the starting position.



11

## Strengthening (cont.)

### 13

#### Push-up plus

*Repeat 2 sets of 10 repetitions or until too fatigued to continue.*

**Purpose:** To strengthen the muscles that control the shoulder blade and to improve control of the shoulder during weight bearing

**Instruction:** Lie on your stomach with palms flat on the ground at your sides. Push your body up from the ground with nothing except for your toes and hands touching the ground. As your elbows straighten to the end, separate your shoulder blades (try to push them away from each other) to lift your body up a little bit higher from the ground.

**Exercise Variation:** Place your hands on an unstable surface such as a sponge or a stability ball.



### 14

#### Elbow extension overhead triceps

*Repeat 2 sets of 10-12 repetitions.*

**Purpose:** To strengthen the muscles that straighten the elbow during movement.

**Instruction:** Stand with your arms above your head and elbows bent to 90°. Provide support at the elbow with your other hand. Straighten the elbow by pushing up towards the ceiling. Hold 2 seconds and lower slowly.



### 15

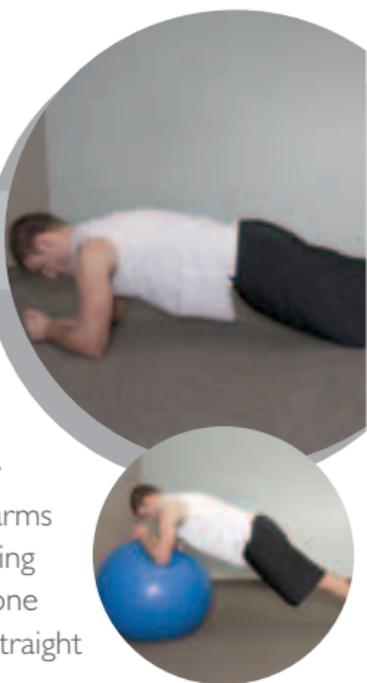
#### Plank

*Repeat 4-6 times.*

**Purpose:** To strengthen the core muscles which help generate muscle forces at the shoulder and to help core and shoulder stability.

**Instruction:** Lie on your stomach with your forearms and toes touching the floor. Forearms can be horizontal or vertical in position. Using your core muscles lift your entire body as one unit off the floor, so that your body is in a straight line. Hold this position for 15 seconds.

**Exercise Progression:** Place your forearms on a stability ball and your feet on the ground, hold the plank position while maintaining your shoulder blades flat on your back.



# 16

## Side Plank

*Repeat 4-6 times*

**Purpose:** To strengthen the core muscles which help generate muscle forces at the shoulder and to help core and shoulder stability.

**Instruction:** Lie on your side with your elbow bent and forearm touching the floor. Place your feet in a scissor position so that they are touching the floor. Using your core muscles lift your entire body as one unit off the floor, so that your body is in a straight line. Hold this position for 15 seconds.

**Exercise Progression:**

- i. Place your forearm on a stability ball, hold the side plank position while maintaining your shoulder blades flat on your back. Ensure you do not hike your shoulders.
- ii. In a straight plank position with your elbows straight, transition to a side plank with your elbows straight moving your body in a straight line as one unit. Transition slowly back to a straight plank then to the other side plank position.



# 17

## Prone rowing into External Rotation

*Repeat 2 sets of 10 repetitions.*

**Purpose:** To strengthen the muscles that control shoulder and shoulder blade movements during movement.

**Instruction:** Lie on your stomach with your arm hanging over the side of the table and your elbow straight. Slowly draw your shoulder blade back towards your spine, raise your arm while bending the elbow up to the level of the table. Pause one second. Rotate the shoulder upward towards the ceiling until your hand is even with the table, keeping your elbow at 90°. Hold for 2 seconds then slowly lower taking 2-3 seconds.



## Strengthening (cont.)

# 18

### Low Rows “press downs”

*Repeat 15 repetitions.*

**Purpose:** To strengthen the muscles that extend the shoulder during movement.

**Instruction:** Anchor a theraband above your shoulder level. Stand facing the theraband with your arm straight out in front of you at shoulder height and with your elbow straight. Start with your palms facing down to the floor at the end of the motion your palm should be facing backward. Keep your elbow straight, draw your arm down and back towards your body. Ensure that your shoulder blade stays flat on your back and that you do not hike your shoulder throughout the movement. Hold for 3-5s, slowly return to the start position.



# 19

### Wall Walk

*Repeat 3 sets of 5 repetitions.*

**Purpose:** To strengthen the posterior portion of the rotator cuff and the muscles that stabilize the shoulder blade.

**Instruction:** Tie a theraband into a continuous loop. Place the theraband around both of your forearms. Stand facing a wall, place your forearms on the wall at shoulder level, with tension on the band and palms facing inward. Slowly walk your hands up the wall while outwardly rotating the shoulders to move against the resistance of the theraband. Walk your arms up the wall until the elbows reach eye level then slowly walk back down to your start position.



# Flexibility

Range of motion limitations can lead to changes in patterns of movement. These changes increase the likelihood of musculoskeletal injuries and can impair performance. Good flexibility will allow the athlete to develop and maintain a smooth, efficient and effective pattern of movement in their particular sport.

## 1 Trunk Rotation

*Repeat 3 times on each side.*

**Purpose:** To improve range of motion of the upper back, this is important for participation in overhead activities.

**Instruction:** Sit on the floor with your knees bent and your buttock resting on your heels. Lean forward to touch your hands to the floor. Place one hand behind your head and rotate your upper back towards the ceiling. Direction of rotation is towards the hand behind the head. Hold 15-30 seconds and return to start position slowly.



## 2 Shoulder and Chest stretch

*Repeat 3 times on each side.*

**Purpose:** To improve or maintain range of motion of the chest and shoulder, which are important for overhead activities.

**Instruction:** Lie on your side with your knees bent and stacked one on top the other. Start with your hands in front of you at shoulder level and rotate your upper body and your top arm up and back until the arm touches the floor. Keep your knees in their original start position. If you arms do not touch the floor due to tightness, go as far as you can and hold in that position. Hold for 15-30 seconds and return to the start position slowly.



## Flexibility (cont.)

### 3

#### Latissimus dorsi stretch

*Repeat 3 times.*

**Purpose:** To improve range of motion of the shoulders in an overhead position.

**Instruction:** Lie on your back with both knees bent and heels on the floor. Raise both of your arms up towards your head with your palms facing up, thumbs pointing out. Hold for 15-30 seconds.



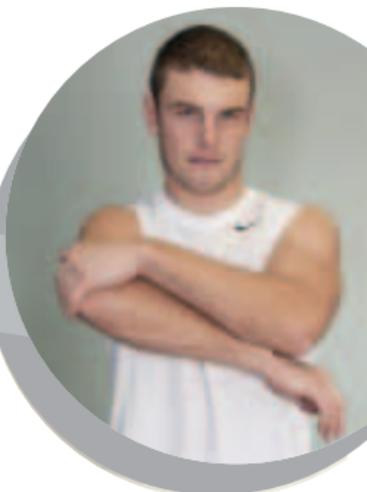
### 4

#### Posterior cuff stretch

*Repeat 3 times on each side.*

**Purpose:** To maintain range of motion of the posterior rotator cuff muscles, these muscles get tight with overhead sports.

**Instruction:** Fold your forearms one on top of the other (the arm being stretched should be under the top arm) in front of your body. Use the elbow of the top arm to push the hand of the stretching arm down to cause internal rotation of the shoulder. With the top hand holding the elbow of the stretching arm, pull the elbow gently across the body. Be sure you do not allow your body to twist or your shoulder to move forward. Hold for 15-30 seconds.



# Plyometric Exercises

(6-8reps, 2-4 sets, 2-3 x week)

Plyometric exercise training combines strength and speed of movement to enhance power and neuromuscular control and coordination. These concepts are used to produce movements at high speed and maximal force during overhead sports.

## 1 Wood chops

**Instruction:** With a medicine ball or weight in both hands. Start with both hands straight above your head. Move your hands in down towards the floor as you squat to the floor keeping your back straight.



## 2 Two handed chest pass

**Instruction:** Hold a medicine ball in both hands at chest level with your elbows bent and palms facing away from you. Throw the ball by straightening your elbows.



## 3 Two handed overhead throw with step lunge

**Instruction:** Stand in front of a step or box, with a medicine ball in both hands. Start with your hands above your head with elbows bent and feet side by side. Simultaneously, step onto the step with one leg and throw the ball from the overhead position. Repeat 8 reps on with each leg.



**Exercise Progression:** Step onto a BOSU ball.



## Plyometric Exercises (cont.)

### 4

#### One handed step and throw

**Instruction:** Place a small medicine ball in one hand. Stand with your feet side by side. Start with your arm at shoulder level, elbow bent to 90° and out to the side. Throw the ball while stepping forward with your opposite leg.



### 5

#### Prone horizontal ball flips

**Instruction:** Lie on your stomach, with your arm straight out to the side and palm facing down with a small medicine ball or weight in your hand. Keep your shoulder blades flat on your back while flipping the palm up and then down again repeatedly.



## **Cool Down**

An effective cool-down consists of activities that use similar muscles to the sport that was performed, but at a lower intensity. Perform this aerobic activity at about 50% intensity for approximately 5 minutes.

Example baseball cool-down: Casual throwing from about 20 feet for a few minutes and a light jog.

## **Summary**

Many injuries are preventable with some careful planning and regular performance of exercises. SHIPP is an evidence-based tool that can be easily implemented to reduce your risk of shoulder injuries throughout the season this year.

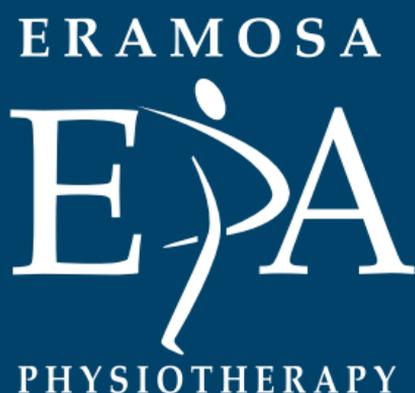
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