



## **Volleyball warm-up, strengthening program helps prevent injuries**

Whether played on the beach or in the gym, volleyball's popularity continues to grow. It ranks second in global participation behind soccer. Incorporating an in-season, plyometric strength and conditioning program into players' training routines will improve endurance and power for both men and women while helping to prevent injuries commonly associated with the sport—ankle and anterior cruciate ligament (ACL) sprains, patellar tendinitis (jumper's knee) and shoulder tendinitis.



Dr. Steven Chudik, orthopedic surgeon and sports medicine physician with the Steven Chudik Sports Medicine Injury Clinic and founder of the Sports Medicine Teaching/Research Foundation (OTRF), along with Larana Stropus, MS, ATC/L, and Keith Tesch, CSCS, CNT, developed a research-based, in-season exercise program designed specifically for volleyball. It reinforces proper jumping and landing mechanics, helps maintain jumping power throughout the season and reduces the likelihood of knee injury and overuse shoulder injuries. It also will help keep athletes from missing training and/or competition because the program targets areas that account for more the majority of volleyball injuries, as reported in published orthopaedic studies.

This in-season program begins with a dynamic warm-up—research shows benefits over static stretching—followed by only five different exercises with medicine balls alternating exercises every other day. The goals of the program are:

- To be easy to incorporate into a busy in-season schedule
- Avoids overuse by limiting repetitive movements
- Builds and maintains muscle mass without overloading the joints
- Limits the amount of additional jumping on hard surfaces

### **Common volleyball Injuries**

- Shoulder multidirectional instability (MDI): shoulder instability and discomfort result from laxity (looseness) of the supporting ligaments of the glenohumeral (shoulder) joint aggravated by repetitive overhead use of the shoulder.

- Rotator cuff tendinitis and impingement: an overuse injury caused by repeated contact of the rotator cuff tendons on the underside of the coracoacromial arch (bony and ligamentous roof of the shoulder).
- Suprascapular neuropathy: pain and weakness of shoulder results from compression or traction to the suprascapular nerve from repetitive overhead activity.
- Jumpers knee (patella tendinosis): pain and tenderness in the patella tendon where it attaches to the lower end of the patella resulting from repetitive jumping and overuse
- ACL tear in the knee (anterior cruciate ligament): typically caused by a jump landing on one leg.
- Ankle sprain: tearing of ligaments off the ankle joint after “rolling” the ankle

### **Precautions**

As with any exercise program, it is essential to maintain proper technique during the warm-up and exercises to receive maximum benefits and prevent injury. Professional coaching on overhead and landing mechanics also can further reduce the risk for injury.

## Warm-up

Warm-up	Weight	Sets	Repetitions	Rest
M Exercises	0-2 lbs	2	10	30 sec
W Exercises				
T Exercises				
1-Step Approach Jumps	Body Weight			60 sec
Tuck Jumps				

## Exercises (4 weeks)

### Day 1

Exercise	Weight	Sets	Repetitions	Rest
MB Backward Toss	F: 12-15 lbs M: 20-30 lbs	3	8	60 sec
MB Scoop Toss				
MB Rotation Toss				
1 Arm 90° Internal Rotation MB Toss	500 grams	2	12	30 sec
1 Arm 90° Internal Rotation MB Catch				

### Day 2

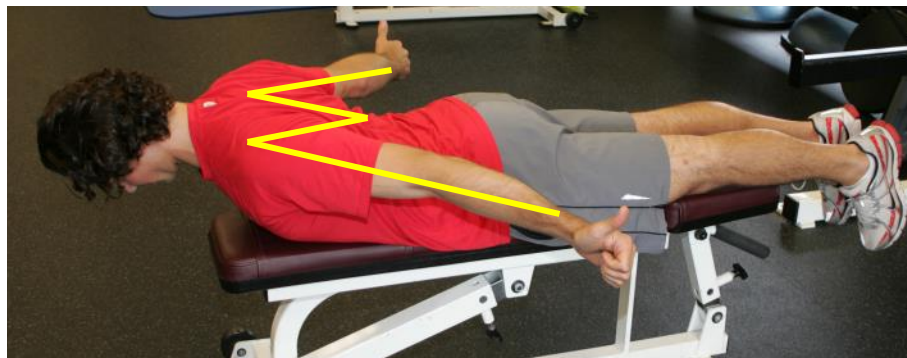
Exercise	Weight	Sets	Repetitions	Rest
MB Throwdown	F: 12-15 lbs M: 20-30 lbs	3	8 (*per leg)	60 sec
MB Broad Jump Pass				
1 Leg Push-off MB Press*				
1 Arm 90° Internal Rotation MB Toss	500 grams	2	12	30 sec
1 Arm 90° Internal Rotation MB Catch				

### IMPORTANT

As with any exercise program, it is essential to maintain proper technique during the warm-up and exercise to receive maximum benefits and prevent injury. Seek professional help on arm swing, jumping, and landing mechanics to learn pointers and stay injury free.

# Warm-up M Exercises

Weight	Sets	Repetitions	Rest
0-2 lbs	2	10	30 Seconds



1. Lay face down on a bench (as shown) with your head extending off the bench and your arms touching the floor.
2. Raise your arms and position your hands so your thumbs point toward the ceiling.
3. Squeeze your shoulder blades together and raise your arms toward the ceiling. Your upper body should take the form of an “M” during the exercise.
4. Lower your arms and repeat nine more times to complete one set.

**To increase the difficulty/intensity, use small hand weights during the exercise.**



# Warm-up W Exercises

Weight	Sets	Repetitions	Rest
0-2 lbs	2	10	30 Seconds

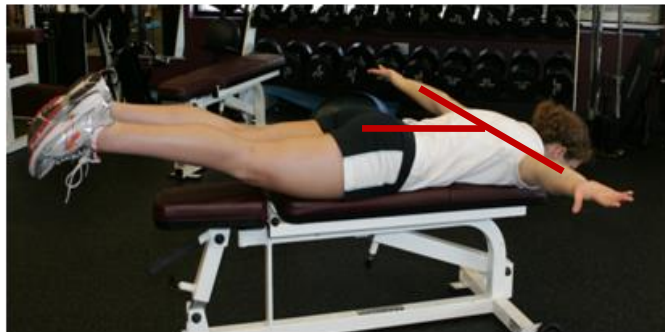


1. Lay face down on a bench (as shown) with your head extending off the bench and your arms touching the floor.
2. Raise your arms and position your hands so they are open and your palms point toward the floor.
3. Squeeze your shoulder blades together and raise your arms toward the ceiling. Your upper body should take the form of an “W” during the exercise.
4. Lower your arms and repeat nine more times to complete one set.

**To increase the difficulty/intensity, use small hands weights during the exercise.**

# Warm-up T Exercises

Weight	Sets	Repetitions	Rest
0-2 lbs	2	10	30 Seconds



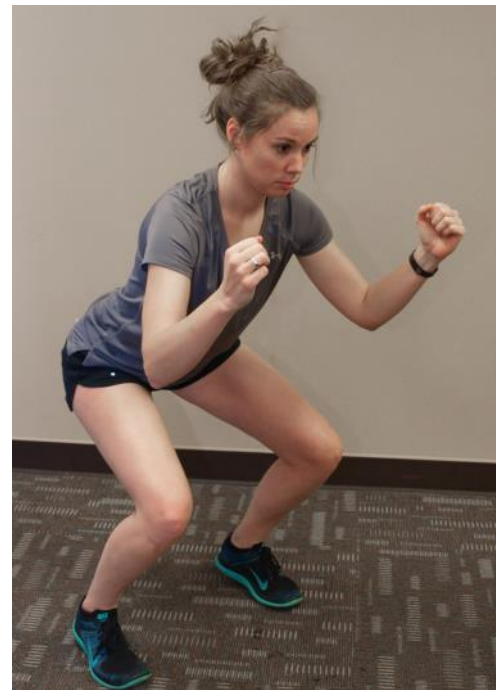
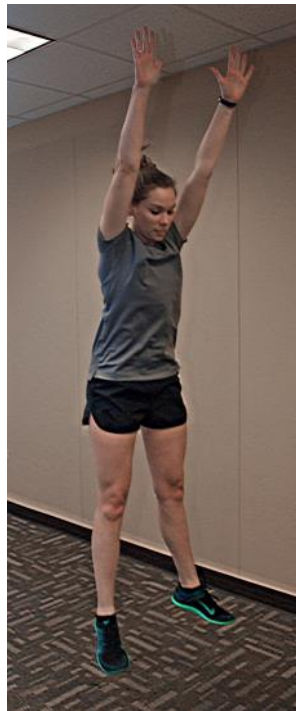
1. Lay face down on a bench (as shown) with your head extending off the bench and your arms touching the floor.
2. Raise your arms and rotate your hands so your palms face toward the ceiling.
3. Squeeze your shoulder blades together and raise your arms toward the ceiling. Your upper body should take the form of an “T” during the exercise.
4. Lower your arms and repeat nine times to complete one set.

**To increase the difficulty/intensity, use small hand weights during the exercise.**

## Warm-up

# 1-Step Approach Jumps

Weight	Sets	Repetitions	Rest
Body Weight	2	10	60 Seconds



1. Stand with feet shoulder-width apart and knees slightly bent.
2. Step forward with your non-dominant foot.
3. As you bring your dominant foot forward, begin to squat down and jump off both feet as they return to shoulder-width apart, throwing your arms up into the air straight above your head.
4. Land softly with arms slightly bent at your side and knees shoulder-width apart and slightly bent. Repeat nine more times to complete one set.

# Warm-up

## Tuck Jumps

Weight	Sets	Repetitions	Rest
Body Weight	2	10	60 Seconds

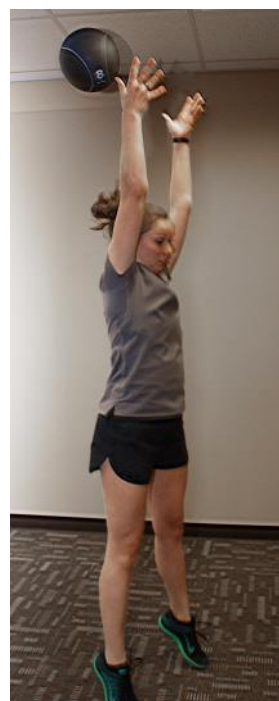
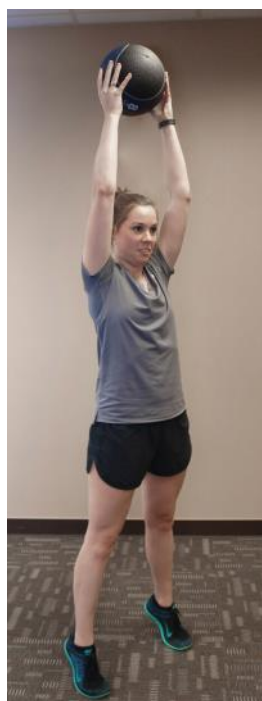


1. Stand with both feet shoulder-width apart.
2. Squat down evenly on both legs and jump up attempting to tuck both knees into your chest.
3. Land softly on the ground with both knees slightly bent.
4. Return to the starting position and repeat the exercise nine more times to complete one set.

# Day 1 Exercise

## MB Backward Toss

Weight	Sets	Repetitions	Rest
<b>F: 12-15 lbs M: 20-30 lbs</b>	<b>3</b>	<b>8</b>	<b>60 seconds</b>



1. Squat with a medicine ball in your hands hanging between your legs down near your knees.
2. Begin by thrusting the hips forward as you extend through the legs, jumping up.
3. As you do, swing your arms up and over your head, keeping them extended, releasing the ball just past the peak of your movement.
4. The goal is to throw the ball as far behind you as possible.
5. Be careful when letting the ball drop to the ground. Repeat seven more times to complete one set.



# Day 1 Exercise

## MB Scoop Toss

Weight	Sets	Repetitions	Rest
<b>F: 12-15 lbs M: 10-20 lbs</b>	<b>3</b>	<b>8</b>	<b>60 seconds</b>

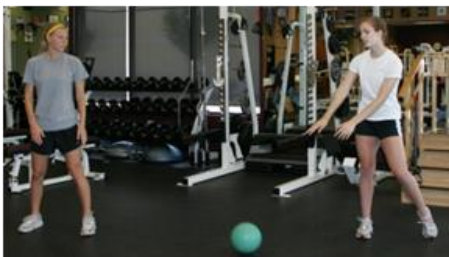


1. Squat with a medicine ball in your hands hanging between your legs down near your knees.
2. Begin by thrusting the hips forward as you extend through the legs, jumping up.
3. As you do, swing your arms up and over your head, keeping them extended, releasing the ball at the peak of your movement.
4. Be careful when letting the ball drop to the ground. Repeat seven more times to complete one set.

# Day 1 Exercise

## MB Rotation Toss

Weight	Sets	Repetitions	Rest
<b>F: 12-15 lbs M: 20-30 lbs</b>	<b>3</b>	<b>8</b>	<b>60 seconds</b>



1. The thrower starts with feet shoulder-width apart. The ball is held overhead and on the outside of the body away from the catcher.
2. The catcher starts with feet shoulder-width apart and arms down at their side.
3. The thrower brings the ball across their body and releases the ball at their opposite hip.
4. The ball should hit halfway between the partners.
5. The catcher receives the ball gently at their hip and continues to move the ball above the side of their head opposite of their partner.
6. Repeat the exercise to return the ball to the original thrower.
7. Repeat until each partner has thrown the ball eight times to complete one set.

# Day 1 Exercise

## 1 Arm 90° Internal Rotation MB Toss

Weight	Sets	Repetitions	Rest
500 grams	2	12	30 seconds



1. The catching partner starts behind the thrower on their throwing side. The distance apart will vary with ability to complete the exercise properly.
2. The throwing partner starts on one knee with their throwing arm out to their side at 90° and hand out in front. You should rest on the knee of the throwing-arm side.



3. Keeping the arm at 90°, the thrower tosses the ball backward, targeting the catcher's hand.
4. Repeat 11 more times to complete one set. Complete the exercise on both arms.



# Day 1 Exercise

## 1 Arm 90° Internal Rotation MB Catch

Weight	Sets	Repetitions	Rest
500 grams	2	12	30 seconds



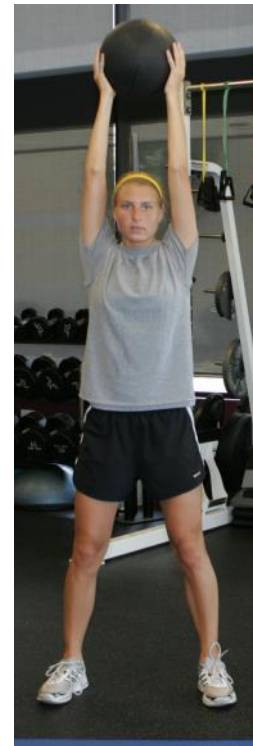
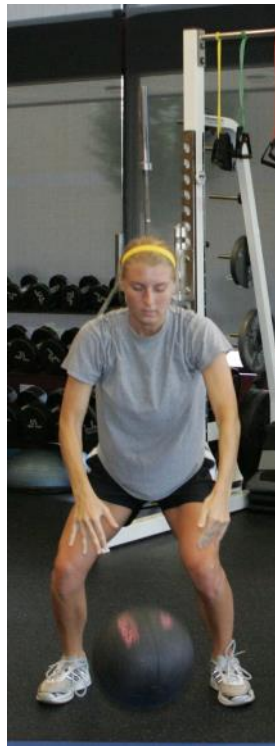
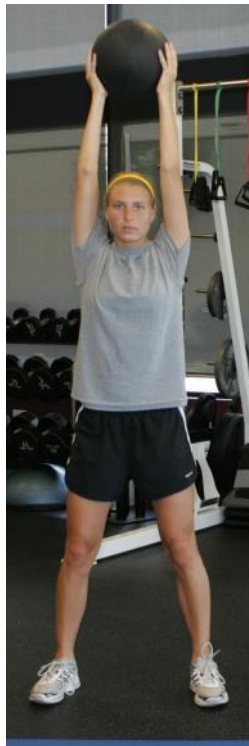
1. The throwing partner starts behind the catcher on their catching side. The distance apart will vary with ability to complete the exercise properly.
2. The catching partner starts on one knee with their catching arm out to their side at 90°. You should rest on the knee of the catching-arm side.
3. The thrower tosses the ball underhand, targeting the catcher's hand.
4. Keeping the arm at 90°, the catcher will snatch the ball as it nears their hand while bringing the arm forward. Repeat 11 more times to complete one set.
5. Complete the exercise on both arms.



## Day 2 Exercise

# MB Throwdown

Weight	Sets	Repetitions	Rest
<b>F: 12-15 lbs M: 20-30 lbs</b>	<b>3</b>	<b>8</b>	<b>60 seconds</b>

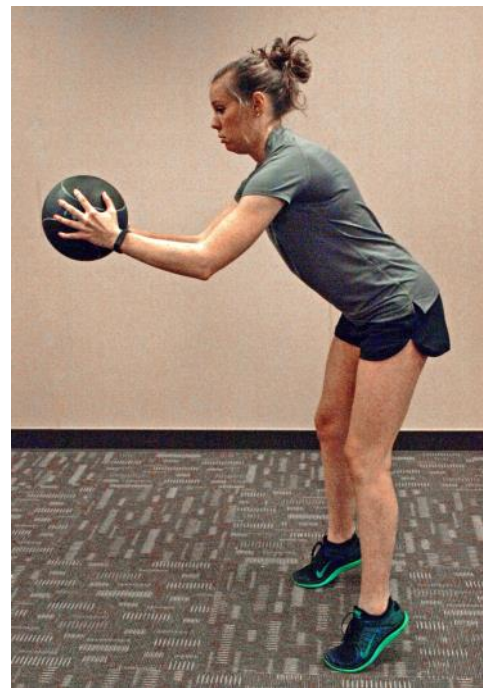


1. Stand with feet shoulder-width apart.
2. Hold the medicine ball above your head with straight arms.
3. Forcefully bring your arms down in front of your body and let go of the ball when your arms are almost completely lowered.
4. Aim to hit the ground directly between your feet about a foot in front of you.
5. Catch the ball as it bounces back to you. Repeat seven times to complete one set.

## Day 2 Exercise

# MB Broad Jump Pass

Weight	Sets	Repetitions	Rest
<b>F: 12-15 lbs</b> <b>M: 20-30 lbs</b>	<b>3</b>	<b>8</b>	<b>60 seconds</b>



1. Stand in a semi-squat position with the medicine ball held near the body at chest level with palms facing away from your body.
2. Simultaneously jump as far forward as possible and push the ball as far forward as possible, extending the arms straight out, parallel to the floor.
3. Use both arms with equal effort. Do not favor one side.
4. Repeat seven more times to complete one set.

## Day 2 Exercise

# 1 Leg Push-off MB Press

(\*per leg)

Weight	Sets	Repetitions	Rest
<b>F: 12-15 lbs M: 20-30 lbs</b>	<b>3</b>	<b>8*</b>	<b>60 seconds</b>



1. Stand on only your left leg.
2. Place both hands out in front with a medicine ball for balance.
3. Extend your right leg and squat down as far as possible without losing site of your left foot.
4. Slowly return to the starting position. Repeat exercise seven more times, then switch to the right leg to complete one set.

## Day 2 Exercise

# 1 Arm 90° Internal Rotation MB Toss

Weight	Sets	Repetitions	Rest
500 grams	2	12	30 seconds



1. The catching partner starts behind the thrower on their throwing side. The distance apart will vary with ability to complete the exercise properly.

2. The throwing partner starts on one knee with their throwing arm out to their side at 90° and hand out in front. You should rest on the knee of the throwing-arm side.



3. Keeping the arm at 90°, the thrower tosses the ball backward, targeting the catcher's hand.

4. Repeat 11 more times to complete one set. Complete the exercise on both arms.





## Day 2 Exercise

# 1 Arm 90° Internal Rotation MB Catch

Weight	Sets	Repetitions	Rest
500 grams	2	12	30 seconds

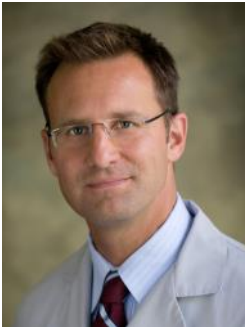


1. The throwing partner starts behind the catcher on their catching side. The distance apart will vary with ability to complete the exercise properly.
2. The catching partner starts on one knee with their catching arm out to their side at 90°. You should rest on the knee of the catching-arm side.
3. The thrower tosses the ball underhand, targeting the catcher's hand.
4. Keeping the arm at 90°, the catcher will snatch the ball as it nears their hand while bringing the arm forward. Repeat 11 more times to complete one set.
5. Complete the exercise on both arms.

## **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 so they can compete and perform at their highest level and ability.

This program is based upon research which found athletes need to incorporate specific exercises into their weekly training schedules not only to maintain strength, but more important, help minimize injuries. To maximize the benefit 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 Shoulder and Knee Injury Clinic, Dr. Chudik is the founder and president of the Orthopaedic Sports Medicine Teaching and Research Foundation (OTRF) and an associate professor at Loyola School of Medicine.



### **Keith Tesch, CSCS, CNT**

For more than ten years, Keith has been in the fitness industry working as a personal trainer and sports performance specialist, a position he currently holds. During the past five years, his focus has been helping individuals regain their strength and range of motion through research-based programs.



### **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

To assist coaches, athletic trainers, players and parents, Dr. Chudik, a board-certified orthopaedic and sports medicine physician, has urgent appointments for injured athletes. An on site X-ray suite and an open-bore, high-field magnetic resonance imaging (MRI) machine expedites proper diagnosis and treatment. To schedule an appointment with Dr. Chudik call 630-324-0402.

### About OTRF

Steven Chudik, orthopaedic surgeon and sports medicine physician with the Steven Chudik Shoulder and Knee Injury Clinic, 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.

Dr. Chudik has seen a growing demand by patients, athletic trainers and clinicians for up-to-date medical information and unbiased research on injury prevention—especially for children—as well as facts on arthritis and wear and tear on joints, cartilage, tendons, ligaments, etc. To fulfill these requests, OTRF produces and distributes an E-newsletter, shares information about health performance-related issues like nutrition and fitness, hosts athletic training educational programs, conducts seminars for healthcare providers and the community and most important, funds unbiased research and development particularly in emerging areas such as arthroscopic and minimally invasive surgery for injuries to the meniscus, labrum, rotator cuff, ACL and cartilage.

#### **Volleyball warm-up, strengthening program helps prevent injuries**

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Athletic Models

However, none of this is possible without ongoing financial support. We are extremely grateful to all those who have contributed in the past. Many of the donations came from patients or their family members who benefited from Dr. Chudik's orthopaedic and sports medicine expertise.

If you are interested in helping OTRF fund education and research programs, please contact Dr. Chudik at 630-324-0402. Also, many companies sponsor programs that match charitable donations made by employees. Some even match retirees' and/or spouses' donations. Matching gift programs are a great way to double your generosity. Regardless of the amount, every contribution helps make a difference today and for years to come.

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## 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 a 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.

This in-season volleyball stretching and conditioning program 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.

## Sports Medicine Injury Clinic

**Monday Evenings**  
**Call 630-324-0402**

### Sign Up Today!

Don't miss another issue of **Active Bones**, a monthly E-newsletter from OTRF. Each issue is filled with information to help you stay healthy and live an active life. Simply email: [contactus@chudikmd.com](mailto:contactus@chudikmd.com) to receive the next issue of **Active Bones**.



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