Active Bones

NOVEMBER 2011

ORTHOPAEDIC SURGERY AND SPORTS MEDICINE
TEACHING AND RESEARCH FOUNDATION

THIS ISSUE INCLUDES:

- Basketball Strength Maintenance Program
- Plyometrics for Athletes

Newsletter Designed with You in Mind

For the past five years, ***Active Bones***, the monthly newsletter produced by Dr. Steven Chudik's Sports Medicine Teaching and Research Foundation (OTRF), has been educating patients, athletes, clinicians, physicians and consumers about musculoskeletal injuries, injury prevention, health performance, and orthopaedic research and development. As we prepare our 2012 editorial calendar, we'd appreciate your input on topics you'd like to see covered in future issues. Send your suggestions by fax, email or mail to:

Dr. Steven Chudik, OTRF
Hinsdale Orthopaedic Associates
1010 Executive Court, Suite 250
Westmont, IL 60559
Fax: 630-920-2382 | Email: stevenchudikmd@gmail.com

This month, our focus is on in-season strength and conditioning for basketball players. Typically a basketball season is long and grueling. To help ensure athletes perform at their best and avoid injury, Dr. Steven Chudik along with Keith Tesch, CSCS, CNT, and Larana Stropus, MS, ATC/L, developed a quick and efficient plyometric exercise program contained on the following pages. However, not all exercises are appropriate for everyone, especially if there is a history of hip, knee, ankle, shoulder, elbow, wrist or neck/back problems. Before beginning our program, athletes should consult their physician and if cleared, remember to always warm up several minutes before starting.

TO RECEIVE THIS NEWSLETTER DIRECTLY
Please call 1-630-794-8668 or email us at stevenchudikmd@gmail.com

Incorporating an In-season Basketball Strength Maintenance Program

By Steven C. Chudik, MD, SSC – Orthopaedic Surgery and Sports Medicine Teaching and Research Foundation;
Keith Tesch, CSCS, CNT – ATI Physical Therapy; **Larana Stropus, MS, ATC/L** – Hinsdale Orthopaedics

During the long basketball season, injuries and fatigue can affect a player's performance and the success of the entire team. To help prevent this from occurring, Dr. Steven Chudik, orthopaedic surgeon and sports medicine physician at the Steven Chudik Shoulder & Knee Injury Clinic and founder of the Sports Medicine Teaching/Research Foundation, recommends incorporating an in-season program of low-level plyometrics and strength exercises into basketball players' schedules. Plyometrics have been shown to help athletes maintain their peak strength, power and performance. In the May 2008 ***Journal of Strength and Conditioning Research,*** investigators reported that basketball players who participated in a two-day per week, in-season strength and plyometric program improved on four different performance measurements including their vertical jump.

An in-season strength maintenance program should be quick, efficient and timed appropriately. It requires some planning to properly schedule workouts around games and practice schedules and avoid training too close to a specific competition and negatively impacting performance. In season, schedule two days for full-body workouts at least 20- to 30-minutes in duration. Players should perform strength workouts after a game or practice and plyometric workouts before any conditioning because fatigue affects proper form. Ideally, players should have 48-hours rest between workouts and 48-hours rest between workouts and games.

Precautions

With any exercise program, it is very important to follow precautions and maintain proper form. This is especially important with plyometrics because they are impact exercises which may cause injury if done incorrectly. This most often occurs on landings if players don't come down softly on their toes and roll their weight to the heels or twists a knee. To minimize injury, these safety precautions should be followed:

- Athletes should be well conditioned with a high level of leg strength.
- Warm up thoroughly before starting if not done after a game or practice.

Strength Maintenance Program *continued*

- Start slowly with small jumps and gradually build.
- Land softly to absorb the shock.
- Perform the exercises on cushioned surfaces and wear shoes with plenty of cushioning.
- Allow rest time between workouts.
- Stop immediately if there is any pain.

Maintenance Program Guidelines

When using the in-season basketball strength maintenance program, it is important athletes rest 48-hours between the first and second workout and rest 48-hours between workouts and a game. Also, these workouts should be done after a game or practice, but before any conditioning so fatigue doesn't affect proper form and risk injury. During the season, plan for two days of full-body workouts that are 20-30 minutes in length.

The purpose of a low repetition (rep) maintenance program is not to go until fatigue occurs, but to be just heavy enough to maintain absolute strength. So, start by finding that point, or approximately 85 percent of your 1-rep max. This is done by first determining 100 percent of your 1-rep max. A safe approach to calculating this is by performing a 3-rep max and then use the formula below to get the estimated 100 percent of your 1-rep max.

Take the 3-rep max weight and multiply it by 1.1 to get 100 percent of the 1-rep max.

Athlete Example: 3-rep max = 250 lbs.
250 lbs. x 1.1 = 275 lbs.
1-rep max = 275 lbs.
275 lbs. x .85 percent = 234 lbs (85% of 1-rep max)

WARM-UP PROGRAM

Exercise	Sets	Reps/ Time	Rest Between Sets	% 1-Rep Max
Jump Rope	2	1 min.	30 sec.	
Push-Ups	1	15	30 sec.	
Side Squats	1	5 per leg	30 sec.	
Bent Over Row	1	8	30 sec.	70%

Maintenance Program

The exercises below are to be followed based on the level of experience and age of each athlete. Perform the last three exercises for each workout in a circuit format—one after the other, then repeat. All the others are done one at a time for the number of sets and reps/time indicated.

FIRST WORKOUT

Exercise	Sets	Reps/ Time	Rest Between Sets	% 1-Rep Max
High Pull from Hang	3	4	2 min.	85%
Split Jump	3	30 sec.	30 sec.	
2- to 1-Leg Jump	3	30 sec.	30 sec.	
180˚ Jump	2	60 sec.	30 sec.	
A) Plank Leg Lift	Repeat Circuit 2 Times	40 sec.	No rest, continue to next circuit exercise	
B) Bench Press		4		85%
C) Bent Over Row		4	Rest 30 seconds after completing circuit	85%

SECOND WORKOUT

Exercise	Sets	Reps/ Time	Rest Between Sets	% 1-Rep Max
Barbell Push Press	3	4	2 min.	85%
1-Leg Lateral Hop	3	30 sec.	30 sec.	
Alternate 1-Leg Bound	3	30 sec.	30 sec.	
2- to 1-Leg 90˚ Hop	2	60 sec.	30 sec.	
A) Side Plank Leg Lift	Repeat Circuit 2 Times	40-60 sec.	No rest, continue to next circuit exercise	
B) Pull Down/Chin-Up*		4		*Add 10% of body weight
C) Side Lunge		5 each leg	Rest 30 seconds after completing circuit	

**If the athlete can do more than four chin-ups, use ankle weights, a vest or hold a dumbbell between feet to increase difficulty.*

Strength Maintenance Program *continued*

HIGH PULL FROM HANG

1. Adjust the weight to 85 percent of 1-rep max (see calculations on page 3).
2. Stand with your feet shoulder-width apart. Grab the bar in an overhand grip with your hands positioned just outside your knees.
3. With your back flat, raise the bar to just below your knees. Your shoulders should be over the bar with your arms straight and elbows facing out. Your weight should be in the heels with your knees slightly bent and hips pushed back.
4. Straighten your hips, knees and ankles while bringing the bar up in an explosive vertical pull.
5. Shrug your shoulders to bring the bar up to your chest.
6. Lower the bar and repeat.

SPLIT JUMP

1. Start in a lunge position with your arms in a running form.
2. Jump straight up pushing off your front heel and back toe.
3. While in the air, switch legs so you land with the other foot forward. Remember to keep our chest up.
4. Bend the back knee as you land on the floor and explode back into the air landing with the other foot forward.

2- to 1-LEG JUMP

1. Start in a semi-squat position standing on both feet as shown.
2. Keep your arms at your sides and slightly behind your knees.
3. Begin to swing both arms forward and jump off both feet.
4. Land softly on one foot in a semi-squat position.
5. Repeat the exercise landing on the opposite foot.
6. Continue the exercise alternating landing legs.

Strength Maintenance Program *continued*

180° JUMP

1. Start in a semi-squat position standing on both feet as shown with your arms at your sides and slightly behind your knees.
2. From this position, jump up and rotate your body 180°. Lead the rotation with your hips.
3. Land softly back in the semi-squat position.
4. Quickly jump back to the right and land softly returning your body to the original starting position.
5. Repeat alternating the turning direction—right, then back to the left.

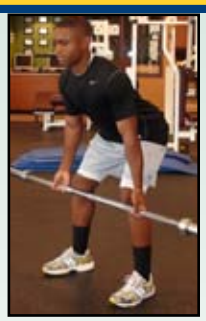
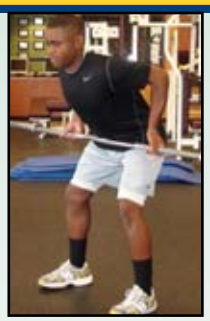
CIRCUIT A – PLANK LEG LIFT

1. Lie on your stomach with your elbows positioned directly under your shoulders.
2. Lift your hips off of the floor until they are even with your shoulders.
3. Tighten your butt (gluteus maximus) and abdominal (abs) muscles as you lift one foot off the floor. Remember to keep your back flat.
4. Hold for 40-seconds, and then return your foot to the floor.
5. Repeat alternating legs.

CIRCUIT B – BENCH PRESS

1. Adjust the weight to 85 percent of 1-rep max (see calculations on page 3).
2. With both feet on the floor, lie on your back with your head, shoulders and hips touching the bench.
3. Bend your arms at your elbows so they are at 90° to your shoulders.
4. Place your hands on the bar directly above your elbows.
5. Put your ring fingers on the smooth loop to ensure proper arm spacing.
6. Lift the bar off the rack and lower it until your elbows are even with shoulders. **Note:** The bar may touch the chest only if elbows are even with shoulders.
7. Push the bar up evenly with both arms until they are straight. Stop, then lower and repeat.

Strength Maintenance Program *continued*

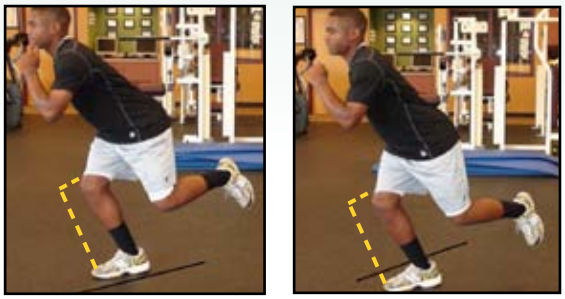



CIRCUIT C – BENT-OVER BARBELL ROLL

1. Adjust the weight to 85 percent of 1-rep max (see calculations on page 3).
2. Stand with your feet shoulder-width apart.
3. Grab the bar with an underhand grip placing your hands just outside your knees.
4. Without arching your back, pull the bar up to your knees.
5. Squeeze your shoulder blades together as you continue to raise the bar.
6. Lower the bar to hip level to end the exercise.
7. Repeat as indicated above to reach desired set and repetitions.

BARBELL PUSH PRESS

1. Adjust weight to 85 percent of 1-rep max (see calculations on page 3).
2. Grab the bar barbell with both hands and stand with your feet shoulder-width apart.
3. Using proper posture, bring the bar to chest level.
4. Quickly push your hips back, bend your knees slightly and without pausing, explode vertically pushing the bar overhead as your rise on your toes.
5. Drop down on your heels as you straighten your arms. Push your head slightly in front of the bar as your reach back with your arms.
6. Pause and repeat to reach sets and repetitions.



1-LEG LATERAL HOP

1. Place a tapeline on the floor.
2. Stand on your right leg in a semi-squat stance next to the line.
3. Jump sideways over the line* landing on the same foot controlling the landing, then jump back.
4. Remember to keep your knees behind your toes when landing.
5. If doing this exercise quickly, stay on the ball of your foot.
6. Change legs and repeat.

***Note:** If athlete is more advanced, a low object can be substituted for the tapeline.

Strength Maintenance Program *continued*

ALTERNATE 1-LEG BOUND

1. Stand on your right leg in a semi-squat position.
2. Jump forward and to the left.
3. Land softly on your left leg in a semi-squat position. Remember to keep proper form during each jump.
4. Repeat left to right leg.

2- to 1-LEG 90° HOP

1. Start in a semi-squat position standing on both feet as shown with your arms at your sides and slightly behind your knees.
2. Jump up rotating your body to the left 90°. Land softly on the left foot maintaining a running position.
3. Return to start position and repeat landing on the right foot.
4. Continue to repeat steps alternating the direction of rotation and landings.

CIRCUIT A – SIDE PLANK LEG LIFT

1. On the floor, lie on your side with your elbow directly under your shoulder and your feet stacked one on top of the other.
2. Lift your hips off the floor until your body is in a straight line keeping your hips forward and in line with your legs and torso.
3. Once you are able to hold this position for 40-seconds, raise your top leg off your bottom leg to increase difficulty. Do not allow your hips to rotate forward or backward.
4. Lower yourself back to the floor and repeat repetitions alternating legs.

Strength Maintenance Program *continued*

CIRCUIT B (OPTION 1) – LAT PULL-DOWN

1. Adjust the machine weight.
2. Sit with both feet on the ground and position yourself so you are away from the machine slightly less than the length of your upper arm.
3. Reach up and grab the bar with both hands using an overhand grip.
4. Pull your shoulders down keeping your elbows out.
5. Pull the bar down until it is just below your chin while pulling your shoulders back and keeping your elbows tucked in.
6. Slowly raise your arms back over your head and repeat.

CIRCUIT B (OPTION 2) – CHIN-UP

1. Using a chin-up bar, jump up and grab it with your palms facing towards you.
2. Cross your ankles—one over the other.
3. Pull yourself up, keeping your body at a slight angle.
4. Pull yourself high enough to touch your chest to the bar making sure to keep your shoulders pushed backwards.
5. Pause. Lower yourself and repeat.

CIRCUIT C – SIDE LUNGE

1. Stand with your feet hip-width apart.
2. Keep your right leg straight as you bend your left knee to a squat position.
3. Maintain proper squat form, remembering to keep the knee behind your toes.
4. Push off with your left foot—heel to toe—and return to the standing start position.

Note: To make the exercise more difficult for your legs and challenge your core, hold a plate with both hands keeping it level throughout the exercise.

Strength Maintenance Program *continued*

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 basketball maintenance program provided in this newsletter 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.

Plyometric Training for Athletes

The in-season basketball strength maintenance program detailed in this issue includes plyometric exercises. The term plyometrics is frequently misused, misunderstood and sometimes even feared by athletes, coaches and parents. Plyometrics however, when used properly with other types of training, can be an excellent way to improve athletic performance and prevent injury. Plyometrics is a training method for developing explosive power. Explosive power is demonstrated in athletic activities such as a basketball when a player jumps for a rebound, in tennis when a player serves, or in track when a sprinter comes out of the starting blocks. Because so many sports call for explosive power, it makes sense to include plyometric training techniques for most competitive athletes.

To appreciate the benefits of plyometric training, it is helpful to understand how muscles work. There are two types of muscle contraction—concentric (positive) and eccentric (negative). During a concentric muscle contraction, such as curling a dumbbell (biceps) or standing from a squat position (quadriceps, gluteus maximus), the muscle fibers shorten. During an eccentric muscle contraction, such as lowering the dumbbell curl (biceps) or squatting (quadriceps, gluteus maximus), the muscle fibers lengthen. Plyometric training incorporates eccentric (negative) muscle extension followed immediately by explosive concentric (positive) muscle contraction. For example, jumping back on a box immediately after jumping off is an excellent plyometric exercise that can help increase an athlete's vertical leap for sports like volleyball and basketball. By including plyometric exercises like the box jump helps train muscles to better perform the explosive movements required during athletic competition.

Performing plyometric exercises, or any explosive athletic activity, carry some injury risk. However, if performed correctly with proper warm up and technique, plyometrics may actually help prevent injury during competition. Recent research shows plyometric training can be performed safely by children as young as age 12—if done properly. Injuries most frequently occur from trying to utilize a "one size fits all" plyometric program for a group of athletes.

Keys to a safe plyometric program

1. Assess each athlete's ability to perform plyometric drills.
2. Use a logical progression from easy to more difficult activities based on each athlete's performance.

Plyometric Training for Athletes *continued*

3. Ensure each activity is performed using proper technique.
4. Warm-up properly before starting a plyometric program.

There are references available to assist with the development of a plyometric program. These include books such as ***High Powered Plyometrics*** by James C. Radcliffe and Robert C. Farentinos; ***Essentials of Strength Training and Conditioning*** edited by Thomas R. Baechle and videos such as ***Jump! Jump! Jump!*** by Vern Gambetta and Steve Odgers. Also, you can consult with Dr. Steven Chudik, orthopaedic surgeon and sports medicine physician at the Steven Chudik Shoulder and Knee Injury Clinic and founder of the Sports Medicine Teaching/Research Foundation as well as his staff. To contact Dr. Chudik or his staff you can email them at stevenchudikmd@gmail.com.

New MRI Speeds Diagnosis, Treatment

During the past ten years, Dr. Steven C. Chudik, an orthopaedic surgeon specializing in shoulder and knee injuries, has successfully treated thousands of injured athletes of every age. For those in need of Dr. Chudik's orthopaedic expertise, diagnosis and treatment are now quicker with the arrival of a Siemens high field, open-bore magnetic resonance imaging (MRI) machine at his Westmont office location.

"The key to returning a patient back to their active lifestyle is a prompt and accurate diagnosis so they can begin the correct treatment pathway right away," explained Dr. Chudik. "The availability of an onsite MRI with advanced imaging capability allows us to do this faster."

According to Dr. Chudik, the Clinic has a therapy center and an X-ray suite to help facilitate patient care, but the addition of the MRI allows him to more accurately see soft-tissue, ligament and cartilage injuries and make an immediate diagnosis. This permits Dr. Chudik to begin treatment immediately rather than delaying his diagnosis and initiation of treatment for days or weeks waiting for results to be sent from a hospital or other MRI center.

"The addition of the MRI also is a tremendous advantage for the athletes I see in my Clinic," said Dr. Chudik. "The Clinic has been addressing the needs of injured athletes on Monday evenings from 6 p.m. to 8 p.m. for the past ten years and was established to ensure prompt diagnosis and treatment by an orthopaedic surgeon board-certified in orthopaedic sports medicine," he explained.

The new MRI has a 70 cm opening, the largest of any design, which makes it less tunnel-like. It also has the shortest bore length so most patients can have their heads outside the machine during the imaging process.

"We are pleased to provide this advanced diagnostic service as part of our full-service, sub-specialty orthopaedic practice and understand the peace of mind it can bring to patients, parents, athletic trainers and coaches knowing we offer complete, efficient and excellent care to expedite an athlete's safe return to their sport," Dr. Chudik said.

ORTHOPAEDIC SURGERY AND SPORTS MEDICINE
TEACHING AND RESEARCH FOUNDATION





Yes, I would like to contribute to the Orthopaedic Surgery and Sports Medicine Teaching/Research Foundation (OTRF).

Name_____

Address_____

City_____

State_____ Zip_____

Amount contributed $_____ ❑ Check Enclosed

Mail to: OTRF
c/o Dr. Steven Chudik
Hinsdale Orthopaedic Associates
1010 Executive Court, Suite 250
Westmont, IL 60559

❑ Charge ❑ Master Card ❑ Visa ❑ Discover
❑ American Express

Account Number_____

Expiration Date_____

Name on Card_____

Signature of Card Holder_____

❑ Check if you wish your donation to be anonymous

❑ Check if you wish to make this contribution in memory of an individual

Name of the individual_____

Name and address of individual to notify of your contribution_____

_____

_____

Thank you for your support!

Orthopaedic Surgery and Sports Medicine Teaching and Research Foundation Helps People Stay Active and Healthy

Dr. Steven Chudik, orthopaedic surgeon and sports medicine physician with the Steven Chudik Shoulder & Knee Injury Clinic, founded the Orthopaedic Surgery and Sports Medicine Teaching and Research Foundation (OTRF) in 2007. OTRF is a nonprofit, 501 C3 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 by patients, athletic trainers and clinicians 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. To meet these needs, OTRF produces and distributes this newsletter, shares information about health performance-related issues such as 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.

However, none of this is possible without financial support. OTRF has been fortunate to receive several large donations in the past such as $20,000 from the Arthroscopy Association of North America, but mostly it is the small donations from individuals that help us continue our work. Many of these donations are no larger than the cost of a Starbuck's coffee and come from patients or their family members who benefited from Dr. Chudik's orthopaedic and sports medicine expertise. If you, or anyone you know, might be interested in contributing to help us continue our work, please speak with Dr. Chudik, one of his assistants, or use the form on the left. No matter the amount, each contribution helps make a difference.

Thank you for your interest in our newsletter, ***Active Bones***, and the work of OTRF.

Steven C. Chudik, MD
Orthopaedic Surgeon and Sports Medicine Physician
OTRF Founder and President

ORTHOPAEDIC SURGERY AND SPORTS MEDICINE
TEACHING AND RESEARCH FOUNDATION