

Basketball

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.

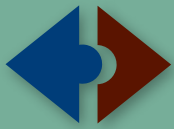
An in-season strength maintenance program should be quick, efficient and timed appropriately. It requires some planning to properly schedule workouts around games and practice schedules and avoid training too close to a specific

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.

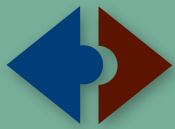
FIRST WORKOUT

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	85%
B) Bench Press		4		
C) Bent Over Row		4	Rest 30 seconds after completing circuit	

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	*Add 10% of body weight
B) Pull Down/Chin-Up*		4		
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.



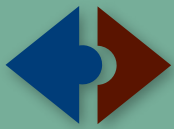
SPLIT JUMP

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.



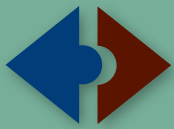
CIRCUIT A – PLANK LEG LIFT

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*



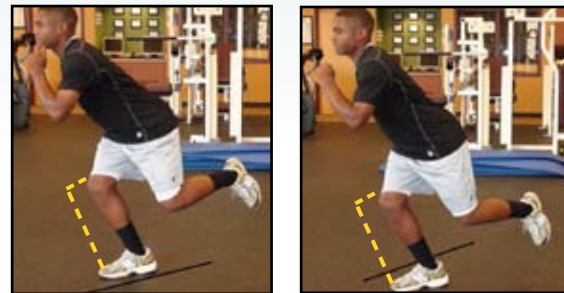
CIRCUIT C – BENT-OVER BARBELL ROLL

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

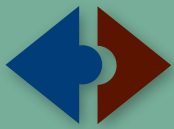
1. Adjust weight to 85 percent of 1-rep max (see calculations on page 3).
2. Grab the bar barbell with both hands and stand with your feet shoulder-width apart.
3. Using proper posture, bring the bar to chest level.
4. Quickly push your hips back, bend your knees slightly and without pausing, explode 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.



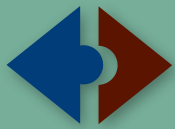
2- to 1-LEG 90° HOP

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.