Plyobalance: Get Nervy About Performance

BY ANTHONY M. ANTONACCI

You work hard to stay fit, but despite all your training you still feel like you're not quite hitting your mark in terms of on-hill performance. This could be due to the fact that while weight training, running, bicycling, and in-line skating all work wonders for strength and cardiovascular conditioning, none of these activities provide a skiing- or snowboarding-specific workout. To specifically enhance your on-hill performance, you might want to explore the world of plyometrics.

Gaining popularity among athletes who need speed, quickness, and explosive strength characterized by short bursts of intense muscular effort, plyometrics involves training for power. Plyometric exercises focus on proprioception, i.e, the sense of knowing where your body is in relation to its surroundings. Using this awareness, you can condition your body to employ efficient movements and balance in response to physical demands imposed by your surroundings. Essentially, the value of plyometrics is that it takes into account the specific movements that make up a certain sport and offers exercises formatted to strengthen the muscles used in that sport. Moreover, it prepares those muscles for quick response in physically demanding situations.

For example, a skier can benefit from a plyometric exercise that uses 8 to 10 Physiodiscs (for a description of a Physiodisc, see "Tools of the Plyobalance Trade," page 37) to enhance balance, promote agility, and stimulate precise control of one leg at a time. The skier places each Physiodisc approximately 3 feet apart at a 45-degree angle to the ground. He or she then balances on the left foot for several seconds on the first disc and then leaps onto the next disc with the right foot, "sticking" the landing and holding that position for several seconds before leaping onto the next disc with the left foot. The skier continues in this manner until all the discs have been used.

Although plyometrics can be of great benefit to athletes, one word of caution is in order. Since some of the more advanced plyometric drills can cause injury to individuals who lack proper conditioning, anyone interested in exploring this type of exercise should first build a solid foundation of fitness and muscle strength.

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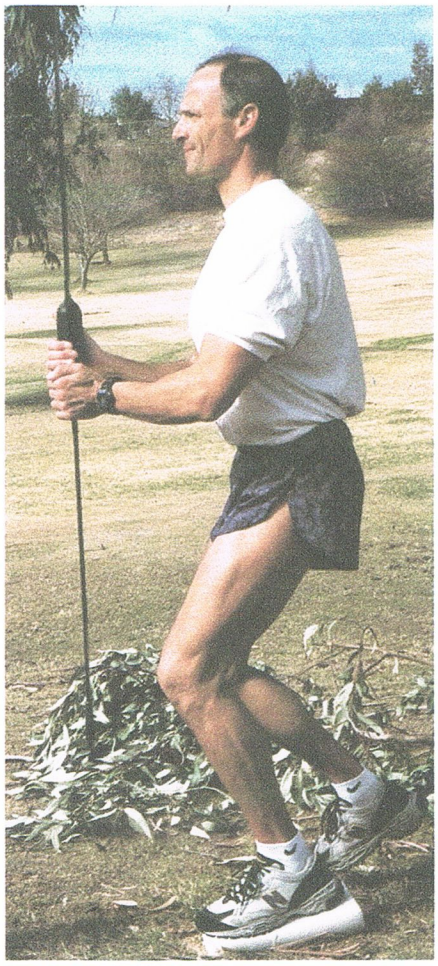

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USING A BODY BLADE WHILE STEPPING ON A FOAM ROLLER CAN HELP TO REFINE BALANCE.

NERVOUS SYNERGY

With regard to proprioceptive demand, the best way to understand the concept of plyometrics is to consider the workings of the nervous system. Movement is produced when nerve endings transmit stimulus from the brain to specific muscle groups. But before you can work on sport-specific movements, you have to "hardwire" fundamental movement skills into your nervous system. This lays the foundation of overall fitness that allows you to then apply a well-conditioned body to a specific sport—in this case, skiing or snowboarding.

Focusing on the nervous system is a departure from the way most people think about training, but it makes sense if you consider that the nervous system

controls the muscles in your body. What good are strong muscles if your nervous system doesn't know what to do with them? If you fail to address this connection, you might call upon you muscles to perform but find that your nervous system doesn't recognize the request. The inefficient or insufficient movements that result will likely leave you frustrated with your performance.

Plyo*balance*—which, as the name suggests, is based on certain plyometric movements that incorporate proprioceptive demand and balance—can be of great benefit to skiers and snowboarders. It's designed to reintroduce movements you probably haven't used in a long time.

Remember when you'd spend most of your day jumping over fences, bounding over logs, hopping over curbs, and skipping down the street? How about all those times you tried to retain your balance when walking forward and backward along a curb? Have you participated in many of these activities lately? I didn't think so, but did it ever occur to you that snowsports require a lot of these same movements? You're still making a lot of these moves on the slopes and trails but probably not giving much thought to practicing them in your spare time.

Why does a nine year old pick up skiing faster than a 40 year old? It could be a factor of age, physical dexterity, or lack of fear. But it's also possible that the nine year old at play is practicing all that "stuff" that just so happens to hardwire the balancing skills and quick bursts of power than can make it easier to learn and improve skiing and snowboarding skills. In contrast, the 40 year old is sitting at a desk all day and running around the block three times a week.

NEW TRAINING TACK, TOOLS

By spending the off-season running, cycling, in-line skating, swimming, paddling, and even weight-training, you certainly helped enhance your strength and conditioning for snowsports, but do any of these activities work to train the nervous system? Only in-line skating would warrant a "yes" answer.

Like all other sports, skiing and snowboarding involve sport-specific neural pathways, so a complete training regimen should emphasize sport-specific muscle movement as well as conditioning. (See "Examples of Plyobalance Routines," page 38.)

By using such tools as a Wobble Board, Body Blade, foam roller, medicine ball, or Physioball you can add a dynamic dimension to your training that puts your nervous system on equal footing with your cardiovascular system. (For descriptions of these tools, see "Tools of the Plyobalance Trade" below.) When you incorporate new tools into your training, you also add fun to your workouts. Using plyometric-related

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Tools of the Plyobalance Trade

BODY BLADE: a long, oscillating blade similar in some ways to a fencer's foil. It reverberates to match the energy the user puts into moving it, and as a tool for resistance training is used to improve joint and muscle mobility and balance.

FOAM ROLLER: a foam cylinder that's been cut in half lengthwise. It is highly mobile when weight is placed on it and is used to promote balance.

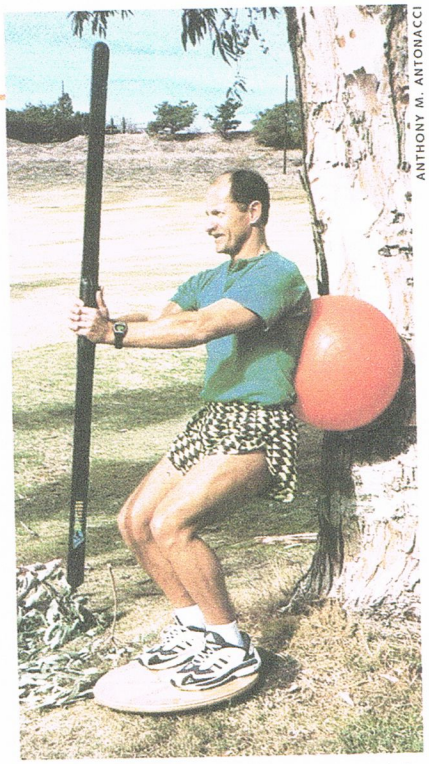
MEDICINE BALL: a heavy, soft vinyl ball typically stuffed with sand or other materials. It can weigh from 4 to 20 pounds and is used to enhance strength during standard exercises.

PHYSIOBALL: an inflated plastic ball that's 1 to 3 feet in diameter. Fitness trainers and physical therapists use this tool to help people improve their sense of balance.

PHYSIODISC: an inflated plastic disc approximately 14 inches in diameter and 3 to 6 inches high. It's used to help heighten proprioceptive awareness or a sense of body placement while moving through various terrain.

WOBBLE BOARD: a 20-inch board that tilts from side to side by means of a fulcrum centered under the board. It's used to help people improve their balance.

—Anthony M. Antonacci



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THE TRIPLE THREAT: THE SUBJECT IN THE PHOTO IS HOLDING A BODY BLADE, LEANING BACK AGAINST A PHYSIOBALL, AND BALANCING ON A WOBBLE BOARD.

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movements in your routine, such as skipping, hopping, bounding, and jumping, will further prepare your body for on-hill demands.

In case you're worried about the amount of time this type of workout requires, it's not as much as you might think. In the off-season two days a week should suffice, and during the season one day a week should be enough to round out your overall training program. In terms of the time you'd need to spend on each session, I recommend performing plyobalance exercises for 45 minutes in order to stimulate the dynamic and explosive power you want for skiing and riding on the mountain.

As for age limitations, there are none. I've used plyobalance exercises with people age 4 to 84. As a doctor of chiropractic and naturopathic medicine, I've used the principles of plyobalance for more than 15 years to help professional athletes enhance their performance, promote the recovery of post-surgery patients, and rehabilitate the injuries of "weekend warriors." I've even used it to help children improve their gross motor movements.

Plyobalance is not a replacement for but an enhancement of your regular workout routines. Regardless of your athletic prowess, you can improve your performance on or off the mountain by adding a variety of routines that will increase the rate of your reaction to physical challenges. By working to engage your nervous system as well as your muscle groups, plyobalance will allow you to engage your body's potential both in terms of internal neural pathways and external displays of movement that result. ◆

In addition to being a chiropractor and naturopathic physician, Anthony M. Antonacci serves as the director and a strength/conditioning coach for the Performance Enhancement Centers in Woodland Hills and Thousand Oaks, California. He is a PSIA-certified Level II alpine instructor at Mountain High Resort in Wrightwood, California. For more information on plyobalance, you can contact Dr. Antonacci via e-mail at dcsynergy@aol.com.

GLOSSARY

BACKWARD LUNGE
A backward step of 3 to 4 feet with one leg while the remaining forward leg drops so that the knee is at a 45- to 90-degree angle.

BACKWARD STEP-UP
A step back and up one foot at a time onto a "step" (either a milk crate or a manufactured plyo-step). Similar to walking backward up one stair.

BODY-WEIGHT SQUAT
A double-leg body squat done with the hands on the hips (or with arms crossed in front of the body). When squatting with both legs, the knees are at a 45- to 90-degree angle.

BULGARIAN SQUAT
A squat on a forward leg with the knee at a 45- to 90-degree angle while the back leg is placed with the knee on a step that is 1 to 2 feet high.

FORWARD LUNGE
A large step forward with the knee of the front leg at a 45- to 90-degree angle and the back leg dropping down until the knee almost (but not quite) touches the ground.

JUMP SQUAT
Same as the body-weight squat only you emerge from the squat with an explosive jump that lifts you 2 inches to 2 feet off the ground (the height of the jump will correspond with your fitness level).

ONE-LEG HOP IN PLACE
Just like it sounds. You hop on one leg with the other leg pulled up to a 45-degree angle at the knee.

SIDEWAYS LEAP AND HOLD
Using a move similar to the one used by speed skaters, you leap 2 to 3 feet to one side on one leg and "hold" that position for a few seconds before leaping to the opposite leg.

SIDESTEP OVER HURDLE
Using a short bench or Plyostep as a hurdle, you leap over and land on both feet, keeping your legs together and performing leaps in a continuous motion.

SIDE-TO-SIDE LEAP
A sideways leap performed by balancing on one leg and gently pushing off the floor or ground and launching into a short leap onto the opposite leg.

SINGLE-LEG JUMP SQUAT
Pulling one leg up with the shin at a right angle to the ground, you squat to a 45- to 90-degree angle, then jump up and land on the same foot.

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SKIP CROSS-CRAWL
A skipping exercise in which you swing the left arm forward when moving the right leg forward, and vice versa. (There's no crawl involved; the term "cross-crawl" is derived from a similar movement—without the skipping—that's used to help develop coordination.)

SKIP ROPE
Just as you'd expect—you grab a piece a rope and start skipping.
—*Anthony M. Antonacci*

Examples of Plyobalance Routines

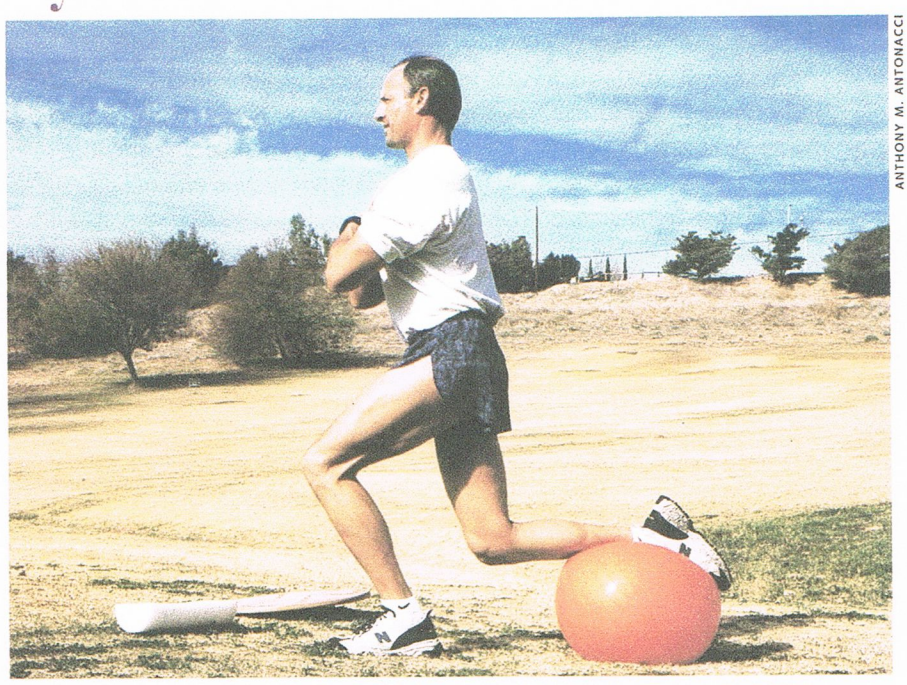
The following are lower-body routines, but when performing these movements it's important to remember that they involve the entire body. Integrated functional movement is the main idea here. For a description of the exercises that follow, see the glossary on page 39.

COURSE ONE	
Body-weight squat	20 repetitions
Jump squats	20 repetitions
Sidestep over hurdle	10 repetitions each side
Backward lunge	10 repetitions each side
Skip, cross, crawl	40 yards
Skip rope	30 seconds

The goal is to perform five sets of each of the exercises in Course One. When starting out, you can take 30 seconds' rest between exercises and one or two minutes between sets. Eventually, you will want to work toward eliminating rest periods between exercises or sets. For variation you can add the use of a medicine ball, holding it overhead or close to the navel.

COURSE TWO	
Single-leg squat	10 repetitions each leg
Sideways leap and hold	10 repetitions each leg
Forward lunge	10 repetitions each leg
Backward step-up	10 repetitions each leg
Forward bounding	40 yards two legs

In addition to the variations suggested for Course One, you can also vary your repetitions in Course Two. For the "Bulgarian squat" (see photo above), you can use a Physioball for support. To work on improving your balance, you can place a foam roller half under your balancing foot to create a semi-stable base for increasing your proprioceptive responses.



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WHEN PERFORMING A BULGARIAN SQUAT, YOU CAN ADD A PHYSIOBALL FOR ADDED BALANCE PRACTICE.

COURSE THREE	
Wobble Board/Physioball/ Body Blade squat	20 repetitions
Single-leg jump squat	10 repetitions each side
Side-to-side leap	10 repetitions each side
Bulgarian squat	10 repetitions each side
Backward running	40 yards
One-leg hop in place	10 repetitions each side

Be creative. Add the use of the body blade while hopping or squatting. For added intensity, incorporate a 100-yard run that alternates from sprinting forward to sidestepping to backward running to leaping with two legs to hopping leaps with one leg.

Set up 10 or 12 short hurdles or milk crates and do two-leg jumps over them. Then try it again, but this time using side-to-side jumps. Then perform these moves while carrying the medicine ball overhead or close to your navel while jumping to create some weight resistance for both your upper and lower body while you move.

In addition to working on the forward or backward motion of your activities, practice halting your movements by stopping abruptly or "sticking" your landings. Start by exploding forward for five steps, then stop and hold for two or three counts. Perform this movement in all directions. You can vary this exercise with a medicine ball to help provide resistance, but "stay low" during the exercise in order to work on your balance while carrying the ball. Staying low with the medicine ball entails keeping your knees bent at a 45- to 90-degree angle with your upper torso flexed forward at 45 degrees.

Make up your own courses and change, change, change. And work at your own pace when starting out so you don't feel beat up afterward. These workouts are designed to excite the nervous system, not make it surrender. If it seems too much, slow down, rest more, and smile. Remember, this is play, not work. —*Anthony M. Antonacci* ◆