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# Performance Training

*Journal*

*Tapping into  
Mental Imagery*

**Golf**

**More Power off the Tee**

*Warming Up*

**Hormones and Strength**



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# NSCA's Performance Training Journal

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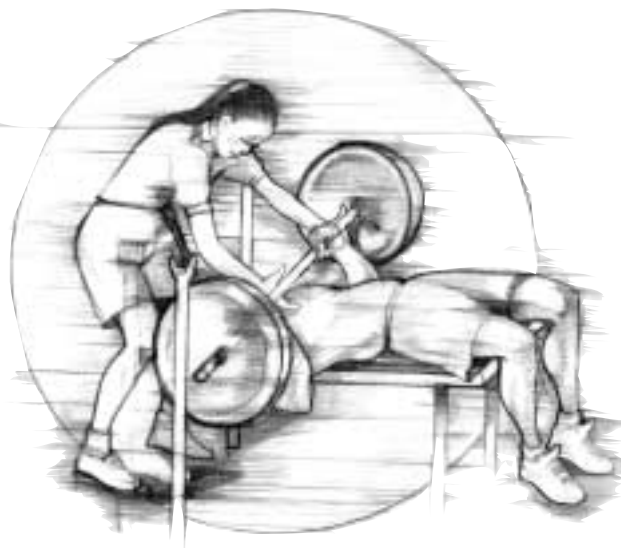
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Share your questions and comments. We want to hear from you. We will choose one question each month for the "Ask the Experts" column. Write to *Performance Training* Editor, NSCA, 1955 North Union Blvd., Colorado Springs, CO 80909 or send email to [webmaster@nscs-lift.org](mailto:webmaster@nscs-lift.org).

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# AskTheExperts

## Question

"I am member of a college baseball team. My role on the team is pitcher. The last time I was a pitcher I was 15 years old. Now that I am 20 years old, my arm hurts more than ever. I find that my arm is not in shape and the conditioning program that my coach is enforcing is not working. My question to you is, 'What conditioning program do you think is best for me?'"

## Answer

It sounds like you started throwing too much, too soon. Your throwing program should have two 4 - 6 week phases. The first phase should start approximately six weeks before the start of your team's pre-season workouts. Your goal during this time should be to get ready for pre-season workouts, not opening day. The purpose of the second phase is to condition your arm for the season opener. In the first phase, slowly get your arms, legs and trunk in shape so that pre-season drills will be easy. Warm-up and stretch before and after each workout to reduce soreness and the risk of injury. Condition your total body, not just your arm. Don't neglect your trunk. When throwing, your body is a 3-link chain: lower body; trunk; and upper body. Forces are initiated in the legs, then transferred to the upper body through the trunk and finally applied to the ball by the hands and fingers. A chain is only as strong as its weakest link. In the body, the weakest link is often the muscles of the abdomen and trunk. A weak mid-section will not let you transfer 100% of the forces generated by the lower body to the upper body for application to the bat or ball. The end result is a loss of arm speed, bat speed and power. The only way to compensate for this loss of speed and power is to place more stress on the arm and shoulder muscles.

Use the following throwing program in phase one to prepare for pre-season workouts. Play catch and do long toss drills for at least 2 weeks before throwing off a mound. Toss for 17 minutes on Monday, Wednesday, Friday and play catch for 10 - 15 minutes on Tuesday, Thursday, Saturday. Start long toss at 50 feet. Throw for 1 minute at 50 feet and then move back to 60 feet for a minute. Move to 70 feet for a minute and then throw for 2 minutes at 80 feet. Back-up to 90, 100 and 120 feet for 2 minutes each. After 2 min at 120 feet, move up to 100 feet for a minute and then shorten the distance by 10 feet each minute, ending at 60 feet. Make quality throws at the end—throw the ball straight without an arc. Make 90 - 100 throws in 17 minutes. Use your total body, especially your hips, legs and trunk to reduce stress on your arm. After you have played catch and long toss for 2 weeks, it's OK to start

throwing off a mound. Throw off a mound 2 - 3 times per week for 5 - 10 minutes per day. Throw only fastballs and change-ups for the first 2 weeks. Play catch and do long toss drills on non-mound days. Substitute the 17-minute long toss workout for mound work, if you don't have access to a mound.

Once pre-season workouts begin, you will systematically increase the frequency and volume of your throwing program to include work on the side, pitching batting practice and intrasquad games. Hopefully, your coach will have a systematic pre-season plan. If not, there are several books—including *The Art of Pitching* by Tom Seaver and *The Pitcher's Bible* by Nolan Ryan—that can provide valuable information.

### 17-Minute Throwing Program

Feet	Minutes	Throws
50	1	5 - 6
60	1	5 - 6
70	1	5 - 6
80	2	10 - 12
90	2	10 - 12
100	2	10 - 12
120	2	10 - 12
100	1	5 - 6
90	1	5 - 6
80	1	5 - 6
70	1	5 - 6
60	2	10 - 12

#### A. Eugene Coleman, Ed. D.

*Gene Coleman has been Professor and Chair of the Program in Fitness and Human Performance at University Houston-Clear Lake since 1976, the Strength and Conditioning Coach for the Houston Astros since 1978. Dr. Coleman is the author of 52-Week Baseball Training, published by Human Kinetics, 2000.*

## Deep Squats, Best Way to Train Buttock Muscles?

While deep squatting tends to get a bad rap for the possibility of causing knee injuries, it may be just what the doctor ordered to target that hard-to-train gluteal group. Researchers from Furman University in Greenville, SC, had 10 well-trained men perform squats at partial, parallel and full depths with 100% - 125% of their bodyweight while special electrodes placed on the skin measured the activity of the contribution of the gluteals, quadriceps and hamstrings. The deeper the athlete squatted, the greater the role the gluteus maximus (largest buttock muscle) played in the contribution of strength during the ascent (concentric) phase. Taking time to perfect your form and controlling the depth of your squatting will not only increase your overall strength but also add strength to your buttock muscles!

*Medicine and Science in Sports and Exercise* 32(5): S56, 2000

## Improve Your Hamstring and Leg Strength ...

Many individuals find the hamstring group a hard group of muscles to train for strength and definition. Fortunately, researchers in Greenwich, CT, recently tested 11 athletes to determine whether the deadlift or leg curl is more effective for strengthening the hamstrings. According to EMG activity (a measure of muscle activation), both the Romanian deadlift (a variation of the stiff-legged deadlift) and the leg curl showed strong activation of the biceps femoris, the largest muscle on the back of the thigh. The Romanian deadlift appeared to be superior, however, since EMG activity increased during the concentric phase (shortening) of that exercise. One explanation may be that more muscle fibers are activated during the Romanian deadlift due to the angle of the torso with respect to the legs. Since the hamstrings are biarticular muscles (spanning two joints), they elicit a greater stretch than other hamstring exercises when you bend forward. The Romanian deadlift also reduces the strain typically felt in the low back during traditional stiff-legged deadlifts and helps to prevent overstretching of tight hamstrings. By adding Romanian deadlifts to your program you will see a marked improvement in hamstring strength.

*Medicine and Science in Sports and Exercise* 32(5): S55, 2000

## Androstenedione and Androstenediol Supplementation Has No Effect on Body Composition or Strength in Resistance-Trained Men ...

D. Falk, M.S., and coworkers from University of Delaware, Newark, DE, determined the effects of eight weeks of supplementation with 224 mg of androstenedione and 120 mg of androstenediol (344-mg total NORANDRO per day) on strength and body composition in resistance-trained males. Subjects were randomly assigned to receive 344 mg of Norandro, or a placebo. Each subject participated in resistance training approximately four days per week for the duration of the study. Body composition was assessed via dual energy absorptiometry (DEXA). Strength was determined with a one-repetition maximal bench press and biceps curl. There were no significant changes in body composition or strength after eight weeks of training. The authors concluded moderate dose supplementation with various forms of androstenedione and androstenediol does not alter strength or body composition in resistance-trained men. This is one of several studies recently published to show that taking andro products in recommended doses does not have a major impact upon strength improvements and body composition.

*Medicine and Science in Sport and Exercise* 33: S340, 2001.

### About the Author

*Edmund R. Burke, Ph.D., CSCS, is Professor and Director of the Exercise Science Program at the University of Colorado at Colorado Springs. He served as Coordinator of Sports Sciences for the U. S. Cycling Team leading up to the Olympic Games in 1996 and was a staff member for the 1980 and 1984 Olympic Cycling Teams. Dr. Burke is a Fellow of the American College of Sports Medicine and a Certified Strength and Conditioning Specialist (CSCS) with the NSCA. He has authored or co-authored fifteen books on training, fitness and nutrition.*

## Tapping into Mental Imagery

“Before every shot, I go to the movies inside my head.”—Jack Nicklaus, pro golfer.

**W**hat the heck is he talking about? To answer the question, try the following activity. Then we'll discuss what it is and how you can purposefully use the skill to enhance your golf performance (the skill is applicable to any athletic pursuit so substitute the appropriate sport terminology).

Take a minute and think back to your best hole of golf in the past several months. With your eyes shut, mentally take in the surroundings as you stand near the tee. See and feel your drive, hear the “ping” as the club connects with the ball. See the trajectory of the ball. Re-experience in your mind the shots you took to get the ball from the tee into the hole. How effortless it felt!

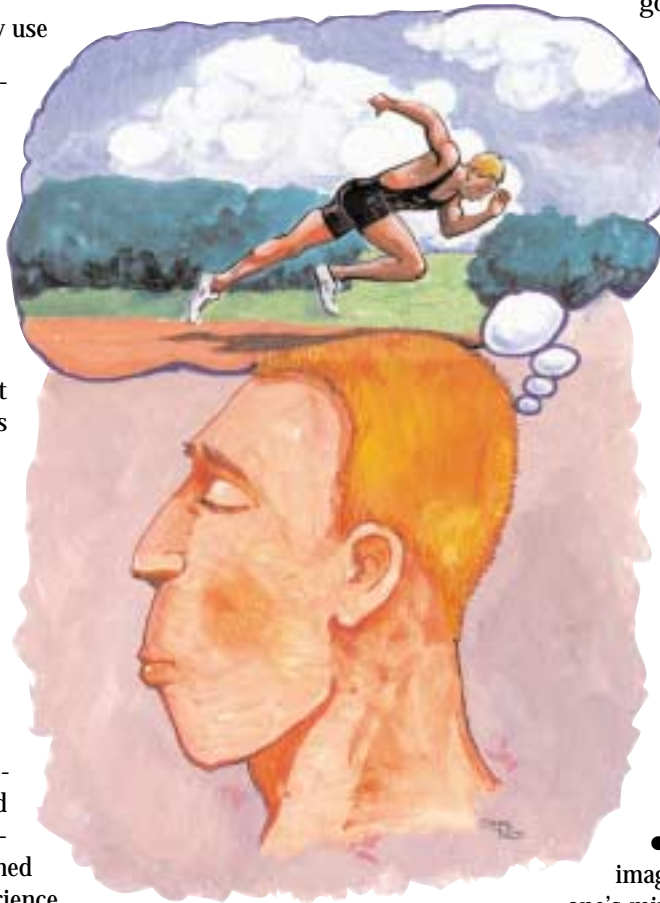
The skill you just used in re-experiencing playing a hole in golf, and the skill Jack Nicklaus was referring to, is imagery. Imagery, defined as creating or recreating an experience in one's mind, is a mental skill that is used by many elite athletes to enhance performance. Imagery is an invaluable mental skill that can serve many purposes related to enhancing performance. For example, imagery can be used to 1) build confidence by seeing success, 2) prepare for competition through mental rehearsal of various situations, 3)

motivate by imaging past and future competitions/competitors, and 4) learn and perfect skills through technique mental rehearsal.

As an athlete who is trying to balance family, career, and other pursuits in addition to athletic goals, imagery can be especially valuable for you. Unlike collegiate or professional athletes who are able to dedicate their days to training, you have a limited amount of time to devote to your sport. But, through the use of imagery, you can supplement your physical training with mental training; view imagery as an additional form of practice. Instead of accepting your skill level as it is because you don't have the time to dedicate to the range, read on to learn how you can use imagery to further improve your physical skills (but don't forget about the other benefits of using imagery).

First, let's discuss a few keys to using imagery.

- Most people think of imagery as limited to seeing in one's mind's eye. But, to truly create or recreate an experience, you need to tap into all the senses. Because sport is kinesthetic it is critical to experience “the feel” when using imagery.
- Use an internal (seeing through your own eyes) and external (experience as if watching on video) perspective—



both perspectives are beneficial depending on the situation.

- Athletes often find it helpful to incorporate some movement when using imagery—not necessarily a full swing but slight movement in the muscles involved in the swing.
- If you have not used imagery, begin by practicing on non-sport, immobile objects such as a lemon—see, feel, smell a lemon in your mind. Progress to more complex scenes such as relaxing on a beach. Finally, practice imaging sport skills.

## How can you use imagery?

1. Take 10 - 15 minutes during your day to mentally practice. Focus on correct technique—see a correct swing, note what it feels like, attend to a specific aspect of the stroke that you have been working on.
2. Incorporate imagery into your pre-shot routine. Begin by imaging, seeing and feeling, the upcoming swing/stroke. Next, take a practice swing to physically rehearse what you just imagined. Finally, address the ball and replicate what you have just practiced mentally and physically.

### About the Author

*Suzie Tuffey received her Master's and Ph.D. in Sport Psychology/ Exercise Science from the University of North Carolina-Greensboro. She has worked for USA Swimming as the Sport Psychology and Sport Science Director, and now is Associate Director of Coaching with the USOC where she works with various sport national governing bodies (NGBs) to develop and enhance coaching education and training. Additionally, Suzie is an NSCA-certified personal trainer.*

# Warming Up Your Golf Stroke

Patrick S. Hagerman, Ed.D., CSCS\*D, NSCA-CPT\*D

**T**he scenario: a typical day at the first hole of the local golf course. My buddy picks a club, steps up to the ball, does a couple of practice swings, lines up and proceeds to slice the ball completely into the trees. Not a good start. I ask if that was the best he could do, to which he replies, “It just takes me a couple of holes to get warmed up.”

I recently attended the US Open where I had the opportunity to see some of the best golfers in the country play. I quickly realized that the scene I just described would never happen to a professional golfer. The pros cannot afford to take a couple of holes to warm-up. They have to be warmed up and ready to go before they step up to the first tee, or the tournament could be over before it starts.

In every golfer’s search for a way to improve their game, we often forget that what we do before we play can make a huge impact on how we play. We must prepare the body for the actions we are going to require it to perform. Golf is a game of precision, timing and agility. These are characteristics that cannot just be turned on exactly when they are needed; they must be trained and warmed up before action. I have witnessed a variety of warm-ups performed by professional golfers, and there really isn’t one correct way of going about it. One thing they all had in common was that the warm-up provided increasingly complex movements done slowly at first, and later with more speed; and they all involved movements that are required during a swing. The following warm-up exercises are just a few of many that can be incorporated before your game, and will definitely help you stay out of the rough.

## One-Arm Swing

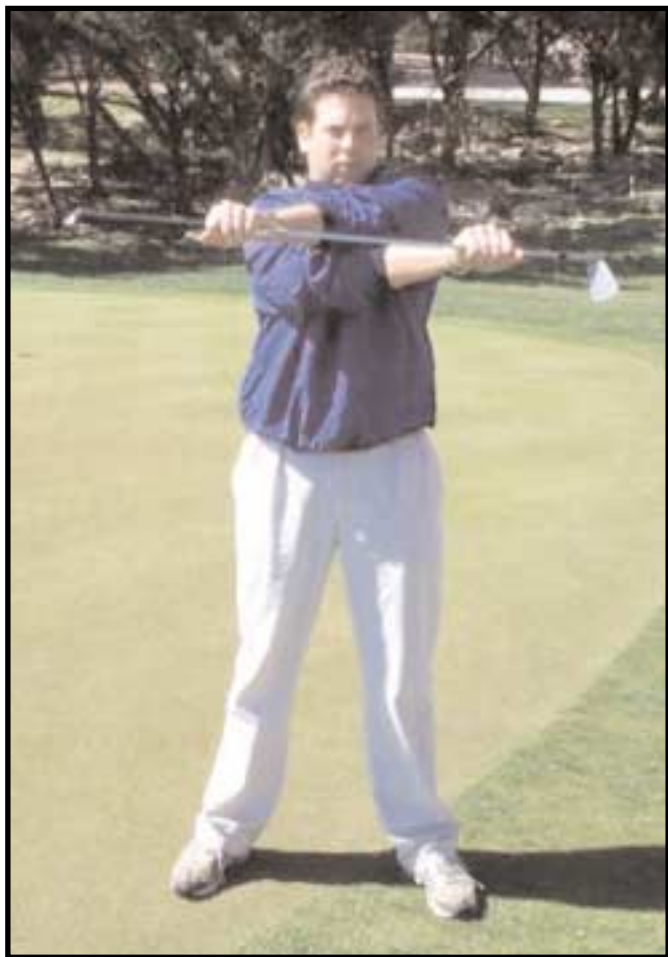
Stand with your feet together, holding the shaft of the club just below the grip. Slowly swing the club back and forth in front of you like a pendulum (Figure 1). Each swing should get progressively higher until the club reaches the highest point, but doesn’t go over the top. Now slowly swing the club in a complete circle, taking about 10 - 15 turns forward and then 10 - 15 turns backwards. Do this drill with each arm to prepare the shoulders for both the range of motion and the speed required of the swing.



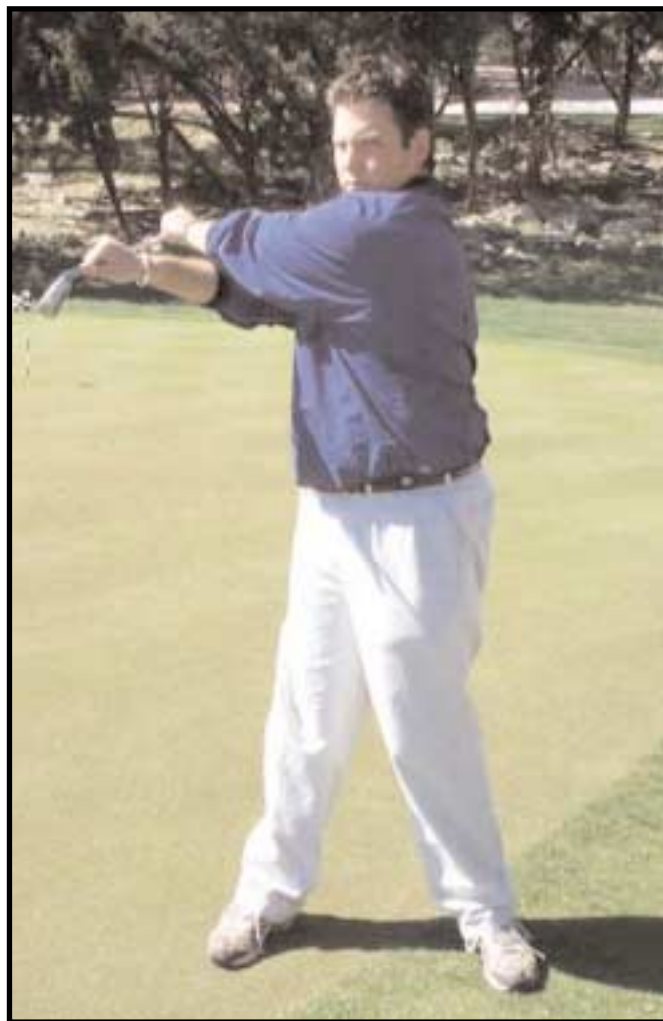
**Figure 1: One-Arm Swing**

## Torso Twist with Shoulder Stretch

Stand with your feet apart just as you would before a swing. Grasp a club as shown in Figure 2a, with your arms crossed one over the other, reaching out toward the ends of the club. Slowly twist your body around to one side, attempting to look behind you (Figure 2b). Move from one side to the other, increasing the stretch at the end of each twist. Do not bounce at the end of the stretch, but hold the stretch, pushing your body further around each time. Complete about 10 - 15 stretches on each side. This drill will prepare your abdominal, upper and lower back muscles for the quick twisting and contracting movements of the swing.



**Figure 2a: Torso Twist with Shoulder Stretch - start**



**Figure 2b: Torso Twist with Shoulder Stretch - finish**

## Practice Swings

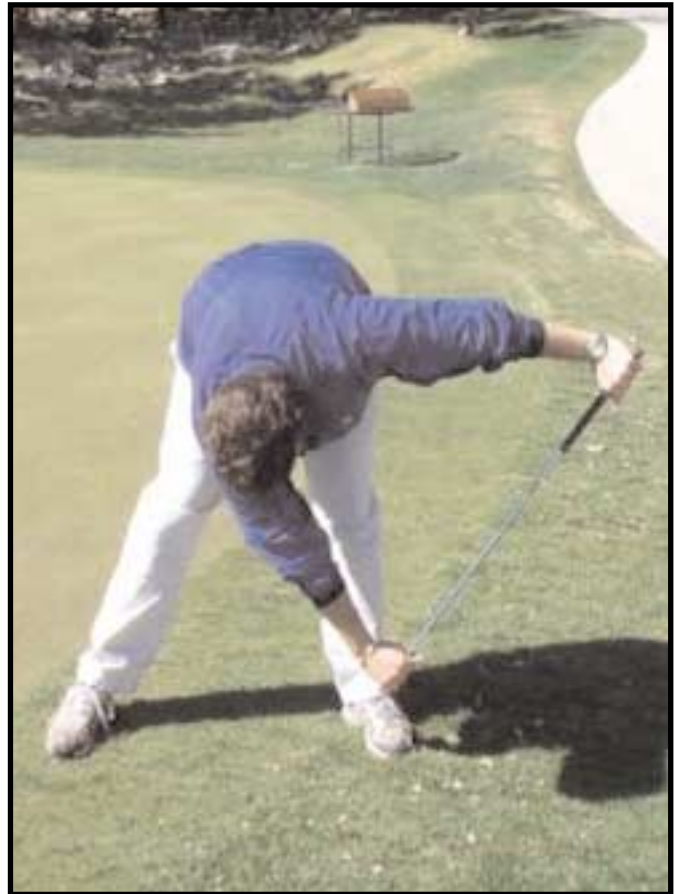
Full practice swings on the driving range are the best way to determine how ready your body is for actual play. You won't see a professional golfer tee off before spending some time on the driving range, while most of us either hit on the driving range or play a round, but rarely both. If you want to improve your game, improve your body's ability to hit the ball by practicing before playing. Warm-up swings immediately before a shot are fine for lining up the ball, but actual contact with the ball is the best way to prepare for an actual swing. You never see a baseball pitcher come out and start throwing in a game before warming up in the bullpen, or a basketball player neglecting his shooting drills before a game, so warm-up your swing like the pros do at the driving range.

## Windmills

Hold your club at both ends, feet spread wide apart (Figure 3a). Keep your arms straight, and while bending mainly at the waist and slightly at the knees, reach your left hand down towards your right foot. Stand back up straight and reach your right hand down towards your left foot (Figure 3b). Repeat this drill 1 - 15 times on each side to again loosen up the trunk, shoulders, hips, and legs.



**Figure 3a: Windmills - start**



**Figure 3b: Windmills - finish**

There are many other drills that can be used for warming up. You can break down your swing into small portions and design a warm-up that helps you loosen up the tightest part of your motion. The goal of warming up is to increase the blood flow to the muscles you will be using, thereby preparing them for use. Follow these examples or design some of your own and you can get your game under control before that first tee.

### Acknowledgement

Thanks to Aaron Green and the La Cantera Golf Club (San Antonio, Texas) for their help with the photographs.

### About the Author

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## Hormones and Strength

**H**ormones can be thought of as the body's messengers. They are secreted from endocrine glands into the blood and travel throughout the body to cause other cells to perform specific functions<sup>4</sup>. These functions are carried out only on the specific target cells which possess the receptors for that hormone. In this way only the desired outcome is initiated at the target cell.

There are two main classifications of hormones—steroidal and non-steroidal—with each performing separate functions at different levels of a target cell. The so-called “sex hormones”—estrogen and testosterone—are responsible for

### Age, Gender and Strength

Males and females are very similar physically up to the age of puberty (12 - 14 years). After this time the sex hormones begin to cause gender differences that eventually lead to a male strength bias. Specifically, testosterone causes an increase in bone formation and muscle mass, which leads to increased size in males when compared to females, who may possess only approximately 70% of the muscle mass of their male counterparts<sup>4</sup>. This mass difference is most pronounced in the upper body, where females deposit increased amounts of fat and their strength is thereby only approximately 50 - 65% that of males<sup>4</sup>. In the lower body, strength differences between genders are much less evident when accounting for fat deposits. That is, strength per unit of muscle mass is similar between genders but still not identical<sup>2</sup>. Resistance exercise has been shown to increase the amount of testosterone in the blood and it remains elevated there for more than an hour in trained athletes. However, resistance training does not cause the same testosterone elevations in women<sup>1</sup>.

“ For women to bulk up to the level exhibited in some popular magazines requires the use of artificial anabolic steroids ... ”

many changes in the human body and are the primary cause for differences between boys and girls and men and women. Incidentally, they are called the “sex hormones” not because they are exclusive to the gender, but because of their relative concentrations in each gender. For example, males possess testosterone in amounts 10 - 20 times greater than females<sup>3</sup>. It is here that we should begin our hormonal journey.

Estrogen, on the other hand, is responsible for female sex characteristics, and may play a role in the changing strength expression of women. Bodyweight has been reported to fluctuate as much as two pounds during the menstrual cycle, and this may affect strength in women<sup>2</sup>. However, the absolute strength of females during the specific phases of the menstrual cycle does not seem to change with different estrogen concentrations.

## Conclusion

In the final analysis, strength differences between men and women can be primarily summed up by the difference in physical size. However, this size disparity is a function of greater concentrations of testosterone in men. Therefore, any fear that women may have regarding bulking up through resistance training is basically unfounded since they possess testosterone hormonal levels 10 - 20 times less than men. Essentially, for women to bulk up to the level exhibited in some popular magazines requires the use of artificial anabolic steroids such as testosterone injections. Women do adapt to resistance training in similar patterns as men just not to the same magnitude.

The effect of training on the human muscular system will be the focus of next issue's column.

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# More Power off the Tee

Irv Rubenstein, Ph.D., CSCS

**E**very one of my clients, no matter how good or bad they are, try to tell me how relaxing it is to play a round of golf with friends and competitors, then the complaints begin of the aches, the so-closes, and of the low back pain that sometimes follows.

According to Nancy Quarcelino, Class A member of the PGA and LPGA, and director of her own school of golf at the Legends Club of Tennessee in Franklin, TN, the speed of a golf swing depends on the width of the arc (arm extension), the length of the arc (the backswing), the lever (wrist angle) and balance (the set-up.) The last issue is a technical one beyond the scope of this article. The others, however, are physical training issues that can be accented with resistance training. Considering that professional male golfers swing the club at speeds up to 160 mph and females up to 120 mph, and recreational clubbers manage to generate speeds about half as fast, its no wonder a non-contact sport such as golf produces as many injuries as it does.

Strength is the ability to produce force, whereas power is the ability to produce force rapidly. The power of the golf swing comes from the uncoiling of the joints from foot to wrist, and utilizes nearly every joint in the body. By properly timing the uncoiling of the joints, you will generate more power. In golf, technique is more important than strength for producing

power; but with more strength, you can optimize your technical ability to produce the amount of power you need.

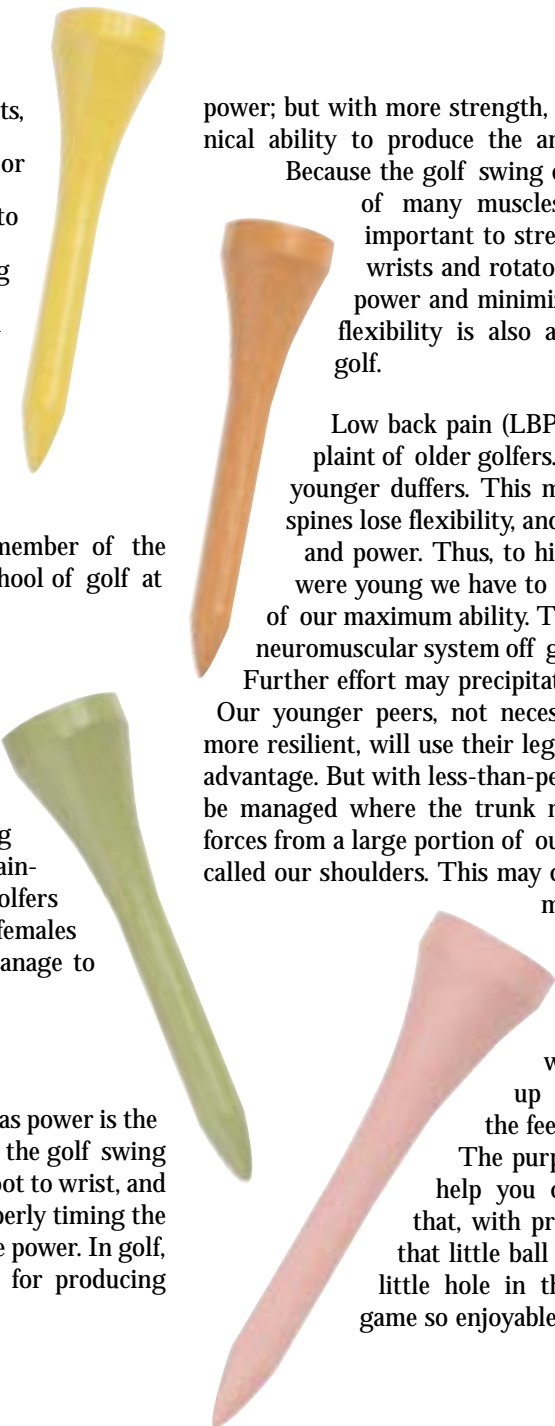
Because the golf swing depends on the coordination of many muscles across many joints, it is important to strengthen the legs, hips, torso, wrists and rotator cuffs in order to maximize power and minimize the risk of injury. Trunk flexibility is also an important component in golf.

Low back pain (LBP) is the most common complaint of older golfers. Shoulder complaints plague younger duffers. This makes sense. As we age, our spines lose flexibility, and in general we lose strength and power. Thus, to hit the ball as far as when we were young we have to exert at a higher percentage of our maximum ability. This eventually may catch our neuromuscular system off guard and lead to back strain. Further effort may precipitate an injury worthy of pain.

Our younger peers, not necessarily in better shape, just more resilient, will use their leg and trunk power to greater advantage. But with less-than-perfect skills, this surge has to be managed where the trunk meets the arm, transferring forces from a large portion of our mass through the “funnel” called our shoulders. This may create the beginnings of the most typical shoulder problem, rotator cuff strain or impingement.

The following exercises will help you bring the power up from the ground, through the feet, and transfer it to the club.

The purpose of these exercises is to help you create the rotational forces that, with proper club control, will send that little ball flying further, closer to that little hole in the ground that makes this game so enjoyable to you.



## Leg Power

Where the rubber meets the road, that's where the power begins. Rather than work the feet and ankles separately, the following lower body exercises will help you coordinate the lower extremities in such a way as to create a power lateral and rotational surge that initiates the golf swing.

### The Squat

With your feet golf stance apart and your head, neck and spine in neutral, or straight, alignment, push the hips back immediately before you allow the knees to bend. Hold the weight between the legs, and take it down directly toward the floor, between the feet. Only go down as far as you can with the knees staying behind the toes and the spine remaining neutral. (Figure 1)



**Figure 1: Squat**

## Waist Power

Basic trunk rotation strength needs to be developed before proceeding to the more explosive training exercises.

### Upward Rotation

Attach a tube to a low support (loop it around a dresser leg, the lowest fence sections, or with a door strap, below the low hinge of a door). With both hands holding the handle, sweep the tube upward and away but not back toward you. Initially perform these slowly; as your technique improves, add speed to the pull portion. (Figures 2a - 2b)



**Figure 2a: Upward Rotation - start**



**Figure 2b: Upward Rotation - finish**

### Downward Rotation

Attach a tube to a high support. With both hands grasping the tube just above shoulder height, sweep the tubing toward your opposite knee. Allow your trunk to rotate and flex to the side you move toward.

## Rotator Cuff Power

While the muscles of the rotator cuff are not visible or big, they must control some very fast and powerful forces. Thus they need to be capable of moving at speeds greater than what is customary in shoulder rehab.

### The Canoe

Stand in golf stance holding a hand towel at each end with the palms facing each other. Sweep one arm to the side and back, keeping it flexed about 90 degrees. Resist with the other arm such that no slack is in the towel. Pull it back down past the other hip so that the lifting arm comes across the waist. Perform one set to one side and repeat to the other side. (Tip: keep the hips square to the feet. By not allowing the hips to rotate, the trunk muscles must stabilize the pelvis and spine, conditioning them as well.) (Figures 3a - 3b)



**Figure 3a: Canoe - start**



**Figure 3b: Canoe - finish**

# Trunk Flexibility

## Rotation

In golf stance, with your back a couple of feet from a wall with a long dowel or broom handle supported on the shoulders, rotate slowly to one side. Spot the end of the dowel to the wall; hold 5 seconds; return to neutral position. Perform a set to one side, then to the other. (Figures 4a - 4b)

## Tilt Rotation

In golf stance, tilted forward in neutral spine, standing a couple of feet from a wall with a long dowel or broom handle supported on the shoulders, rotate slowly to one side. Spot the end of the dowel to the ceiling; hold 5 seconds; return to neutral position. Be sure to keep the spine neutral. Perform a set to one side, then to the other.



**Figure 4a: Rotation and Tilt Rotation - start**



**Figure 4b: Rotation - finish**

# Wrist Power

## Radial Power

Hold the end of the broom handle (or even a driver), with your palm facing down, in front of you. Initially raise the broom slowly. As you get stronger, raise it faster but never so fast as to risk losing control of the handle. (Figures 5a - 5b)



**Figure 5a: Radial Power - start**



**Figure 5b: Radial Power - finish**

## Ulnar Power

Hold the end of the broom handle (or even a driver), with your palm facing down, in back of you. Initially raise the broom slowly. As you get stronger, raise it faster but never so fast as to risk losing control of the handle. (Figures 6a - 6b)



**Figure 6a: Ulnar Power - start**



**Figure 6b: Ulnar Power - finish**

## Sample Program

The following table is a representation of an eight-week program that will prepare you for the opening day of your club's course. For those who live in pleasant climates, this can elevate your game even as you play.

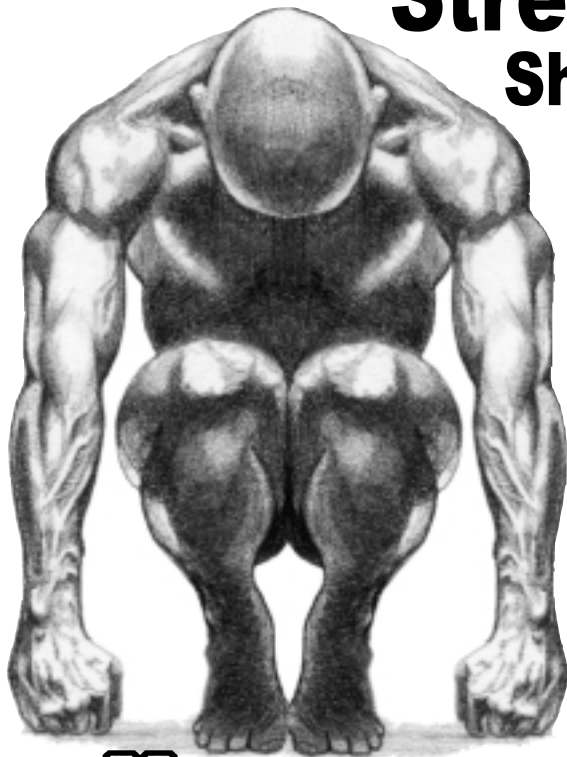
Weeks 1 - 2	Weeks 3 - 4	Weeks 5 - 6	Weeks 7 - 8
Squat (dumbbell) 2 sets x 15 reps x 10 lbs	Squat (dumbbell) 3 sets x 15 reps x 10 lbs	Squat (dumbbell) 2 sets x 15 reps x 15 lbs	Squat (dumbbell) 2 sets x 15 reps x 20 lbs
Upward Rotation 2 sets x 10 reps, slow	Upward Rotation 2 sets x 12 reps, slow	Upward Rotation 2 sets x 15 reps, slow	Upward Rotation 2 sets x 15 reps, fast
Downward Rotation 2 sets x 10 reps, slow	Downward Rotation 2 sets x 12 reps, slow	Downward Rotation 2 sets x 15 reps, slow	Downward Rotation 2 sets x 15 reps, fast
Canoe 2 sets x 20 reps, slow	Canoe 2 sets x 30 reps, slow	Canoe 2 sets x 20 reps, fast	Canoe 2 sets x 30 reps, fast
Radial Power 2 sets x 10 reps, slow	Radial Power 2 sets x 12 reps, slow	Radial Power 2 sets x 15 reps, slow	Radial Power 2 sets x 10 reps, fast
Ulnar Power 2 sets x 10 reps, slow	Ulnar Power 2 sets x 12 reps, slow	Ulnar Power 2 sets x 15 reps, slow	Ulnar Power 2 sets x 10 reps, fast
Trunk Flexibility (Rotation and Tilt Rotation) 2 sets x 5 reps	Waist Flexibility (Rotation and Tilt Rotation) 2 sets x 8 reps	Waist Flexibility (Rotation and Tilt Rotation) 2 sets x 10 reps	Waist Flexibility (Rotation and Tilt Rotation) 2 sets x 10 reps

### About the Author

*Dr. Irv Rubenstein, exercise physiologist, is president and co-founder of S.T.E.P.S., Inc., Nashville's first personal training center. He is a certified personal trainer (ACSM-H/FI, CSCS, ACE, AAHFP-Post-Rehab Specialist), and national presenter of CEC seminars for Exercise Etc., Inc. of Ft. Lauderdale, FL. In addition to having created an instructional video on tubing for personal trainers, Dr. Irv (as he is called on the speaking circuit) has co-produced an exercise video using medicine and stability balls called "Rock, Roll 'n Reggae"™. Dr. Irv can be reached via his website at [www.dr-irvs-fitness.com](http://www.dr-irvs-fitness.com).*

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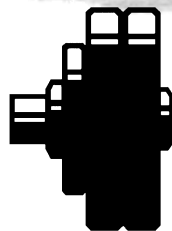
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