

Starting Strength

Strength Training for Golf

by

Nick D'Agostino, SSC

If a sport's performance has a strength component, then training for that sport will evolve over time, driven by competition within the sport, to include strength training. This is true regardless of how deeply embedded within the mythology of the sport is the belief that muscles and strength are bad things. Eventually a rogue individual will come along who, unafraid to challenge the status quo, creates a paradigm shift in training for that sport because of his stronger and more powerful performance. For golf this pioneer was Tiger Woods.

Being one of the first golfers to train like a professional athlete instead of a hobbyist set him up for success that may never again be replicated. In the wake of the path Tiger paved is the realization that strength and power are important to golf performance, and if a player wants to become a better golfer he needs to develop these characteristics off the course.

A Complex Skill Set

Golf is a game of precision, accuracy, consistency, patience and self-control. These qualities of both skill and character are developed over a lifetime of playing golf. Nuances like “touch” and “feel” around the green are built through spending hundreds, if not thousands, of hours honing performance through deliberate practice. This requires using the immediate tactile, visual, and audio feedback from an errant shot to make micro-adjustments in the golf swing. The most important way for a golfer to improve his game will always be practice, but the benefits of barbell training can add game-changing power to a golfer's performance while significantly reducing the risk of injury.

Golf performance can be broken down into a multitude of interdependent abilities. The most important determinants of golf performance are accuracy, a skill which must be *practiced*, and driving distance, a function of strength which must be *trained*. Practice and training are two different activities, and understanding the difference is critical to the effective preparation for any sport.

The drive off the tee is the shot that covers the largest distance. The driver is the club that can hit the furthest. The strategic decisions a player makes on the course are constrained by how far he can hit the ball. Anyone who increases his strength and power so as to increase his drive from 240 yards to 300 yards can drastically change the way he approaches the game due to the loosening of the distance constraint. The bottom line is scoring par is easier when you can hit the ball farther.

So, what are the factors that enable a drive to be hit 300 yards? The short list includes skill, swing kinematics, shaft and club head characteristics, and *the amount of force produced by the player*. All

Strength Training for Golf

of these characteristics can be altered, with some being easier than others. The easiest, most common, and least effective strategy is buying a new club. A player's golf equipment must be adequate and appropriate but need not be top of the line. There are few things golfers are more enthusiastic about than their clubs.

The process of changing your shaft and club head characteristics is fun and effortless. The pain of spending \$400 on a new driver is immediately offset by the promise of longer and straighter drives. The idea of using improved technology to enhance performance is deeply rooted in golf and American culture. The reality is this strategy is rarely useful. It is not the tools but the skill of the craftsman that determines the result, though this can be hard to accept.

The golfer's focus needs to be on his swing, not the technical details of the club. The purpose of the golf swing is to strategically advance the ball on the course. The effectiveness of your swing is improved through feedback. Feedback can be purchased for \$100/hour from your local golf instructor or at the driving range for seven dollars a bucket. As many have found, just like with strength coaches, not all golf coaches are created equal. While becoming a PGA teaching pro is an arduous process that develops a high level of competency, not every Tom, Dick and Harry charging you at your local range has endured this process.

That said, a novice golfer can learn the basics from even a mediocre golf coach. Skills like how to properly grip the club, the setup to the ball, how to deal with common hazards on the course like sand traps, and the structure of your golf swing are the foundations of the game. Learning them under guidance will expedite the process. After you have the basics down, your best teacher becomes the ball. The purpose of practice is to develop consistency in matching your predicted outcome with your actual outcome. This is best accomplished for seven dollars a bucket.

Mastering golf requires mastering a large set of skills. While some of these can be learned on the range the majority are learned on the course. Being able to effectively respond to a wide range of course and internal conditions requires mastering all of them. The meta-skill of choosing how to respond can only be gained through building experience playing golf with people of varying abilities on a variety of courses. In golf, your skill is measured by your *handicap*. The lower your handicap the better golfer you are.

The Need for Power

Power is an expression of strength, and a golf swing that produces a 300-yard drive is an expression of power. In its simplest form, the force transferred to the golf ball is the product of the mass and acceleration of the club head. Bigger and stronger people are more capable of accelerating the golf club and achieving the high club head speeds necessary for 300-yard drives. Longer drives mean shorter approaches to the green. Shorter approaches mean more scoring opportunities. Taking your drive from 240 yards to 300 yards is a game changer. Stronger people do not only hit their drives farther, they also hit their irons farther too. What would normally be the distance you would hit a 5 iron now becomes the distance of everyone's favorite club: the 7 iron.

Strength is best gained using barbell squats, presses, deadlifts, and bench presses. Power, to the extent it can be developed through training, is best gained through the power variations of cleans and snatches. These exercises allow for large amounts of muscle mass to be trained through large ranges of motion with heavy weights. Barbells allow the body to be stressed as a system, and thus adapt as a system. Barbells can be incrementally loaded better than any other tool used to elicit a strength adaptation. These movements force the entire kinetic chain to adapt to an ever-increasing stress. The

Strength Training for Golf

long-term strength adaptation is the building of lean body mass. It is these exercises that best build the structure necessary to hit 300-yard drives. The absence of these exercises as the core of an exercise program is a red flag.

Strength and golf performance is a subject that has not gone completely unnoticed by the exercise science community. There have been many correlations established between muscle strength and golf swing performance variables. Golf swing performance variables typically observed include club head speed, ball speed, carry distance (how far the ball travels in the air), and total distance. In fact, almost every longitudinal study examining changes in golf performance following strength training has shown a positive result in at least one of the above listed variables.

How can any and every resistance training program be producing a positive effect on golf performance variables? The simplest and most compelling explanation is examined thoroughly in the article "[The Novice Effect](#)" by Mark Rippetoe. The answer is that when you are completely un-adapted to strength training, almost any basic form of exercise can produce a strength adaptation, and this strength improves the player's game because golf is ultimately dependent on force production.

The Exercises Make a Difference

While hard to find, there have been exercise programs scientifically observed to have not been able to positively impact any of the tested golf performance variables. A shining example of a program insufficiently stressful to produce a strength adaptation comes from Reyes in 2002 titled *Maximal Static Contraction Strengthening Exercises and Driving Distances*. Reyes looked at 19 low and high handicap golfers and put them through a 7-week training program that consisted of 12 isometric exercises. The heaviest load that could be held for 10-20 seconds was used for each exercise. He found that while his participant's isometric strength improved it did not increase driving distance.

These results can be easily explained. The strength adaptation is specific to the range of motion (ROM) stressed in training, and there is no movement during isometric exercises. Therefore, gains produced by isometric exercise have a very small capacity to influence dynamic movements. This is the reason why a guy with a 500-pound half squat will be seriously challenged with just 275 pounds to proper depth. Never training that ROM results in no increased capacity to produce force in that ROM. The golf swing is a full body movement that utilizes a very large ROM to produce as much club head speed as possible.

A review of muscle strength and its relationship to golf performance published in 2011 came to three primary conclusions:

"1) a positive relationship exists between handicap and swing performance variables, 2) there is a positive correlation between skill (score and/or handicap) and muscle strength, and 3) there is a relationship between driving distance, swing speed, ball speed and muscle strength."

To better explain the above, first, people who shoot lower scores also have faster club head speeds, longer total driving distances and faster ball speeds. Second, people who have more leg, hip, and trunk power, and especially grip strength, are also the people who shoot lower scores. Lastly, the people that hit the ball far and swing fast are stronger.

In the golf drive, it has been established that a wide range of musculature, spanning the entire body, significantly contributes to the production of force. This musculature includes the hip and knee extensors, hip abductors and adductors, spinal extensors and abdominals, and the shoulder internal rotators. The best way to train such musculature is with squats, deadlifts, presses and bench presses.

Strength Training for Golf

The recent article titled *Strength and Conditioning Considerations for Golf* states “it’s reasonable to suggest that based on the available literature, appropriate training programs should include whole body dynamic movements to develop strength and power.” While the science and these experts are beginning to see this truth, real players on the course have not. Unfortunately, when players, and even coaches, do discover the value of strength training, the whole-body dynamic movement they turn to is usually some type of medicine ball toss.

Golf Injuries

Golfers need strength training for more than just to increase the long drive. This might sound crazy for those who do not play regularly, but some golfers actually get injured playing golf (I was one of them). Medial epicondylitis is not referred to as “golfers elbow” by accident. During a golf swing, significant forces of up to 8 times body weight can be experienced. Amateur golfers are most likely to experience injury to the elbow, followed by the back and the shoulder. Specifically, lower back injuries have been reported to account for 23.7-34.5% of all injuries sustained by amateur and professional golfers. The golf swing deals with high magnitude forces and large ranges of motion with sprinkles of axial twisting (trunk rotation), which itself has been determined to be an injury risk factor.

The same factor that injures many athletes in other sports – overuse due to a high volume of practice and competition – seems to be the primary driver of injuries in golfers. It is the increased tissue integrity that is built during strength training that allows all athletes to properly accommodate to the higher practice volumes of their respective sports. Every tissue has its own injury threshold. When the force imposed on a tissue, either in one moment or cumulatively over time, exceeds its ability to adapt, the tissue will experience a mechanical failure. Strength training raises the injury threshold of the entire individual. Gaining strength allows the golfer to better attenuate the forces produced during the swing, thus helping to reduce that player’s injury rate over time.

Overcoming the Resistance

Now that legitimate reasons have been established as to why gaining strength is something all golfers should consider, the question becomes what is causing the lingering resistance to the idea? The answer is something all too familiar, and it has kept thousands of people from lifting heavy weights. It has plagued both women and men in every context it sneaks its way into. It takes many individual forms, but its core is always the same: the fear of gaining too much muscle mass.

The “muscle-binding” hypothesis states that as you gain muscle mass the ROM utilized in your swing will decrease. Your muscles will become tight and bound and you will no longer be able to use them correctly in your swing. This fear is groundless. Golfers, just like all athletes, exhibit adaptive changes in response to the specific demands of their sport. In exercise science, this is termed the principle of *specificity*. The continued practice of golf while simultaneously training strength will force the adaptations specific to golfing to persist despite a gain of muscle mass.

It is also easy to forget that flexibility is not a means to its own end in golf, but a vehicle used to allow for a longer backswing. The logic follows, a longer backswing will allow the golfer more time to generate force and accumulate velocity on the down swing and thus hit the ball farther. Thus, the ostensible purpose of the large ROM used in a golf swing is to allow the golfer ample time to accelerate the club head.

Strength Training for Golf

When looked at empirically, however, this theory does not play out. Keogh et al found *no flexibility measures* that were significantly correlated with club head speed. This was also followed up by Doan et al who found no significant correlation between rotational trunk flexibility and club head speed. All of this leads to the conclusion that muscle mass does not generate the force necessary for high club head speeds by elongating – it does so by contracting.

The principle of specificity may be the most misunderstood exercise principle in the world. It has the ability to rationalize virtually any exercise as useful as long as it appears to mimic some general movement pattern experienced in the sport the exerciser is trying to prepare for. The misinformed coach or trainee embarks on a quest to find and program exercises that visually mimic something he wants to become better at coaching or doing. Before starting this quest, it would be prudent to ask why you are strength training in the first place.

The purpose of strength *training* is to drive accumulating physiologic adaptations in the tissues of the body that are specific *to the physiologic requirements of the sport*. These adaptations occur in the structural components of the body under stress in the sport – muscle, bone, connective tissue. The purpose of golf swing *practice* is to drive *neurological adaptations related to that specific movement*. These adaptations primarily occur in the nervous system.

The best coaches understand that these are two fundamentally different things, each of which must be developed both simultaneously and independently of each other in order to achieve optimal results. In other words, time must be blocked out for each endeavor separately. *Trying to blend golf and strength training into one activity compromises the effectiveness of both.*

In golf the misunderstanding of the principle of specificity takes the form of the use of a variety of medicine ball tosses and weighted club swings. These are likely the first two exercises that come to mind to the majority of the coaches involved with training golfers. The problem with these exercises is that they usually take priority over the exercises that actually have the capacity to drive a strength adaptation. Things like medicine ball tosses, anti-rotation exercises, and swinging a weighted club become the mainstays of many programs, while squats, presses, and deadlifts are rarely on the menu.

The best solution may be to let these exercises remain in the program if the golfer thinks they are going to improve his game. Letting a golfer swing a weighted club or toss a medicine ball may increase his confidence in strength training. As the trainee transitions into intermediate-level programming these can be used as supplemental exercises or included on a general physical preparedness (GPP) day.

Golf, while less physically demanding, is still comparable to other sports. Golfers are subject to the same pitfalls that distract all athletes from getting stronger, including buying new equipment, inefficient and inappropriate practice habits, the “muscle-binding” hypothesis, and misunderstanding the principle of specificity. The golf swing is designed to maximize power. The best way to increase someone’s ability to produce power is to get them stronger. Getting stronger is best accomplished through the use of barbell squats, presses, deadlifts and power cleans. And best way to improve golf skills is to practice them on the course.

[Starting Strength](#) : [Articles](#) : [Videos](#) : [Podcasts](#) : [Training](#) : [Forums](#)

References

1. Goshager, Georg, et al. “Injuries and overuse syndromes in golf.” The American journal of sports medicine 31.3 (2003): 438-443.

Strength Training for Golf

2. McCarroll, John R., Arthur C. Rettig, and K. Donald Shelbourne. "Injuries in the amateur golfer." *The Physician and Sportsmedicine* 18.3 (1990): 122-126.
3. Read, Paul J., and Rhodri S. Lloyd. "Strength and Conditioning Considerations for Golf." *Strength and Conditioning Journal*, vol. 36, no. 5, 2014, pp. 24–33.
4. Reyes, M. G., et al. "Maximal static contraction strengthening exercises and driving distance." *Science and golf IV: Proceedings of the 2002 World Scientific Congress of Golf*. 2002.
5. Suchomel, Timothy J., Sophia Nimphius, and Michael H. Stone. "The importance of muscular strength in athletic performance." *Sports medicine* 46.10 (2016): 1419-1449.
6. Torres, Lorena, et al. "Muscle Strength and Golf Performance: A Critical Review." *Journal of Sports Science and Medicine*, vol. 10, Mar. 2011, pp. 9–18.

Copyright 2017 The Aasgaard Company. All Rights Reserved

This copy is for your personal, non-commercial use only. Distribution and use of this material are governed by copyright law.