

How to drive – like Tiger

by Paul Read

How is it possible to achieve drive distances of over 300 yards with ease? In recent years, players and coaches have increasingly recognised that adequate strength and conditioning enhances swing mechanics, increases performance and reduces injuries. One of the main goals of training has been to enhance club head speed (CHS), which may subsequently reduce handicap as a result of increased driving distances [1].

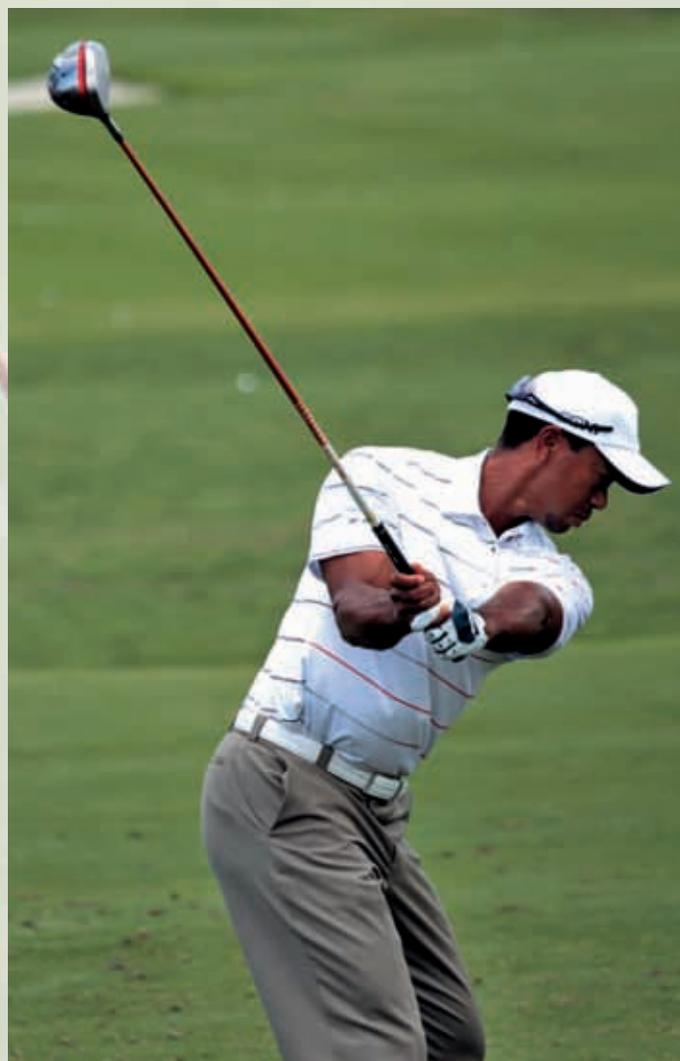
Physical demands

The golf swing is a complex movement of the whole body, with high power outputs (Figure 1). The following muscles have been identified as prime movers:

- quads and hamstrings
- glutes
- groin / inside hamstrings
- back extensors
- abdominals
- lats and pecs [2]

Strength and power

Increases in CHS have been shown following strength and plyometric training [3, 4]. This demonstrates the need to produce sufficient muscular force and power to maximise driving distance.



Downswing initiation – use of: *right hip extensors/abductors and left adductor*



Weight transfer and leg drive – force developed from the ground transferring to: *core, arms and wrists*



Follow-through – simultaneous triple extension of: *ankle, knee and hip*



Figure 1. Downswing sequence: muscle use analysis

✓ **POWER INCREASE**

Reps	Sets	Rest	Load
3-5	5	180s	85-90% 1RM



■ **Coaching cue:** initiate the movement by pushing the ground away from you with your legs.

Figure 2. Deadlift and suggested drill

◆ **Developing primary strength from the ground up**

As discussed above, the golf swing is a whole-body movement involving multiple muscles and joints. Force is produced from the ground up, transferring through the core to the arms and wrists. Therefore, developing strength that will yield increases in performance using whole-body lifts, such as squats and deadlifts (Figure 2), should be the focus – rather than bicep curls and tricep push-downs which involve single muscle and joint actions.

◆ **Power relationships with CHS**

A key study highlighting the dynamics of CHS reported that a countermovement jump (Figure 3) was the most significant exercise for increases in power [5]. This is probably because an initial forceful muscular contraction is generated from the legs and hips (to initiate the downswing), and also because elite players swing faster throughout the entire downswing [6]. This highlights the importance of applying force quickly. Plyometrics, ballistic exercises (including jumps and medicine ball throws) and weightlifting movements are recommended to enhance these qualities.

Players should also keep in mind that long slow continuous running can lead to reductions in strength and power [7]. Therefore, steady state jogging to improve conditioning should be avoided in favour of sprints and interval training approaches.

◆ **Upper body**

The impact of chest strength on CHS has been noted as significant, with the pecs very active in the downswing [8]. Subsequently, pushing exercises may be incorporated – progressing to power exercises such as bench throws and medicine ball chest passes. However, while the research has highlighted the significance of the chest, it is worth

remembering that in other sports involving forceful rotational contractions, such as boxing, shot put, tennis and baseball, we see a shift towards greater contributions from the legs once mastery of the sport has been achieved. Thus over-use of isolated upper body movements may prove counterproductive.

Whilst developing chest strength may be beneficial, strength of the antagonist muscles (acting on the opposite side of the joint to support movement and preserve joint stability) is essential. If an imbalance exists there is an increased chance of injury and reductions in limb speed and accuracy [9]. This emphasises the need for a balance of push/pull exercises as part of an effective programme.

◆ **Training rotation**

It is often considered that direct training for the torso is the best way to enhance power in the golf swing. This approach is questionable, as evidence exists of increases in CHS when force is produced from the ground up, commencing from the legs and sequentially transferring to core, shoulders and arms during the downswing [10]. This re-emphasises the importance of training the lower body for greater CHS. Furthermore, leg power has been shown to display the strongest relationship with increased driving distances [11].

While rotation is a major component of the golf swing, exercises such as Russian twists and abdominal crunches should be avoided due to the repeated flexion (forward bending) and rotation in the lower back, which may increase the chances of spinal injury [12]. Remember, the core is never a power generator: power is generated in the hips and transmitted through a stiffened core. Therefore, it is recommended that training should emphasise anti-motion control (aiming to prevent rotation in the lower back) to reduce spinal torques, with strength/power development promoted from the extremities (legs, hips, shoulders). Exercises such as the golf-specific cable

✓ **POWER INCREASE**

Reps	Sets	Rest	Load
3-5	3-5	180s	BW



■ **Technique point:** dip into a quarter squat (as shown) and immediately jump as high as you can – driving your arms through, extending at ankles, knees and hips.

■ **Coaching cue:** aim to keep the period between the end of the lowering phase and the drive phase as short as possible and jump maximally.

Figure 3. A countermovement jump (dip position) and suggested drill

✓ POWER			
Reps	Sets	Rest	Load
3-5 each side	3-5	180s	70% 1RM



Start position Finish position

■ Coaching cue: initiate the rotational movement by driving with the legs and rotating at the hip, not in the lower back.

Figure 4. The golf-specific cable woodchop and suggested drill

woodchop (Figure 4) and medicine ball rotational throws should be included because they promote force production from the ground up and have strong relationships with enhanced CHS [13].

Flexibility and power

Adequate mobility is a key requirement for the golf swing to allow sufficient rotation, achieve a full turn and avoid movement compensations that could lead to injury. Of particular importance are ankle, hip, thoracic spine (mid-upper back) and shoulder mobility. Key stretches to perform promoting mobility in the above areas should be performed at the end of training, after games and in the evening before bed (Figure 5).

Conclusion

Training to enhance power in the golf swing should emphasise whole-body movements which teach players to produce force from the ground (via the legs and hips), transferring to the core and upper body. This is why multi-joint, multi-muscle movements are encouraged to develop strength and power. Additionally, developing adequate flexibility for the involved joints (ankle, hip, shoulders), as well as avoiding repeated flexion and rotation of the lower back, will enhance performance and reduce injury risk.

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✓ MOBILITY INCREASE			
Reps	Sets	Rest	Stretch duration
1-2	1-2	n/a	30s for each stretch



Hip flexor stretch Calf stretch

Thoracic spine stretch Pec Stretch

■ Coaching cue: ensure correct form and don't force the stretch. Take a deep breath in and out as you gradually relax into the stretch.

Figure 5. Key stretches to develop mobility of involved joints

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Paul Read
 Lecturer in Strength and Conditioning,
 Gloucester University, UK
 Email: paul@bodyinaction.co.uk

