



# Bringing golf injury prevention to the fore

Sarah Catlow, MFHT, and Lance Doggart discuss golf injury treatment, rehabilitation and prevention

Approximately seven per cent of the UK population participate in golf. Although not traditionally considered a physiologically demanding activity, as a closed skill the margin for error, at all levels of play, is very small therefore regular practise, on and off the golf course, is imperative. The nature of the golf swing requires significant timing and coordination of the musculoskeletal system and as such brings its own unique injuries and associated characteristics. The purpose of this article is to highlight the characteristics of injury in golf, identifying potential treatment and rehabilitation modalities and providing an insight into the intricacies of the game for the therapist.

## Characteristics of the golf shot and golf's physical demands

During a round of golf the golfer will normally hit 18 tee shots, approximately 14 approach shots to the green and two putts on each green. For the average club golfer, the total shots played could range from 80 to 100 per round. Of these, 60 to 80 shots require complex coordination of joint rotations and muscular actions. Carrying a golf bag weighing between 10 to 30kgs, walking intermittently for approximately four to five hours and covering between 8 to 12kms across variable topographical terrain will provide an environment that can physiologically strain the body.

The act of carrying a golf bag weighing 20kgs or more can cause lower back pain because of the potential imbalance in the distribution of weight across the shoulders. Most golfers who carry their bag have a dual strap system where the weight is distributed across the shoulders. However, if the bag is loaded on to and off the shoulders between 80 to 100 times per round, the physical act of doing this will put strain on the shoulders and lower back. In addition to this, the height at which the bag is carried, which is dictated by the length of the straps, can put the weight of the bag below an individual's centre of mass/gravity. This induces poor posture through excessive forward lean and will influence the onset of low back pain. Therefore the combined cumulative effect of walking distance, terrain, intermittent load carriage, height of the load carriage, the act of loading and unloading and the idiosyncratic joint and muscle action could be classified as high physical demand and contribute to the onset of specific injuries.

The complete golf swing is often characterised by the grip, stance and swing. Each of the characteristics not only have variations, depending on the type of shot and golf club used, but can also have idiosyncratic variations that can affect the onset of injury. The grip on the golf club is often the key element to a successful shot. The grip should be firm and secure with interlocking fingers across the hands. It is the firmness and stability of the hands, wrists and elbows at impact that make the golf shot



successful. The stance is often characterised by the feet a shoulder width apart, with back, knees and hips slightly flexed. The degree of hip flexion is dependent on the length of the golf club and there are often variations to this posture depending on the flexibility of the structures around the joints. Reduced flexibility will result in a more upright posture. The swing is often very individual to the golfer and this can be evidenced even at the professional level. However, at upswing the body should be stable with the majority of the movement coming from the arms, shoulders and trunk. During the downswing the hips will translate horizontally with the rear hip internally rotating simultaneously. A similar combination of movement is often evidenced at the knees while the feet remain stable until impact where the rear foot elevates onto the toe. This combination of movement is present through impact as the golfer controls the momentum of the energy transfer.

The stability of the feet, the rotation of the shoulders and trunk, hip translation, asymmetrical hip and knee rotation and the flexion of the back, hip and knees all influence the effectiveness of the golf shot. However, the potential for injury through incorrect posture, timing of muscle activation, inflexibility and lack of co-ordination through muscle weakness is often clearly evident.

## Incidence of injury and characteristics

Golf injuries are usually a result of the collective effect of factors such as incorrect stance, poor posture, a weak or over-tight grip, idiosyncratic swing mechanics and untrained or overused muscles. The cumulative effect of these characteristics make it difficult to isolate one overriding factor. The lower back has been reported as being the most common site of injury in a golfer, accounting for approximately 35 per cent of all injuries.<sup>1</sup> Due to the mechanics of the swing the lower back can be subject to large ranges of rotational motion while in flexion. The subsequent muscular forces associated with this action result in musculoskeletal injury such as muscle strains/pulls and muscle tendon attachment injury, often caused by a forceful golf swing or a sudden shift into the downswing.<sup>2</sup> The elbow is also a commonly injured area with approximately 34 per cent of golf injuries being reported in this anatomical region.<sup>3,4</sup> The two most common problems are medial epicondylitis (golfer's elbow) and lateral epicondylitis (tennis elbow). Both are thought to occur as a result of poor swing mechanics at impact. Medial epicondylitis is thought to be caused by hitting the ground first while lateral epicondylitis may be caused by over-swinging. This is often evidenced by a high elbow at the top of the swing which then 'snaps' or adducts quickly as the club is brought through the



**Table 1. Common factors associated with injuries in golf**

<ul style="list-style-type: none"> <li>● <b>Golf technique</b> – grip type (interlocking or non-interlocking), posture, stance, swing;</li> <li>● <b>Equipment</b> – golf bag weight and carriage, grip thickness;</li> <li>● <b>Environmental</b> – terrain topography;</li> <li>● <b>Skill level</b> – linked to total shots played and handicap;</li> <li>● <b>Age of the golfer</b> – chronological degenerative condition;</li> <li>● <b>Frequency of play and practise</b> – rounds and/or practise per week;</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Duration per round and practice session</b> (number of swings).</li> </ul> <p>Furthermore golfers who carry their bags on a regular basis suffer significantly more injuries to their back and shoulder.<sup>8</sup> Overuse injuries are also linked to poor technique and equipment. These are often evidenced at the grip, such as gripping the club too tightly, incorrect grip diameter of the club or an interlocking grip compared to a non-interlocking grip.</p>
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downswing into impact.

Professional and low-handicap golfers tend to experience more wrist and hand injuries than amateur golfers (27 per cent vs 20 per cent).<sup>4</sup> This type of injury is linked to technique and specifically the timing of the medial rotation of the wrist at impact. The golfers will purposefully aim to 'hit' through the ball, resulting in an increase of impact force (evidenced by the taking of a divot post impact) while the wrist is rotating.<sup>5</sup> Therefore the firmness of the grip, grip size, swing coordination and timing are imperative in reducing the incidence of this type of injury.

Some common aspects are noted in Table 1 above. Although other factors need to be considered such as warm up, play time, handicap and age, the majority of injuries are in effect self-induced because these occur at some point in the golf swing.<sup>6</sup> Unskilled recreational golfers attempting to imitate professionals may induce muscle sprains because their less efficient swing styles (poor coordination and timing) are typically compensated for by greater muscular exertions and poor posture.<sup>7</sup>

## Injury treatment, rehabilitation and prevention

As a therapist there are several factors to consider when objectively assessing an injured golfer. These include:

- posture;
- wrist and elbow rotation and flexibility;

- balance;
- shoulder mobility (external rotation);
- thoracic spine range of motion;
- gluteal strength;
- core strength;
- hip mobility (internal rotation);
- hip flexor/hamstring/calf flexibility.

The objective assessment of these factors, specific to the injury, can provide a clear indication of the potential cause of the injury linked to the golfer's individual playing characteristics. For example a golfer complaining of elbow pain may have medial epicondylitis and this could be the result of an incorrect grip or incorrect positioning of the elbow at the top of the back swing. In this case the therapist would treat accordingly and refer the golfer to the local professional at his or her golf club for swing/grip correction.

The rehabilitation process should be dynamic and golf specific in order to mimic the joint and muscle actions produced in the game. Tables 2 and 3 highlight potential treatments and rehabilitation exercises for the injured golfer.

The management and prevention of many golf injuries can be obtained through the alteration in technique, reduction in practice regimes and adequate warm up phase.

An appropriate warm up for golfers should include a period of aerobic exercise to increase body temperature, followed by stretching of the 'golf muscles' (hands, wrists, forearms, shoulders, lower back, chest, trunk,



hamstrings and groin).<sup>9</sup> A series of golf swings with a progressive increase in range of motion and vigour should then be performed.<sup>10</sup> Only a small proportion of amateur golfers perform appropriate warm up exercises.<sup>11</sup> The therapist could educate golfers about the benefits of warming up with appropriate warm-up routines.



**Above and below:** Holding simple shoulder mobility stretches for 30 seconds can help to warm up the supraspinatus muscle.



**Table 2.**  
**Examples of injury treatment and rehabilitation exercises for the injured golfer**

<b>Soft tissue release</b>	Release tight global mobilising muscles (hamstrings, tensor fascia latae and iliotibial band).
<b>Forearm strengthening</b>	<p>Strengthening the forearm and hand muscles have also been shown to be beneficial in reducing elbow injuries.</p> <p>Hold a golf club half way down the shaft. Medially rotate the elbow so the forearm is parallel to the floor. Rotate the wrist downwards towards the floor and then back up to the starting position. Three sets of 10 to 15 repetitions every other day.</p> <p><b>Ball squeeze exercise</b></p> <p>Grip the ball in the hand of your affected arm, squeeze the ball and keep it held for three seconds, then release. Repeat the exercise for 10 squeezes, twice every other day, increasing the duration of the squeeze.</p>
<b>Thoracic (upper back) mobility</b>	<p>Thoracic mobility is vital in achieving a full shoulder turn while maintaining core and hip stability in the back swing, but it is also important in the downswing transition.</p> <p>Spine mobilisations on a foam roller are a good way to develop thoracic extension and improve a hunched posture.</p> <p>Additionally, kneel down on all fours, place your right hand behind your head, and point your right elbow out to the side. Brace your core and rotate your right shoulder toward your left elbow. Follow your elbow with your eyes as you reverse the movement until your right elbow points toward the ceiling. 20 repetitions each side.</p> <p>Trunk rotation – standing or sitting. Hook your arms around the golf club placed lengthwise across your back. Rotate your trunk and head to the left and hold it there for 20 to 30 seconds. Repeat this on the other side. Sitting reduces the stretch in the lumbar region.</p>
<b>Sufficient core control</b>	<p>Hip mobility restriction is normally due to insufficient core control. Add rotational medicine ball variations and chops/lifts to the rehabilitation programme.</p> <p>In the golf swing, it's essential to have mobility in the hips. Not only does it take the stress off your lower back but it enables you to load weight effectively in the backswing and initiate the downswing with the lower body first. The therapist can add the following exercises to address hip mobility problems:</p> <p>Hip flexor stretches – such as half kneeling, fire hydrant.</p>
<b>Shoulder mobility stretches</b>	<p>The supraspinatus muscle abducts and externally rotates the shoulder therefore stretching must involve adduction and internal rotation. Hand behind back club stretch: grab the golf club behind your back with your right hand. Pull the golf club with the other hand from above while keeping your right shoulder relaxed and your hand over on the left side of your back. Most people will benefit from holding this stretch for 30 seconds.</p>
<b>Stance – ankle and knees</b>	<p>An unstable base has the potential to introduce a number of swing faults. Things as simple as curled toes or tight arches can be a precursor of characteristics such as loss of posture (especially by standing up), over-rotation (over-swinging), or too much lateral motion (swaying and sliding).</p> <p>Increasing the dorsiflexion of the ankle joint is important. This can be achieved via manual therapy and self-myofascial release techniques coupled with joint mobilisations, such as foam rolling the calves - sitting on the ground with one leg on top of the foam roller, while passing the calf over the roller five or six times.</p>



**Above and below:** A warm up including squats helps to stretch the lower back and hamstrings **Right:** Hooking the arms around a golf club placed lengthwise across the back and rotating the trunk and head to help with thoracic mobility



**Table 3.**  
**Therapist advice to the injured golfer**

- Ensure the thickness of the grip is appropriate – get the golfer to check with his/her local club professional. This will often help with the tightness of the grip.
- If the golf bag is carried ensure there is a dual strap system and these straps are adjusted to allow for appropriate weight distribution. Ensure the bag sits above the centre of gravity, that is sitting on the waist or slightly above.
- Consider basic warm up exercises such as a simple squat movement, using the club for support, which helps in stretching the lower back and hamstrings.
- Practise swings – during the warm up start the swing with the club held parallel to the ground and gradually work down to a normal starting position.
- Recommend a strength programme specific to core and lower back.
- Refer the golfer to their local club professional for guidance on grip, posture and swing technique.





## Summary

The golf swing is a complex coordination of joint rotation, muscle action and body stability. The potential for individual variation is significant, however, like all injury in sport, rehabilitation is most effective when it is tailored to the individual, the whole chain is considered and it is sport specific. In golf this is specific to the grip, posture and swing. Many of the overuse injuries can be addressed through alterations in technique and practise regimes, which can allow the golfer to keep playing throughout the therapist's treatment programme. Referring the golfer to the local club professional for technical advice is often useful to support the rehabilitation process and prevent the reoccurrence of the injury. Minimising 'down time' for the golfer is the key to success and enjoyment of the sport.



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To read an article by Sarah and Lance on kinesiology taping, featured in *International Therapist*, Issue 114, go to [www.fht.org.uk/tape-update](http://www.fht.org.uk/tape-update)

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# FHT awarded for membership engagement

The FHT was delighted to receive a Mark of Excellence for Best Membership Engagement at the Association Excellence Awards 2016, held in London on 26 February.

Jennifer Wayte, President, Karen Young, Editor and Communications Manager and Jade Dannheimer, Online Manager, attended the Association Excellence Awards 2016 in London on Friday 26 February, and were thrilled to receive this recognition from the judges, for the FHT's commitment to you, our members.

The Association Excellence Awards specifically evaluate and measure the success and relevance

of professional associations, ensuring that members are at the heart of everything we do. The Membership Engagement category assessed us and our fellow finalists on how we interact with members, the benefits that members receive from our communications and the professionalism we exhibit.

Jennifer Wayte, President, said: 'We were incredibly proud to be shortlisted alongside some very prestigious and well-respected professional associations. To be awarded a Mark of Excellence among such strong competition is a real honour, and we are delighted that

Jade Dannheimer, Jennifer Wayte and Karen Young receive the Mark of Excellence for Best Membership Engagement on behalf of the FHT

the commitment of our staff in delivering good member communications has been recognised. We would also like to offer our congratulations to the category winner, the Royal Pharmaceutical Society, GS1 UK, the Management Consultancies Association and the Law Society of Scotland, who were finalists. It was a tough category by all accounts!

## Thank you

Our thanks to all those members who regularly engage with and support the FHT – without you, this achievement would not have been possible.