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## **1. Golf Injuries – Cause, Effect & Management**

**By Sandy Jamieson**  
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### **Introduction**

The Melbourne Golf Injury Clinic has assessed and treated over 4000 golfers and this article outlines a template that therapists and golf coaches can use in their own practice to identify the cause, effect and management of golf injuries or patients who are unable to participate in the sport of golf as a result of predisposing injuries

When analyzing different golf groups, from club players to amateurs to club professionals and tour players, it is clear that each sub-group is more susceptible to specific injuries.

This short article is to increase awareness in the golf community about the causes of golf injuries as a result of: -

- Poor swing biomechanics
- Swing misconceptions
- Ineffective co-ordination of the body segments within the golf swing.
- Muscle imbalances and postural changes associated with a dominantly one-sided sport.
- Underlying pathological and predisposing factors that inhibit golf participation and swing mechanics

We shall discuss the common golf injuries incurred, and their cause, effect and management. Outlined are two injured golfers who attended the clinic, one with a lumbar spine disorder, and the other with tennis elbow. We have taken them through a golf specific musculo-skeletal and video screening.

**Doctor 1:****62 year old male lawyer****28 Handicapper (right handed)**

Subjective and Objective Summary:

Lumbar Spine: Lx 2- 3 Lumbar spondylosis

- Prolonged sitting through desk work and driving adds up to 7 hours 30 minutes per day in fixed a dynamic flexion
- Standing in flexion with rotation over patients 6 hours 45 minutes per day
- Hobbies include gardening/reading /social golf. All activities in the flexed position.
- Never had a golf lesson and therefore has poor swing concepts, exceptional flexion and right side flexion at impact position. “ The Crunch Factor”
- Has been using stiff stainless steel shafts that have not been fitted to his swing/ handicap and body type.
- No warm up routine before teeing off.

**Swing Faults / Misconceptions:**

The modern golf swing is sign posted by a quiet and stable lower body with the majority of the body's rotation force coming from the torso. Stiff or frozen lumber spine reduces the golfers ability to obtain the rotation needed to produce consistency and power simply. Golfers with this condition tend to make up for the lack of spinal range by over active arm and hand actions or over active lower bodies or both. These golfers tend to lack consistency and distance. In many cases these golfers have what is known as a reverse pivot whereby their weight moves toward the target on the backswing and away from it on the downswing. A result of this pivot is the Crunch Factor at impact as the body struggles to get into some sort of effective alignment.

**Common Points of Reference in regard to weakness in the Kinetic Chain:**

- Hip flexors especially rectus femoris tight and shortened.
- This leads to anterior pelvic tilt and compression of the L3-4-5 and S1 vertebra
- The compression leads poor rotation in the lumbar spine causing over compensatory movement of the more mobile thoracic spine and the lateral sliding of the hips on the back swing and follow through placing a further shearing force on the lumbar spine.
- Multifides and transverse abdominus tend to be weak and results in poor lumbar stabilization, which can lead to an exacerbation of symptoms, associated with lumbar spondylosis.

**Common Physical Management:**

- The physiotherapist who has an overall understanding of golf and the associated biomechanics can carry out a full musculo-skeletal screening.
- A registered club fitter or contact the PGA of Australia can also carry out club fitting.
- A referral to the local PGA Professional asking for a report in the form of a video analysis still print out can be provided.
- A gentle stretching and postural reeducation program should be commenced e.g. hip flexors, quadratus lumborum, glutei and transverse abdominus stabilization.
- Ergonomic Assessment and workplace changes are essential.
- Anti-inflammatory prescribed by the doctor

**Common Technical Management – Coaches Advice:**

The key to improving golfers with lack of lumbar spine rotation starts with massage, mobilisation and stretching. This then moves on to golf specific movements where lower body rotation is restricted and the golfer is encouraged to try and create extra spinal rotation. As a result of this a proper pivot action should start to occur where by the golfers weight will move away from the target in the backswing and towards it in the downswing.

**Doctor 2:**

**45 year old female secretary –  
17 Handicapper (right handed)**

Subjective and Objective Summary:  
Tennis Elbow

- Prolonged computer work that has caused upper body postural changes e.g. Increased upper thoracic Kyphosis. This leads to weakness in the shoulder girdle stabilizers, serratus anterior mid and lower trapezius and rotator cuff muscle group bilaterally.
- On examination the left latissimus dorsi and triceps were significantly weak this tends to occur in female within this age group. This will cause the hands to over compensate and cause the agonistic muscles to squeeze more readily on the golf club e.g. flexors digitorum fundus placing pressure on extensor carpi radialis longus which is further placed under strain.
- Her golf grips were worn and also too large for her hands.
- She practices on golf mats 3 times per week (300balls).
- She read a golf article on keeping the head down and the left arm straight.

**Swing Faults / Misconceptions:**

There is a close association between Tennis Elbow and a belief that the left arm should be locked straight during the backswing and downswing. Causing shortening and tightening of the muscles in the left arm placing extra stress and strain on tendons in the elbow especially at impact. Incorrect grip size has a direct effect on grip tension and in this case her grip tension was far too tight causing even more shortening of the muscles in her forearms. Grip tension should not be so tight that it wears furrows in the rubber where a golfer's thumbs and fingers are placed.

Driving range mats and very hard ground allow for very little give at impact and tend to refer the shock of the strike up into the golfers hands and arms and in a case such as this only flares intensifies the tennis elbow.

**Common Points of Reference in regard to weakness in the Kinetic Chain:**

- With triceps being weak on the left side this places extra stress on the extensor carpi radialis longus origin when the golfer extends their arm at impact.
- As stated poor shoulder stabilizers will cause over active hands thus using small muscle groups rather than the trunk stabilizers (golf muscles).
- Poor body awareness and skill acquisition will result in the doctor hitting the ball with their arms alone rather than using their trunk stabilizers full and efficient arm levers.
- Biceps may also be over active – Check the muscle tension, muscle length and tendon thickness on the left compared to the right.
- Poor range in the balance between the pronators and suppinators may also be an issue

**Common Physical Management:**

- The physiotherapist who has an overall understanding of golf and the associated biomechanics can carry out a full upper body and trunk stability assessment.
- Grips can be assessed and changed by a local PGA Professional. The Arthritis Foundation also have grips
- A referral to the local PGA Professional asking for a report in the form of a video analysis still print out can be provided.
- Deep massage to biceps extensor carpi radialis longus, pectoralis major and minor, long flexors of the wrist and fingers.
- Also stretches to the above.
- Thera- tubing stretching exercises triceps latissimus dorsi, serratus anterior rotator cuff group.
- Anti-inflammatory prescribed by the doctor.
- Local injection when the tennis elbow is more focal

**Common Technical Management – Coaches Advice:**

An understanding that the left arm should be naturally extended not tense. Having a greater focus on the right arm in the swing to control the width of swing arc.

The fitting of correct sized grips and a focus on having grip pressure that enables a hold on the club without digging into the rubber.

Reducing the number of full shots hit in practice and if balls are going to be hit at the range to do so of the rubber tees provided thus avoiding the impact with the ground.

References and further reading:

1. [www.golfmed.net](http://www.golfmed.net)
2. **The Body and Golf CD Rom** - Ramsay McMaster
3. **Poor Motor Patterns that Cause injury and Golf Rehabilitation Exercises CD Rom** - Ramsay McMaster.
4. **Musculo-Skeletal Injury Questionnaire for senior golfers** - E. Fox, DM Lyndsay and A,A Vandervoort.
5. **Strength Training and Injury Prevention for Professional Golfers** - J.H Hellstom
6. **Back Pain in Novice Golfers a One Year follow-up** – A. Burdorf et el

## **2. The Importance Of Hydration For Golfers**

### **What is dehydration?**

Dehydration occurs when the body loses fluid faster than you can replace it. Water is one of the main constituents of the human body, and therefore it is essential for health and optimal sports performance to maintain your hydration levels.

Dehydration is most commonly caused by:

1. Lack of fluid intake
2. Sweating – or loss of fluid from the body

Contrary to popular opinion the feeling of thirst is not an accurate measure of dehydration. By the time you feel thirsty you are already in a dehydrated state!

### **How does dehydration affect my golf game?**

In order to play your best your body needs to be physically and mentally at its best. Dehydration has the following effects on your body:

- Dehydration reduces your fine motor control. Fine motor control is the ability to use your small (but important) muscles of the body efficiently. This includes the muscles of the hand and the forearm, both of which are important to the golfer Eg grip on the club, control of the putter
- Water aids in joint lubrication of the body, which allows for better 'feel'. That is the ability to know where your body parts are in space and time and to correct their positioning. This is crucial to swing mechanics and timing in the golf swing
- Mental concentration is also affected by dehydration. The ability to maintain focus and concentrate over the full 18 holes is pivotal to a successful round.

### **How can I tell if I am dehydrated?**

There are 3 main ways to measure your hydration:

1. Thirst – if you feel thirsty, or dry in the mouth and throat you are already in a dehydrated state
2. The 'Colour' test – a very basic way to determine your hydration status is to use the colour of your urine as an indicator. The darker the colour the more dehydrated you are.
3. Pre and Post weigh ins – If you have a set of scales handy you can weigh yourself prior to playing and immediately after playing. Generally the amount of weight lost can be equated to fluid lost by the body. As a rule of thumb 1kg of weight is equal to about 1 litre of fluid intake to replace the body weight. However keep in mind that some weight may have been lost through burning fat/carbohydrates if the level of activity was high enough.

I would suggest the second method as it is easy, simple and gives you an immediate indication.

**What is the best drink for hydration?**

Although the body has a high water content, water is not particularly the best fluid to use for rehydration. This is because water is not effective in hydrating the body. When you sweat you lost both water and sodium (salt) and therefore you need to replace both. Drinks which contain sodium are sports drinks such as PowerAde and Gatorade. Most sports drinks have the appropriate mixture of water, sodium and other requirements to best replenish the body.

Fruit juices and fizzy drinks are not ideas as they are full of sugar and contain low amounts of sodium. 'Energy' drinks that contain caffeine should be avoided as caffeine further dehydrates the body.

Another important tip to remember is that eating whilst you ingest fluid also assists the body with retaining fluid and is an important step in the recovery process.

**How much do I need to drink?**

As we all know, humans are very individual and as such each person will be different when it comes to hydration. Some people re-hydrate very quickly, whilst others have to actively think about drinking enough fluid. In order to determine your fluid requirements you should play around with drinking different amounts of fluids in different environmental conditions, testing your hydration ('colour' test) to determine your status. Sometimes it is beneficial to keep a diary and record what type and how much fluid you have taken in during the day in order to determine your needs.

## **A Hydration Plan For Golfers**

Because fine motor control, muscle feel and concentration are all important factors to a golfer it is important to have a hydration plan, especially if you are playing in tournaments. The four basic steps in any good hydration plan are:

### 1). Prepare yourself

- begin hydrating yourself in the few days prior to your tournament
- drink regularly and with food
- drink throughout the day and into the evening
- on the morning of your tournament commence drinking the correct fluid early on in the day. This is because during sleep our body sweats and hence loses fluid, so it is very difficult to maintain your hydration over night.

If you have an early tee time you should ensure that you have had something to eat and drink before you start playing

### 2). Maintenance during your round

When you are playing a round of golf (especially in a tournament) the last thing you want to be thinking about is if you are drinking enough. However we know that hydration is going to be integral to playing well. If you have prepared yourself as outlined in step 1 your main task during the round is to maintain your level of hydration. This means ensuring that you have sports drink available to sip on during the full 18 holes, rather than having to stop and find something to drink. If you have a caddy it is a good idea to put them in charge of ensuring you finish your allocated amount of fluid over the 18 holes (a rough idea would be about 2-3 bottles of sports drink).

### 3). Recovery

If you are playing in a tournament which goes over multiple days it is important to include recovery into your hydration plan. As soon as you have finished your round you should commence rehydrating in preparation for the following day. If you are playing in hot, humid conditions this is especially important.

4). Assess

Don't forget you need to assess your levels of hydration. You should do this before and after your round, and in the evening. This will allow you to implement your hydration plan in the best way possible to maximise performance.

In summary, don't underestimate the importance of hydration. It is easy to forget about it, especially if you are focussing on technical aspects of your game, however it can have a huge influence over all areas of your game and should be made a priority. Once you have determined your individual needs and get used to using a hydration plan it can become easy to make sure that this aspect of your preparation is taken care of.

Happy golfing!

### **3. Myotherapy**

#### **What is it?**

Myotherapy in its literal translation is 'Muscle' therapy. Myotherapy is the scientific and clinical care and conditioning of Musculoskeletal Injuries and Conditions, as well as the fine-tuning of muscular performance in a given context.

Fully qualified and Registered Myotherapists are trained to high standards in the care of soft tissue structures of the human body and its consequential biomechanical and injurious effect on the skeleton, including joint pathology.

Myotherapists base their clinical care plan on strong Musculoskeletal Assessment skills, to arrive at a conclusion as to the nature, effect and treatment requirements of each individual.

Palpation and hands-on skills are a hallmark of the Myotherapy profession. Myotherapists place great emphasis on the importance of the 'feel' and 'integrity' of tissue and structure in the body and its deviations from the norm. In treatment terms, Myotherapists utilise a series of modalities, including:

- Soft Tissue Manipulation Techniques.
- TENS (Transcutaneous Electrical Nerve Stimulation).
- Dry Needling.
- Deep Tissue Massage Techniques.
- Corrective and Performance Enhancing Exercise Prescription.
- Cryotherapy (Cold Therapy) & Heat Therapy.
- Advanced Myofascial Stretching Techniques.

## **Myotherapy & Golf**

With a great level of Golf Specific Anatomical and Physiological knowledge base, Myotherapists within the Melbourne Golf Injury Clinic, the Australian Institute of Sport (AIS) and associated companies, are highly trained to treat and physically train golfers of all levels and ages.

Golf is a physically demanding activity, which requires the body to maintain and sequence muscles in the correct capacity over a long period of time and with great finesse. Myotherapy can be implemented extremely effectively in the physical treatment, maintenance and re-training of the body specifically to the demands of each golfing body type and game plan.

Recognised Myotherapists can assist in the complete care and conditioning programming and re-programming of individual golf requirements.

## **4. National Sports Information Centre**

The National Sport Information Centre, a program of the Australian Sports Commission has an extensive collection of golf books, journals and videotapes.

Listed below are articles and research papers that may be ordered from the NSIC.

Order form and prices can be found at the website -  
<http://www.ausport.gov.au/nsic/docdel.html>

### **Contact Details**

#### **National Sport Information Centre**

Australian Sports Commission  
PO Box 176  
Belconnen ACT 2616  
Australia

Email: [nsic@ausport.gov.au](mailto:nsic@ausport.gov.au)

Telephone: +61 2 6214 1369

Facsimile: +61 2 6214 1681

Internet: <http://www.ausport.gov.au/nsic/>

**Adam Scott: how similar is my swing to Tiger's? See for yourself...**

Harmon, B.

Australian golf digest (Sydney, Aust.)

ISSUE: Apr 2004 43-47

KEYWORDS: golf | technique | swing | Scott, A. | Woods, T.

ACN-0912

**Get wired.**

Mickelson, P.

Australian golf digest (Sydney, Aust.)

ISSUE: Apr 2004 48-52;54

KEYWORDS: golf | golf club | design | technology

"I'm using the latest technology to upgrade my game. Here's how you can too."

ACN-0913

**Nick's excellent adventure.**

Clarke, R.

Australian golf digest (Sydney, Aust.)

ISSUE: Apr 2004 90-95

KEYWORDS: golf | biography | man | Australia | Flanagan, N.

"Newcastle amateur Nick Flanagan reflects upon past deeds and his amazing year ahead as he prepares for this month's Masters."

ACN-0914

**What now for David Duval?**

Diaz, J.

Australian golf digest (Sydney, Aust.)

ISSUE: Apr 2004 96-102

KEYWORDS: golf | biography | man | United States | Duval, D.

ACN-0915

**Earl Woods.**

Yocom, G.

Australian golf digest (Sydney, Aust.)

ISSUE: Apr 2004 104-107

KEYWORDS: golf | biography | man | United States | Woods, E. | Woods, T.

"A roaring ride with Tiger's dad as he ponders hobo coffee, demolition men and, of course, his famous progeny."

ACN-0917

**The hot list.**

Stachura, M.

Australian golf digest (Sydney, Aust.)

ISSUE: Apr 2004 108-118

KEYWORDS: golf | golf club | ball | evaluation

"For the first time in history, we name the equipment of the year and tell you what to put in your bag - right now."

ACN-0918

**Body size and somatotype characteristics of male golfers in Japan.**

Kawashima, K.

Journal of sports medicine and physical fitness (Torino)

ISSUE: 43 3 Sept 2003 334-341

**KEYWORDS:** golf | somatotype | anthropometry | adult | man | japan | elite athlete | professional | athlete | non-competitor | case-control study | body composition

**Aim:** the aim of this investigation was to compare the physical characteristics and somatotypes of 4 Japanese male golfer groups with 2 non-golfer control groups. **Methods:** sixty-three male golfers, professional golfers (PR, n = 11), collegiate golfers (CO, n = 24), general amateur golfers (AM, n = 13), collegiate recreational golfers (RE, n = 15), non-golfing college student (CG, n = 45) and a senior population of non-golfers as a control group (SC, n = 20), for a total n = 128. They were somatotyped, according to the Heath-Carter anthropometric method.

**Results:**

the results show that the categories of the mean somatotypes of PR (3.8-5.8-1.6), CO (4.7-5.6-2.2), AM (3.3-4.4-2.6) and RE (3.7-4.8-2.7) were endomorphic mesomorph, SC (4.7-3.9-2.1) was mesomorphic endomorph, and CG (3.8-4.3-3.3) was central, respectively. | The anthropometric variables that best discriminated between skilled and unskilled golfers were body weight, calf skinfold, calf girth, and femur width, with 82 % correctly classified PR and 83 % correctly classified for CO. Secondly, combination of sum of 4 skinfolds, biceps girth and humerus width, with 72 % correctly classified PR and 75 % correctly classified for CO. **Conclusion:** within the Japanese golfer groups, there are differences between golfers and non-golfers with respect to somatotype, body size and composition.

**Results**

suggested that PR showed significantly larger limb girth than other groups. Somatotypes in male golfers tend to increased mesomorphy, related to skill level.

ACN-1712