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1. Golf Swings Cause Back Pain

By Ramsay McMaster
Golf Physiotherapist

“It’s a Myth”- Part 1

On being asked to do an article on back pain and golf, I would imagine that the usual format is to relay the message that golf swings can cause back pain rather than studying the true golf specific cause and effect.

I used this opportunity to integrate golf coaching with physiotherapy by accessing Peter Knight and Sandy Jamieson, two of Australia’s leading coaches. I have also included part of my Golf Specific Assessment System to promote the following objectives on back pain and golf.

1. Try and stimulate thought provocation on professionals who assess and treat golfers from a 'sports specific' perspective.
2. Focus on golf specific rehabilitation rather than Sports Medicine recipes.
3. Look at golf rehabilitation from a coaching/equipment and 'golf culture' point of view.
4. Give you a sample of golf specific systems that are essential in looking at a sport such as golf.
5. Outline not only recent literature but also historical literature and observations that have caused the myth that golf swing causes back pain.

Here are my "Back Nine" factors / Check List that cause back injuries in golfers:

1. Poor education on golf swing fundamentals:

The majority of back injuries do not occur in the presence of a good golf swing biomechanics but through poor motor control & inefficient technique. Most golfers are aware of the benefits of being taught the swing fundamentals to produce an efficient swing but are unaware of how this will lead to a safe swing from an injury prevention perspective. Some golfers initially are taught by family members who may have the best intentions but are not qualified to teach and may indirectly cause injury.

The forces placed on the lumbar spine during the golf swing have been found to be higher in amateur players than professionals. Hosea et al (1994) found that amateurs produce up to 80% more peak lateral bending and shear loads than professional golfers. By performing good golf fundamentals it will not only promote efficient kinetic & motor patterns. It will also allow the spine to operate in safe ranges throughout the golf swing. The PGA Professional, by teaching the correct fundamentals, will prevent swing breakdowns that inevitably lead to spinal injury.

2. Poor public awareness in regards to dynamics & force of the golf swing:

Many golfers perceive that golf is a leisurely pastime rather than a sport. This leads to the view that people do not recognise the golf swing as an athletic movement. Hosea et al (1990) found that there is eight times the body weight being forced through the spine (L3-4 motion segment) during the golf swing in both amateurs and professionals. Compression loading of the inter-vertebral discs can be up to 7500 N although Adams and Hutton (1988) produced disc prolapses in cadaveric studies at just 5448 N. The majority of golfers do not have an opportunity to realise this & therefore do not train specifically or prepare for this movement

3. 'Black Sheep' Sports Therapists/Trainers

The majority of Therapists/Trainers in this country are capable of servicing golfers, however, there are a minority who have minimal or no understanding of the biomechanics of the golf swing & the culture of the sport.

At elite level, especially, there are some therapists who feel ownership of the golfer & feel threatened by getting second opinions from other professionals within the golfing community who may be able to help further the golfer's welfare. This is a failed viewpoint in itself as elite golfers travel worldwide & will seek other opinions themselves.

Poor communication between primary provider and secondary provider therapists is also a problem as the player may be given confusing or conflicting diagnosis resulting in doubt & anxiety. These factors are career threatening at this level of golf as an "acute niggle" can soon become a chronic problem.

4. Swing Misconceptions lead to back injuries

Most golfers actually practice the wrong motor patterns and set up positions, as a result of what they read in magazines and watch on television & videos. These are actually one or two-dimensional stimuli.

The golf swing is however, a three dimensional movement, so what they are seeing may be wrongly perceived or misconstrued. Those trying to copy these actions without external monitoring (using video or the golf coach), exacerbate the swing misconception.

An example of this is following the erroneous instructional message of keeping your head down and fixed during the golf movement which will have an obvious detrimental effect on the cervical and lumbar spine.

5. Club Fitting and Equipment

Using correctly fitted equipment is extremely important and if not properly addressed will lead to back injuries in golfers. A common example of poor club fitting seen everyday on the golf course is 'little Jimmy using Daddy's clubs' Syndrome. In this scenario a physically under-developed child with poor trunk & shoulder girdle stability is using excessive levers as a result of clubs too long for them.

Another group prone to spinal injury is golfers who buy incorrectly weighted and balanced clubs. Rather than letting the club do the work, they drive the club head into impact creating a whiplash effect on their bodies at impact & follow through from poor sequencing of feet, knees, hips, shoulders, arms and hands. This results in spinal injury.

Additionally, consider golf shoes in this category. In regards to shoes & golf swings there is a large lateral weight transference that can lead to increased sheering force on the spine at impact and follow through, if golf shoes are not correctly supported. The golfer with poor fitting shoes walks approximately 8km placing stress on most joints in the body.

6. Short game affects long game

This spinal injury results in predominantly low handicappers, elite amateur golfers & Tour Players who spend the majority of their practice time on their short game e.g.; putting & chipping. In the putting position the lumbar spine is kept in a very fixed posture & position with rotation mainly coming from the thoracic spine. These golfers are in prolonged fixed golf postures, which can "turn off" multifides, transverse abdominus & other core stabilisers. They then return to full swings where they take this poor recruitment pattern into their long game e.g.: driving. This can obviously place a lot of stress on the lumbar spine leading to injury.

7. Predisposing Factors

Most golfers under this category have pre-morbid or residual spinal or peripheral joint pathology. Particularly in the older generations, degenerative spinal changes such as spinal stenosis, disc prolapse or facet joint arthropathy are often the cause of back pain and sciatic symptoms (Weisel et al, 1982).

Other extrinsic factors can be excessive i.e.: gardening before playing. Most gardening activities are in a “pulling motor” pattern that can reinforce flexed postures. In addition, prolonged sedentary work e.g.; driving, computer work etc., can result in poor core stability and slumped posture which is taken to the golf course.

8. Training Volumes

This is probably the most apparent cause of back injuries in golfers. You will see this golf animal down every driving range in the world "hitting buckets of balls with terrier like tenacity" with no goal or objective except to "smash" golf balls.

The main problem with this is that it will cause muscle fatigue & the overcompensation of poor motor patterns in the golf swing. This will in turn lead to golf muscle recruitment breakdown causing excessive compensations of the arms, shoulders & hips. Poor trunk stability follows resulting in back injuries.

Care needs to be taken to ensure the player warms up correctly for golf. Once they are adequately warmed up and being hitting balls they should gradually increase their range of movement and force of the swing. E.g. begin practice hitting short pitch shots (10 –20 metres) and perhaps increase the length of those shots in 5 metre increments over the first dozen or so shots

Please also revisit # 6.

9. No golf rehabilitation system within your clinic

Golfers are creatures of habit. They have their own culture and uniquely, their own swing. Golfers respond to routines, habits & systems e.g. every golfer has a pre-shot routine prior to hitting the golf ball; that is the nature of the sport. The best approach to prevent golf injuries is to have a golf specific screening program.

Therapists should also provide golf specific workshops that include correct golf warm-up and injury prevention protocols to golf clubs & local golf communities. In addition to this, setting up golf specific fitness systems with local PGA Professionals will give the therapist a stronger understanding of the components of the golf swing & how it breaks down. A lack of systems will result in a poor understanding of how to prevent back injuries in golf.

A case study by Grimshaw PN & Burden AM (2000) showed that with a 3-month program of physical conditioning and coaching, a golfer with low back pain was able to play pain free. He achieved this by reducing the load on his spine with a correct technique, and strengthening weak muscle groups.

In 2003, physiotherapists and coaches are now using biomechanical analysis as part of their golf system to confirm and diagnose back injuries in golfers an example 2003 Physiotherapists are now using biomechanical analysis to confirm and diagnose back injuries in golfers.

In conclusion, I believe that after seeing over 4,000 golfers that a good golf swing itself and a golfer with a correct golf specific training program will prevent back injuries.

I have attempted to give you a practical checklist & have enclosed two tables you may photocopy to cover a cause and effect list for your golf clients.

NINE HOLES IN YOUR BACK CARE CHECKLIST

GOLF COACH / PHYSIO SYSTEM

	X ✓	ACTION PLAN
HAS SWING EDUCATION BY A QUALIFIED GOLF COACH?		
DOES THE GOLFER UNDERSTAND SWING FUNDAMENTALS?		
IS A SECOND OPINION REQUIRED?		
IS THERE A SWING MISCONCEPTION?		
HAS EQUIPMENT BEEN CHECKED?		
WHAT IS THE LONG GAME / SHORT GAME RATIO?		
HOW LONG ARE THEIR PRACTICE SESSIONS?		
ANY PATHOLOGIES OR FIXED POSTURES?		
PERSONALISED GOLF REHABILITATION PRESCRIPTION?		

X = Needs Attention ✓ = Corrected

NINE HOLES IN YOUR BACK CARE CHECKLIST

GOLF PATIENT SYSTEM

Name _____

Handicap _____

Plays **Left / Right** Handed

	X ✓	DESCRIBE
DO YOU USE A PROFESSIONAL?		
WHAT ARE THE IMPORTANT FACTORS IN A GOLF SWING?		
WHAT SWING MISCONCEPTIONS DO YOU BELIEVE IN?		
DESCRIBE PREVIOUS GOLF REHABILITATION		
HAVE YOU HAD YOUR CLUBS FITTED?		
HOW LONG DO YOU PRACTICE FOR?		
HOW MANY BALLS WOULD YOU HIT AT ONE PRACTICE SESSION?		
HAVE YOU HAD ANY OTHER INJURIES/ RELEVANT ISSUES		
DO YOU KNOW THE DIFFERENCE BETWEEN GOLF SPECIFIC TRAINING AND GENERIC TRAINING?		

X = Needs Attention ✓ = Corrected

Ramsay McMaster is Consultant Physiotherapist to the Australian Institute of Sport Golfing Unit, the PGA's of Australia, New Zealand and Great Britain.

Ramsay established the world's first Golf Injury Clinic in 1992.

Resources:

- The Golf Fitness Systems CD Rom Level 1 & 2
- Training for Golf CD Rom
- The Body and Golf CD Rom
- www.golfmed.net
- www.golfspan.com

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2. Non-Traditional Approach to Training

By Peter Knight

NSW Institute of Sport Golf Coach

The history of coaching in all sports has led to us adopting those methods that seem to work best. This evolution has occurred mainly through trial and error. In years past much the understanding of technique (for example) came from what was visible and also through what great athletes believed they did.

The advent of the use of video, force plates, biomechanical support, high-speed cameras, movement sensors that can be placed on the body and a range of other scientific interventions it is now possible to quantify and explain any outcome of a movement performance in terms of technique.

Having this understanding is at once comforting and limiting. Comforting because we can (with a reasonable degree of confidence) dissect any performance and highlight the visible movement patterns – both good and bad.

It is limiting because we can easily be lulled into thinking that we now know best how to deal with just about any situation. In golf coaching errors can be explained by analysing technique. However the underlying cause of the technical error could be a particular thinking pattern, compensation for poorly fitted equipment or something else entirely. The belief that everything can be 'fixed' once the technique is correct can prevent us from looking for other ways to enhance performance.

For the purposes of this presentation the historical progress of coaching thought has been divided into three sections; traditional, new and non-traditional. I will consider these sections as they relate to my sport, golf.

	• Traditional	• New
Physical	<ul style="list-style-type: none">• Weight training is harmful to the golf swing.• Running is bad for golf as it tightens the muscles.	<ul style="list-style-type: none">• Medical and physio screenings• Strength training programmes• Core stability• High levels of fitness
Mental	<ul style="list-style-type: none">• Jack Nicklaus said that if a player needed the help of a sports psychologist then they shouldn't be on the professional tour.	<ul style="list-style-type: none">• Psych tools such as High Performance Thinking System.• Post round debriefing• Individual psych consults.
Technique	<ul style="list-style-type: none">• Based on what the best players in different eras thought they did.	<ul style="list-style-type: none">• Use of video, computer analysis, biofeedback, 3D models
Tactics	<ul style="list-style-type: none">• This is historically a strong area of preparation but is limited to on-course strategies	<ul style="list-style-type: none">• Course yardages, pin positions• Professional caddies
Nutrition / hydration	<ul style="list-style-type: none">• A beer addresses both of these considerations at the same time.	<ul style="list-style-type: none">• Better education• Less alcohol• On-course snacks

Non-traditional

While there are considerable advancements to be made in traditional and new approaches to coaching areas it is arguable that the greatest advancements available to us occur in areas of coaching and performance that are non-traditional.

In recent years the catchphrase 'holistic' has been used to describe the approach taken to training and preparing athletes for competition. My generalised observation of coaches who take this approach is that planning attends very nicely to all the traditional and new training issues along with assessment modalities and attention to career and social issues. This of course is to be applauded.

Having an understanding of our athletes' learning styles is an extremely useful tool, but it has over the past few years been limited to pigeon-holing a person as a purely visual, audio or kinaesthetic learner. We actually learn in all three modalities constantly with some more prevalent at any one time.

I am sure that there have been innumerable occasions where you have realised the benefits of trusting your intuition. Like me you have probably also found ignoring intuition can come at a cost.

The field of NLP offers many ways to ensure enhanced communication with your athletes and ways to help them raise their levels of performance. At times what an athlete says to you and what they really mean may seem to be different. By asking questions correctly you may be able to gain information that may not have been immediately apparent – even to the athletes themselves!

I have found great benefit in understanding and using the principles offered by NLP in my coaching of both highly talented athletes and others who are less talented.

There are two tools I would like to offer to both assist you as coaches and also enable you to teach these tools to your athletes for their benefit.

Circle of Excellence

All exceptional performances occur when the athlete is in the right mental and emotional “state” or “zone”. While achieving this state seems to be a fleeting occurrence it is certainly possible to reproduce the state reasonably closely at will. There are two aspects to this technique. The first is to recall the sensations of a high performance state and the second is to set up ‘anchors’ so that this high performance state can be automatically reproduced.

Step 1

Imagine a circle surrounding the area in which you are going to perform. For a golfer this would be an area around the golf ball of sufficient size so that you could stand inside it comfortably. For a participant in a field sport it could include the entire field.

To be continued in the next Golfmed.net Newsletter....

3. Awareness... Mindful insights for reaching your Potential

By Pia Nilsson and Lynn Marriott
news@coaching for the future.com

Theme: I

The dictionary says: Aware implies knowledge gained through one's own perceptions or by means of information.

Synonyms: alertness, aliveness, appreciation, apprehension, attention, attentiveness, consciousness, enlightenment, experience, familiarity, information, keenness, mindfulness, perception, realization, recognition, sensibility, understanding

Our newest **GOLF54** program is about awareness & balance.

One theory of learning is called McGregor X and Y. Douglas McGregor, an American social psychologist, proposed his famous X-Y theory in his 1960 book, "The Human Side of Enterprise."

Theory X and theory Y are still referred to commonly in the field of management and motivation. "X" means that you as a teacher/coach/leader need to give the students the information and knowledge. Theory "Y" suggests that people are motivated to obtain mastery over their world and to experience feelings of self-respect, self-fulfillment and self-actualization in addition to their search for external gratification.

Theory “Y” assumptions include:

- The expenditure of physical and mental effort in work is as natural as play and rest.
- People will exercise self-direction and control towards achieving objectives they are committed to.
- People want to achieve.
- People learn to accept and seek responsibility.
- People have the capacity to exercise a high degree of imagination, ingenuity and creativity.

This belief is founded upon that students/players already have an unlimited amount of abilities and potential. The coach/teacher/leader is there as a catalyst to facilitate the discovery of these abilities. At **Coaching for the future**, we believe in doing as much of “Y” as possible. We want the players we coach to be self-directed and become their own best coaches. It seems the best way to go since most of us usually have ourselves with us!

This is where awareness comes in.

All learning begins with awareness. All growth is first about awareness of oneself (physically, mentally and emotionally), the golf club, the golf ball, the course and the game.

Awareness really begins with honesty. Honesty is required if we want to attain balance and peak performance. This is one of Annika Sorenstam's great assets. She is more honest and aware than just about any other player we have been around. She is aware of her body, thoughts and emotions. She catches herself sooner than most players when something is different than it needs to be for peak performance. On top of that, Annika has found her own unique tools to manage herself from that awareness. From that position she can create her own best game.

We know that every day in life and on the golf course is going to be different. This change is internal as well as external. Things are always changing in our bodies, mind, and emotions. The conditions around us are constantly changing... the weather, the golf course, and other people. The only constant is change. Often we hear from students that they would like to be more consistent. If you really want to develop consistency it first begins with being fully aware.

How aware can we be from day to day from moment to moment?

Awareness begins with being honest with where you are at the moment and then taking responsibility for making the changes that are required. Then it's possible to make the necessary choices to be as good as we can be from day to day.

You are the one holding the golf club, affecting the contact with the ball and experiencing your thoughts and emotions. With increased awareness you are better equipped to coach yourself with all of the elements of the game. To be aware we need to be in the present moment.

If a student isn't aware of what he or she is doing, it doesn't matter how much the coach/teacher/leader knows. Have you ever stopped to consider how much time in your day you're fully present?

There's an old Zen teaching story that speaks to this. The master is asked by the student, "How do you put enlightenment into action? How do you practice it in everyday life?" "I put enlightenment into action," replied the master, "by eating and sleeping." "But everyone sleeps and everyone eats," replied the student. "Quite so," says the master, "but it is a very rare person who really eats when they eat and sleeps when they sleep."

Real learning and change can only take place when we commit to being present with full awareness. The cultivation of awareness and balance is a lifelong process. If you practice awareness you will be surprised at your ability to change, radically and dramatically.

“Mindfulness is the practice of aiming your attention, moment to moment, in the direction of your purpose. It is called mindfulness because you have to keep your purpose in mind as you watch your attention. Then whenever you notice that your aim has drifted off, you calmly realign it.”

4. Respect your body like your Car!

By David Darbyshire

Physical Preparation Coach, Victorian Institute of Sport

Are you and your car similar? When it comes to performance you are more than you realise!

The human body can best be viewed as a “motor vehicle”, a means of transportation. Imagining the body as a motor vehicle allows you to understand it in simple terms. Most people understand the role and importance of their own car; therefore, it is easy to understand the association that the motor vehicle has with human performance.

Let us take a brief look at the basic comparisons of the human body and the motor vehicle. Firstly, both have a strong protective shell containing internal parts or organs that are highly sophisticated. Secondly, they require regular service or treatment to maintain their smooth running. Thirdly, they are susceptible to “breaking down” at any point in time. Additionally, each form of transport requires the correct fuel to use as an energy source. Finally all parts of the human body and motorcar should be well aligned to enhance movement performance.

The alignment of the wheels on the motor vehicle, and the alignment of certain body parts will have a direct effect on their respective performances. When all four wheels are aligned together, we know the car will travel in the direction it is required. What happens when one wheel is “out” of alignment?

In all cases another part of the car will compensate for the misalignment. Eg. The steering wheel will be held in a different position to where it should normally rest. This is very similar to the human body. If one part of the body is out of alignment (could be one of a thousand different scenarios) then other parts of the body will compensate accordingly. This will result in placing more stress on the entire human body. Consequently, ask yourself what would happen to your golf swing, if your body were not in true alignment?

The motor vehicle contains highly sophisticated parts that are asked to perform the same task every time it leaves the driveway. Through constant “wear and tear” those parts become more susceptible to break down. The human body is no different, just a little more complex. If the human body repeats a movement pattern i.e. the golf swing, the body will adapt accordingly. The muscles that are shortening or lengthening to during that movement pattern will want to stay in those positions...

Therefore, the body is no longer in perfect alignment, increasing the risk for body parts to break down. To try and combat the adaptations of a repetitive golf swing and decrease the risk of injury, what alternate training methods can be introduced into your training program?

Regular check-ups and services are important in maintaining the quality of your motor vehicle. Without these regular services, the motor and other parts of the car are again susceptible to breakdown. This approach to servicing should be directed to your body. As we have discussed, the golf swing is repetitious, thus it has a greater risk to injury. If we constantly service our body by various means we can minimise that risk greatly. Who can you use to service your body?

Petrol, gas, diesel and food are the major fuels providing energy for movement for both forms (human body and motor vehicle) of transportation. If bad food or fuel were to be consumed what would be the ramifications? Over time the motor vehicle and the human body would never run smoothly. The internal organs or motor parts would eventually not respond.

Imagine the performance of the golfer that eats a healthy high in carbohydrate meal three hours before competition as apposed to the golfer who has a bar of chocolate in the car on the way to competition. When the correct fuel is “pumped” into the vehicle it allows all the internal parts to work effectively and efficiently. Food for thought?

If you consider all of the above comparisons, you will start to understand the similarity between your motor vehicle and your body and how to get both to perform optimally.

5. A Mental Model for Golf

By Kevin Kirk

I'd like to preface this article by saying that I have no formal training in psychology. I have, however, had the great fortune of being exposed to people who have done extensive research on the subject via seminars, books, tapes, and direct conversations. Many of these individuals have dedicated their lives to studying peak performance, motor skill learning, and sport psychology. I've had the privilege of spending time around some very high caliber golf instructors and professional golfers who are at the top of their respective fields. I have also gathered information from my experience as a learner/competitor/instructor in the game of golf. I am eternally grateful to those individuals who knowingly and unknowingly shared their knowledge information and experience with me.

The following information is not intended to be a panacea or cure-all for the mental breakdowns we experience as golfers. It does, however, attempt to present the reader with a model for a sound mental approach as it relates to golf. I hope you enjoy it.

The Model — The following model is broken down into 4 zones. Each zone represents a different activity. The important thing to remember is that as a golfer moves from one activity to another, he/she needs to also shift into the mental zone that corresponds to the desired activity. Failure to do so is considered a mental error.

Zone 1 — Indoor Training — I ask you to consider that the reason people who study complex motor skills like ballet and the martial arts spend many hours a day training in front of a mirror is not because they are narcissistic. They need the visual feedback provided by the mirror to sharpen their skills and accelerate learning. I believe as golfers, we have a great deal to learn about motor skill learning from our friends in these other disciplines.

Like other motor skills, golf can be learned using our three primary learning modes: (1) Verbal (Hearing), (2) Visual (Seeing), (3) Kinesthetic (Feeling). Researchers tell us that 95% of motor skill learning is **nonverbal**. Each learner may have a learning preference, but most people's most powerful mode is visual. In Zone 1 training, we will be spending time in front of a mirror refining and rehearsing our technique. The focus will be highly technical with a special emphasis on technique/technical refinement. It is important that we begin to notice how things **look** and **feel** as we meet the desired conditions. These pictures and feels will serve as our references. These references are important for a couple of reasons:

1. Each learner will have a different visual and kinesthetic experience even when meeting similar physical conditions due to the subtle differences in our nervous systems and the vast differences in our most recent experience/memory. Basically, what all that means is, no one can tell us what a swing/position looks like or feels like. It is relative to the learner's perception. To learn, the learner must discover how the motions looks and feels from his/her perception.
2. These references (pictures/feels) are the information the brain will need and use to program the desired position/pattern of movement into a memory that can be stored, refined, and recalled at a later time.

Remember: Mirror practice is very important. It's highly mechanical and is ideal for correcting and refining our golfing skills. To make progress, we need accurate reliable feedback. In golf, mirror training is where you are going to get it.

Zone 2 — Outdoor Training — Outdoor training in golf is commonly done on the practice tee/green. Thirty percent of our work in Zone 2 will be focused on the mechanics of the skill. During this segment, we begin to take the visual and kinesthetic references developed in Zone 1 and put them into action. It is often helpful to set up a practice station using drills and training aids to guide you. The focus remains highly mechanical so it is important not to attach too much value to the resulting shot.

The remaining 70% of Zone 2 practice will be dedicated to the development of a **shot-making process**. This process is commonly referred to as a pre-shot routine. These routines may vary slightly from player to player. These shot-making routines are also one of the common threads that we notice in the fabric of all great players. In the routine, the primary focus shifts from mechanics to the target/creation of a shot. The overall focus now is to become totally committed to the task of moving the ball from one point to another. During play and competition, this task/target focus is necessary.

Remember: Spending all of your time in Zone 2 focusing on mechanics is one of the most common mental errors in golf. Golfers caught in this trap end up training themselves to think about their swing while they are swinging which may be useful in skill refinement, but very destructive in play and competition. Be mindful of the 30:70 ratio in structuring your outdoor practice. Keep in mind that in play/competition, you will not be tested on whether or not your skills are perfect. You will be tested on your ability to take the skills you possess in that moment, and use them to accomplish the task at hand: to move the ball from one point to another.

Zone 3 — Playing — By the time you get to the course, hopefully you will have developed the mental discipline to separate your mechanical work from your shot making process. The mental goal in Zone 3 is to make sure the golfer goes through the shot-making routine/process on **every shot**. This may be difficult at first, but as you gain control over your attention by moving it into the present and onto the task, you should begin to get more out of your game when you play.

Other areas that need to be investigated are strategies for course management, time management, attention management and energy management. Your noncompetitive playing (Zone 3) allow you to get these pieces organized and in place before attempting to enter the competitive arena in golf (Zone 4).

Remember: The shot making, routine/process developed in Zone 2, is the vehicle great players use to induce a mental state where peak performance can occur. Most golfers seem to haphazardly stumble in and out of this peak mental state. As you develop the mental discipline and skills to induce this state on command, you will begin to experience higher quality results when playing and more confidence in your ability to produce/perform under pressure. Once you develop the mental toughness and discipline to go through the shot-making routine/process on **every shot** in Zone 3, you will be ready to take on Zone 4.

Zone 4 — Competition — Competition is a great way to get feedback about you and your golf. Some lessons in golf can only be learned in the heat of competition, otherwise known as the moment of truth. The goal in Zone 4 is to have things in place so the golfer can maximize the use of his/her talent in competition. The work done in the First 3 Zones should be forging the necessary physical/mental skills into place and provide a great foundation for success in tournament play. Zone 4 also introduces the importance of other performance variables such as fitness, nutrition, dealing with emotional adversity/distractions and self image/perspective, to name a few.

Your experience in competition will provide you with the necessary information on any physical/mental patterns that may be blocking you from having your peak performances in competition.

Remember: To be a successful performer in competition, a golfer only needs to possess functional physical and mental skills. Your stumbling blocks in competition are the disguised lessons that hold the information/keys that will unlock your doors to progress.

Summary: I hope you find this model and information helpful. In structuring your approach to golf, be mindful of the different mental zones and make sure that as you move from one activity to another, you make the appropriate mental shift. This should allow you to begin to get the most out of each of the activities involved in golf. If you need help, contact a PGA pro or a qualified instructor.

Good luck!

6. 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
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Internet: <http://www.ausport.gov.au/nsic/>

Master class: Adam Scott.

Newton, J.

Australian golf digest (Sydney, Aust.)

ISSUE: Oct 2003 42-48

KEYWORDS: golf | Australia | biography | man | technique | evaluation
| Scott, A.

ACL-2218

Get your swing in sync.

Leadbetter, D.

Australian golf digest (Sydney, Aust.)

ISSUE: Oct 2003 56-63

KEYWORDS: golf | swing | technique | drill

"Whether you're a Howell or a hacker, the one true goal of the golf swing is to get the proper sequence of motion."

ACL-2219

4 slices & their cures.

Flick, J.

Australian golf digest (Sydney, Aust.)

ISSUE: Oct 2003 64-66;68;70-71

KEYWORDS: golf | slice | technique

ACL-2220

Simply Fred: a decade after being no.1 in the world, Fred Couples is a winner again, on and off the golf course.

Hawkins, J.

Australian golf digest (Sydney, Aust.)

ISSUE: Oct 2003 72-74;7679-80;83-85

KEYWORDS: golf | man | United States | biography | Couples, F.

ACL-2221

Partial tear of the posterior deltoid muscle in an elderly woman.

Lin, J.T.

Clinical journal of sport medicine (Hagerstown, Md.)

ISSUE: 13 2 Mar 2003 120-121

KEYWORDS: aged | exercise | therapy | woman | golf | injury | rupture | muscle | deltoid | magnetic resonance imaging | case report

Discusses the case report of a 75-year-old woman who complained of pain and swelling in her shoulder. A physical examination and MRI were performed which revealed a partial tear to the deltoid muscle. Treatment was administered with non-steroidal anti-inflammatory drugs and physical therapy.

ACL-0620

"Tiger, Tiger..."

Masin, H.L.

Coach and athletic director (Jefferson City, Mo.)

ISSUE: 72 7 Feb 2003 12

KEYWORDS: Woods, T. | golf | discrimination | racism

Discusses Tiger Woods' habit of dodging questions about social issues.

ACL-0006

Who gives a Hootie?

Masin, H.L.

Coach and athletic director (Jefferson City, Mo.)

ISSUE: 72 7 Feb 2003 12

KEYWORDS: Johnson, H. | Augusta National Golf Club | woman | gender equity | sex discrimination | golf | BURKE, M. | anecdote

Anecdotal story of an encounter between Hootie Johnson of the Augusta Golf Club and women's rights activist Martha Burke.

ACL-0008

Down but not out: Greg Norman.

James, B.

Golf Australia (Sydney, Aust.)

ISSUE: 176 Oct 2003 28-29;31-32

KEYWORDS: golf | man | Australia | biography | Norman, G.

ACK-9682

Watch and learn: 10 shark snapshots.

Golf Australia (Sydney, Aust.)

ISSUE: 176 Oct 2003 36-41;43-45

KEYWORDS: golf | swing | technique | Norman, G.

ACK-9683

Rummy on deck: Brett Rumford.

Ferris, R.

Golf Australia (Sydney, Aust.)

ISSUE: 176 Oct 2003 72-77

KEYWORDS: golf | man | Australia | biography | Rumford, B.

ACK-9684

Knowledge sources: a comparison of expert tennis and golf instructors. (Abstract)

Smith, M.A. | AAHPERD National Convention and Exposition (2003 : Philadelphia, Pennsylvania).

Research quarterly for exercise and sport (Reston, Va.)

ISSUE: 74 1 Suppl Mar 2003 A-56

KEYWORDS: tennis | golf | teacher | knowledge level | dissemination of information | comparative study

ACL-1055

Golf workshops.

Sports 'n spokes (Phoenix, Ariz.)

ISSUE: 29 3 May 2003 72-73

KEYWORDS: disabled persons | handicapped | golf | congress

Discusses the GolfAbility workshops that teach disabled people how to golf using appropriate adaptive equipment.

ACL-1222

Top banana: at the Pebble Beach Pro-Am, Bill Murray stole clothing, threw fruit -- and once again demonstrated the importance of not being earnest.

Van Sickle, G.

Sports Illustrated (Los Angeles)

ISSUE: 98 6 17 Feb 2003 19

KEYWORDS: golf | tournament | celebrity | Murray, B. | humour

Gary Van Sickle reports on Bill Murray's crowd pleasing antics and good humor at the annual Pebble Beach Pro-Am.

ACL-2068

http://sportsillustrated.cnn.com/si_online/scorecard/news/2003/02/11/sc/

Roaring back: returning from knee surgery, Tiger Woods proved he was sound by dominating the Buick Invitational.

Elliot, J.

Sports Illustrated (Los Angeles)

ISSUE: 98 8 24 Feb 2003 46-49

KEYWORDS: golf | professional | tournament | Woods, T.

Josh Elliot reports on Tiger Woods' win at the Buick Invitational.

ACL-2103

A woman among men: the world's best female golfer has labored in the obscurity of the LPGA, but that's all changed now that she's prepared to tee up with the big boys.

Bamberger, M.

Sports Illustrated (Los Angeles)

ISSUE: 98 8 24 Feb 2003 62-67

KEYWORDS: golf | Sorenstam, A. | woman | Sweden | biography | training | strategy

Michael Bamberger profiles Annika Sorenstam who is preparing for her debut on the PGA Tour. The article includes the specifications of the Colonial course.

ACL-2108

First-date advice: for PGA players, finishing behind Sorenstam will be like wearing a HILLARY FOR PRESIDENT button the rest of their lives.

Reilly, R.

Sports Illustrated (Los Angeles)

ISSUE: 98 8 24 Feb 2003 74

KEYWORDS: golf | Sorenstam, A. | woman | man

Rick Reilly advises Annika Sorenstam on her up-in-coming PGA tournament.

ACL-2115

http://sportsillustrated.cnn.com/inside_game/rick_reilly/news/2003/02/18/life_of_reilly/