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Chief Medical Officer

- Cricket Australia Injury Report 2011
- Appropriate use of diagnostic imaging in sports medicine
- Does supinator play a role in lateral elbow tendinopathy?
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## Here's to a happy and active 2012



Nello Marino is pictured with Sports Medicine Australia's newly endorsed product, the Smoothy golf buggy. For further information visit [smoothy.com.au](http://smoothy.com.au)

If you have a worthy cause or issue related to sports medicine or physical activity that you would like promoted in *Sport Health* via a promotional item, e.g. hat, t-shirt, mug, email [nello.marino@sma.org.au](mailto:nello.marino@sma.org.au)

### **SMA CEO, Nello Marino gives an insight into the program to date at this year's National Conference.**

With the summer holidays now over and everyone back into the regular routine it's interesting to reflect on how the festive season has changed over time and no longer seems to be the hiatus that I seem to recall it to be. Recognising the danger of sounding nostalgic my casual observation would suggest that people are having less time away from work, as distinct from the workplace, retail sales offers appear to be more extended and there appears to be less time for reflection on recent achievements with one year simply rolling into another.

I'm sure I'm not alone in declaring that 2011 was a big year for SMA as I'm sure it was for most SMA members. Another great Conference of Science and Medicine in Sport in Fremantle, the delivery of an IOC Team Physiotherapy Course for the Oceanic Region, re-signing of major sponsors Asics, Elastoplast, Voltaren, and the welcoming of DJO Global as a new SMA sponsor, record numbers of participants in Safer Sport courses throughout the country, JSAMS top ten ranking in its journal category, not to mention the enormous level of consultation that took place with SMA State Boards relating to the OneSMA proposal which members will have a greater exposure to over the coming months.

That being said there is little room for complacency and we anticipate the 2012 year to take on even greater proportions with the ramping up of OneSMA consultation with the broader membership, increased member engagement opportunities through professional development, and a national conference which will be of proportion not seen since the 1999 Pre-Olympic congress in Sydney. Co-incidentally the Conference will be again held in Sydney and is already starting to take shape with the confirmation of a number of keynote speakers.

You may recall that this year will incorporate three conferences under the be active 2012 banner. The Australian Conference

of Science and Medicine in Sport, The National Sports Injury Prevention Conference and the National Physical Activity Conference which will this year take on an international perspective as the International Congress on Physical Activity and Public Health, arguably the world's pre-eminent conference for physical activity practitioners, researchers and policy makers.

We expect over 1,500 delegates from Australia and the rest of the world to descend upon Sydney for what promises to be a wonderful event. As always the combination of the three conferences will provide an opportunity for interdisciplinary exchange, one of the great features of SMA conferences.

We're delighted to have Professor Karim Khan as the ASMF Fellows Refshauge Lecturer for 2012. Many would be aware of Karim's professional background as a Sports Physician, co-author of *Clinical Sports Medicine* and the current editor of the *British Journal of Sports Medicine*. I've had numerous members, particularly those with clinical backgrounds, express their delight in welcoming back Karim to Australia who was last at the SMA conference in 2005.

We are also delighted to have secured Dr Nick Cavill, from the UK. Nick is acclaimed for his leadership in policy and programs on sustainable transport and the links to physical activity.

Dr Ken Powell is a consultant epidemiologist from the USA and was an epidemiologist at the Centre for Disease Control for 25 years. His background and expertise is diverse and his career has focused heavily on the relationship between physical activity and health. Ken initiated the Center for Disease Control and Prevention's epidemiologic work in the area by leading a consolidation of the scientific literature and setting the public health research agenda as well as consulting to numerous government departments and sitting on high level public health committees.

These are just a small sample of the confirmed keynote speakers to date and we will make a number of other announcements on keynote and invited speakers very shortly. Additional details on all conference keynotes and invited speakers can be found at [sma.org.au/be-active/speakers/](http://sma.org.au/be-active/speakers/). The scientific committee are acutely conscious of the need to ensure a well balanced program, particularly following feedback from the Fremantle conference which suggested the program would benefit from a stronger clinical content and we look forward to delivering such a program.

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Nello Marino on  
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Study shows exercise can boost your income by up to 9 per cent [bit.ly/yrn79v](http://bit.ly/yrn79v) #SMAnews – January 16, 2012

Highlights of the January 2012 issue of the *Journal of Science and Medicine in Sport* are online now. Visit [jsams.org](http://jsams.org) #JSAMS – January 11, 2012

Happy New Year! SMA National Office is back to work. For all those determined to get fit this year, starting gradually is the key. – January 10, 2012

With Summer here, learn how to prepare yourself for hot weather conditions to avoid heat injuries when active [bit.ly/saMBQJ](http://bit.ly/saMBQJ) #SMAnews – December 7, 2011

All went well at weekend's course with Brisbane medicos teaching an advanced course for Olympic physios for 1st time [bit.ly/ry4qqo](http://bit.ly/ry4qqo) – November 29, 2011

Many Aussie kids are too inactive, spending more than the recommended time each day in front of a screen [bit.ly/tdNzX2](http://bit.ly/tdNzX2) #SMAnews – November 21, 2011

With the Presidents Cup on, those playing golf can get the best from their game & stay injury free with this fact sheet [bit.ly/smubbl](http://bit.ly/smubbl) – November 16, 2011

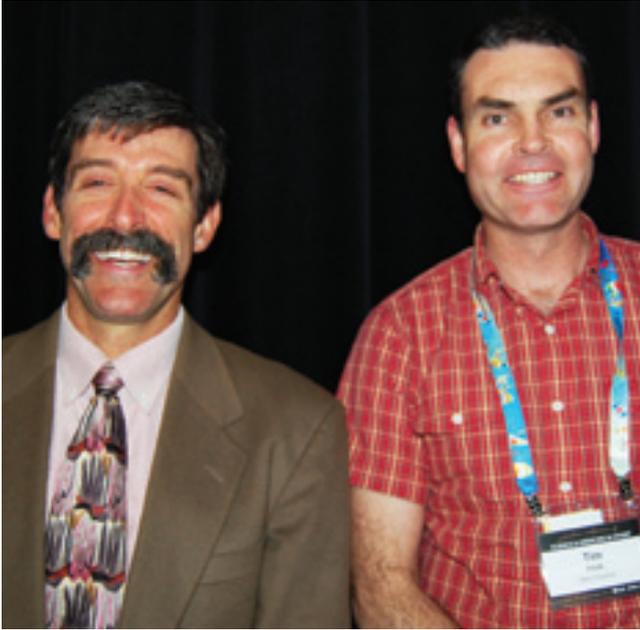
Landmark study shows that physically active primary school students perform better academically [theage.com.au/national/educa...](http://theage.com.au/national/educa...) #SMAnews – October 10, 2011

So in addition to the wonderful international line-up across all three events, be assured that the event will also feature some of the leading practitioners across all three fields represented by the three conferences, and great opportunities for cross collaboration between these fields. We look forward to seeing you in Sydney in October.

### **Nello Marino**

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## A regretful resignation



Tim Pain (right) with ACSMS 2011 keynote speaker, Mark Fenton.

**Tim Pain announces his resignation from his position as SMA National President and reflects on SMA's recent past and future.**

'You Earn at Your Fate', was once written by Gregory David Roberts. Over many years SMA has certainly earned its reputation as a leader of excellence in enhancing the health of all Australians through safe participation in sport, recreation and physical activity. Most members would see SMA operating as a professional, well oiled machine (for which most part it is) that: produces publications, conducts professional education, runs community programs, provides resource material, promotes participation in sport and physical activity, and also encourages research. This reputation does not come about by good luck, but rather by the hardwork of many of our members and management team, constantly seeking new and improved approaches to delivering on our Mission.

As the SMA National President, I have come to gain a good appreciation of just how much time some members commit so freely to SMA and our cause. This has resulted in some successful achievements in many of SMA's core areas of activity over the recent past, such as: a top-10 rating of the *Journal of Science and Medicine in Sport*; increased participation rates in the Safer Sport Program across Australia; continued attendance growth at the SMA National Conference; and greater media presence helping to increase public awareness of the importance of sport and physical activity on health.

**"...it is with some sadness that I recently resigned from the position of SMA National President..."**

Further strategies are currently being implemented and we will see more successes achieved in the areas of membership, community service, and structural efficiency, in the coming years.

Having been involved in many of these developments and having full and total awareness of the time commitment necessary to see them completed adequately, it is with some sadness that I recently resigned from the position of SMA National President with still much to be achieved. The role of President is an important one and demands a significant time commitment to fulfil all of its requirements and responsibilities. Due to a combination of both business commitments and the commitments that come from having a young family it has become increasingly difficult for me to continue to dedicate adequate time to performing the role of President at a level that is required, to do it well.

**"Michael Kenihan (Vice President) has agreed to serve in the role of presidency and as a current SMA National Executive member he is well across all of the current issues concerning SMA, ensuring that the transition will be smooth and seamless."**

Fortunately SMA is an organisation that is served well by many rather than by a few. Michael Kenihan (Vice President) has agreed to serve in the role of presidency and as a current SMA National Executive member he is well across all of the current issues concerning SMA, ensuring that the transition will be smooth and seamless. I thank him for agreeing to step into this role mid-term. He will be ably supported by the National Board and the SMA management team which continues to deliver the highest level of service to the SMA community.

One of the key functions of the National Board is to make long-term strategic decisions that will benefit all of the SMA community. In order for SMA to continue to lead and be adaptable to the challenges that exist in a modern operating environment it is imperative that we constantly seek better approaches to our practices in all key areas of activity. During my term as President one of the areas that the SMA National Board has invested a significant amount of time considering is the current structure of Sports Medicine Australia and whether the current structure will serve us best in a modern working environment or whether an alternative model would be more effective. Following an extensive review and consultation period there was a proposed improvement to the structure

of SMA. This proposed new structure has been termed 'OneSMA', and further consultation on the specifics of the proposal will be conducted in 2012. I have previously outlined the OneSMA structure to membership through several SMA publications and forums, however such an important issue should be highlighted to members as much as is practically possible before they will be asked to make a decision on the structure of SMA at the National AGM later this year.

Essentially, OneSMA proposes that the current nine structural entities (eight State Boards and the National Board) that make up SMA join to become one organisation with one governance structure and one management team to service the SMA community at both a national and local level.

**“One of the key functions of the National Board is to make long-term strategic decisions that will benefit all of the SMA community.”**

The benefits of the OneSMA model are wide and varied however the primary benefits will be that:

- SMA Members who volunteer their time to the organisation will be able to spend more of their time focusing on their area of interest and expertise rather than having to commit time to the governance and operational requirements of the nine separate entities that exist under the current federated structure.
- SMA resources will provide maximum benefit to the SMA community, rather than servicing the current governance and management structures associated with multiple organisations. This will mean that the services that we can deliver to members will be greater at a lower cost.
- Greater stability of membership service delivery with a consistent approach across Australia, whilst still allowing for local nuances due to the unique cultural differences between regional areas of Australia.

It is not unusual for organisations to alter their governance structures, as organisations grow and the environments in which they operate change. In fact this type of structural change is not unique to the requirements of Sports Medicine Australia, with many other similar organisations recently having undergone or are undergoing a similar change to the OneSMA model.

Whilst I will be taking a step back from leading this proposed change, I hope that the members will see the positive benefits associated with this, outweighing any perceived risks.

**“The benefits of the OneSMA model are wide and varied...”**

I have thoroughly enjoyed my time as National President of Sports Medicine Australia and my involvement with all associated with the organisation including members, staff, and stakeholder groups. Being National President certainly highlighted the fact that Sports Medicine Australia is a very unique organisation with a diverse range of members and also a diverse range of activities that we now undertake, however amongst all of that diversity the common theme is that of solidarity in the belief that if Australians are to be healthy then they need to be participating in sport and physical activity. And as a leading organisation we need to always seek ways to do that better.

**Tim Pain**



Michael Kenihan (left) with Professor Wendy Brown at ACSMS 2011.

## 5 mins with... Professor Peter Terry

Professor of Psychology and 2011 ASMF Fellowship recipient



### What is your profession?

University Professor and Registered Sport and Exercise Psychologist.

### How many years have you been in this profession?

I have been a university lecturer for 27 years. I originally trained as a physical education teacher in London, the city of my birth, then spent two years completing a master's degree in sport psychology at the University of Victoria in British Columbia, before returning to the UK to take my PhD in psychology at the University of Kent.

### Where do you work?

I've worked in the Faculty of Sciences at the University of Southern Queensland in Toowoomba for the past 11 years, having previously spent 16 years at Brunel University in England. Since moving to Australia in 2000, I've also worked as a consultant for the Queensland Academy of Sport and a variety of teams, most recently the Australian shooting team.

### What does your typical day consist of?

My working week is extremely varied. My university teaching is mostly online now, which suits my often hectic travel schedule but means that I frequently interact with students early mornings or late at night. I spend a day or two each week on research projects and try to reserve Wednesdays for writing. I usually catch up with postgraduate students and academic colleagues on Mondays and Fridays. Then I have to fit in my duties as Deputy Chair of the USQ Academic Board, President of the Asian-South Pacific Association of Sport Psychology, and consultations with clients. I've always spent my professional life in the fast lane and seem to be rather addicted to it.

### What is your favourite aspect of your job?

I love the variety and the travel. In 2011 alone, I delivered workshops to coaches in Iran and swimmers in Brazil, assisted Australian teams at world cup and world championship events in Europe, attended conferences in Taiwan, Canberra and Fremantle, and had the opportunity to work with many great research collaborators and students.

### What has been the highlight of your career?

By incredible good fortune, I've managed to attend five summer and three winter Olympic Games as a sport psychologist, so it's pretty hard to go past that. However, I'm also proud of having been elected to leadership positions of various professional organisations in Australia and overseas, and I take a bit of satisfaction from the 200-odd publications I've produced too.

### When, why and how did you become involved with SMA?

I joined SMA shortly after arriving in Australia because it seemed an obvious thing to do for anyone involved in a sports medicine discipline. I've always found SMA to be an organisation that promotes mutual respect across disciplines and facilitates lifelong learning.

### What inspired you to apply for ASMF Fellowship?

I once attended the Fellows dinner as a guest and was incredibly impressed not only by the vast collective experience and wisdom in the room but also by the spirit of collegiality that prevailed. Unlike Groucho Marx, I did want to join a club that might have me as a member.

### What are you passionate about?

I'm passionate about my family, my friends and my professional life, in that order. On occasions though, my priorities get a little mixed up and I allow work to take over.

### What's the best piece of advice anyone has ever given you?

An old English teacher of mine always impressed upon me that it's a sign of intelligence to ask questions when you don't understand something. Prior to that, I'd probably thought it was a sign of stupidity. I think that piece of advice generated my enquiring mind. I'm now constantly reminded of how little any of us really know.

### Name four people, living or not, you would invite for a dinner party and why?

I'd invite John Eales and Steve Waugh, because they epitomise everything that is great about Australian sport; actor and comedian Dudley Moore to entertain us and because he is shorter than me; and Kim Basinger, for obvious reasons. Sorry I meant to say my partner Victoria, for obvious reasons.

### Favourites

Travel destination: Brazil.

Sport to play/watch: Love them all.

Cuisine: Victoria's home cooking.

Movie: A Few Good Men.

Song: One Moment in Time.

Book: Anything by Val McDermid.

Gadget: iPhone.

Check out Professor Peter Terry's latest research on the role of music in sport on page 68.



# Your SMA MEMBERSHIP and PROFESSIONAL DEVELOPMENT

Expanding your sports medicine knowledge and your industry contacts are critical parts of building a successful and rewarding career in sports medicine.

SMA membership provides many opportunities to engage with other practitioners from a range of disciplines, build your networks, and expand your sports medicine skills and knowledge. Here are some of the upcoming SMA professional development opportunities:

## **be active 2012**

be active 2012 combines three great conferences

- The Australian Conference of Science and Medicine in Sport
- The Australian Sports Injury Prevention Conference
- The 4th International Congress on Physical Activity and Public Health, the world's premier physical activity research and promotion conference.

be active 2012 kicks off in Sydney from October 31 to November 3.

## **State conferences, seminars, workshops, and evenings**

All SMA state branches provide a diverse range of professional development and information sharing opportunities to suit the multidisciplinary nature of SMA members. All sessions are delivered by leaders in their field and provide a great opportunity to connect with a diverse range of practitioners and to share in the latest cutting edge research and clinical practice.

**View SMA MEMBER PROFESSIONAL DEVELOPMENT OPPORTUNITIES at [sma.org.au](http://sma.org.au)**



## What does perennial ryegrass have in common with pinot noir?



The South Island of New Zealand is known for its stunning scenery, but it is also becoming notorious for its stunning wines.

### **Dr J explores whether grass species matter in respect to injury, all whilst discussing the makings of a good wine.**

When I was a teenager growing up in Melbourne, my Dad was a bit of a wine buff and introduced me to the major great wine varieties of the world. In the French tradition I tasted these well before I was 18. The most fascinating were the great red wines of France and Dad taught me the difference between the Bordeaux and the Burgundy regions. The first difference I learnt was the shape of the bottles, the second was that the Bordeaux wines were made from a grape called cabernet sauvignon and the Burgundies were made from pinot noir. The third, which made the Bordeaux wines seem

the most impressive of all, was that you weren't meant to drink them straight away, or even for a few years and that they actually tasted better if they were kept on their side in a cool dark cellar for 10 or even 20 years! As an adult I learnt that Burgundy red wines were indeed pure pinot noir, but the grape information about Bordeaux wines was only partially correct, in that whilst the main grape variety was cabernet sauvignon, it was invariably mixed with others like merlot, cabernet franc and malbec. French wines generally didn't bother to include this information on the bottle with the region of Bordeaux and quality of the vineyard being considered the more important information.



Perennial ryegrass has no lateral growth and therefore it doesn't develop a 'thatch' layer that traps football studs. By contrast couch (Bermuda) grass and the other warm-season grasses tend to develop a heavy thatch layer due to stolons (lateral growth) above the soil.

**“Maybe with underground heating you could also produce a good pinot noir wine in England as well, but since it might cost a few hundred a bottle it would be unlikely to turn anyone’s head away from those produced in Burgundy.”**

As a kid I didn't get nearly as much instruction about grass varieties, but got to play cricket on a lawn in our backyard. Like the fact that many wine drinkers don't care about grape variety as long as the stuff tastes good, the vast majority of lawn or turf users only care about whether the grass looks green and is soft and lush. We take it for granted that grass is plentiful, but when we see subcontinent fielders who seem fearful diving for a catch, we forget that they may have grown up playing cricket on a dustbowl. This also might explain why they are better spin bowlers than most Aussies who grew up with grass everywhere. With the benefit of hindsight I'm sure that the lawn in my family home was a blend of many grasses (including clover) and that perennial ryegrass was one of them. There had to be a cool-season grass in the mix, as the lawn was green all winter in Melbourne, but I remember my Mum having to water the lawn everyday in summer to stop it dying, which would be typical for ryegrass. I think I actually first found out that grasses had 'types' when I visited my cousins' farm in Yarrawonga, a couple of hours further north and with a drier climate, where they had a back lawn of buffalo grass.

This is the same grass we have in our current lawn in our small backyard in Sydney and as a child I would have asked someone something like *“Why is this grass scratchy?”* compared to the one at my own home. I remember the answer being that it was *“Buffalo grass”* and maybe someone explained that the leaves were coarser and that there were hard 'runners' or stolons underneath the leaves but above the soil. My lawn at home didn't have these.

**“The winemakers have worked out the places and the ways to grow the best grapes to give outstanding bottles of pinot noir. There is a challenge for turfgrass science and sports injury prevention experts...”**

I first started to get really interested in grass varieties when I was in my early thirties. We had been doing AFL injury surveillance for enough years to work out that a player was significantly more likely to tear an ACL playing in a match in the 'northern states' compared to Victoria. The first thought was that maybe the grounds were harder because of the warmer weather up north, but after a year or two of measurement the data coming back was that, if anything, Melbourne grounds were at least as hard as those further to the north. It started to dawn on us that the grass types were different at the different venues around Australia and that maybe this could explain why ACL injuries are more likely in the north. We also observed

that there were far more ACL injuries early in the season, especially in the pre-season competition. I had grave fears in the year 2000 as the AFL season was starting a month early to accommodate the Olympics in September that year, thinking that there would be even more ACL injuries than usual. However, the opposite occurred and, in hindsight, for very interesting reasons. The entire pre-season competition in the year 2000 was played at Waverley Park, a ground which was condemned but, in the absence of cricket, was available during February 2000. Because it didn't host any cricket and, also, because it was situated in the Melbourne rainbelt, Waverley Park used an exclusively ryegrass surface whereas almost all of the other grounds had a summer base of couch (Bermuda) grass that was oversown with ryegrass in the autumn. Even matches played much earlier than usual in summer on ryegrass failed to give rise to the handful of ACL injuries we expected in the preseason competition every year.

**“In Australia we have the highest published rate of ACL injuries in the world, with Tasmania clearly having the lowest rate, followed by Victoria.”**

In the 2000s there were major trends in the Australian and world wine industry occurring. People were abandoning Chardonnay and Riesling as their preferred white varieties for Sauvignon Blanc and of the red varieties, Pinot Noir was starting to be held with the same reverence as Cabernet and Shiraz blends. The focus of wine growing in Australia was moving southwards, with the Yarra Valley, Tasmania and New Zealand starting to become the new shining lights of Antipodean wine production. In 2009 I was visiting Linköping in Sweden to give a talk, which included my research on grass varieties and ACL injury risk, to Jan Ekstrand's research group. My wife Jess and I were staying at Jan's house and he stopped off at a government-run (isn't everything in Sweden?) liquor outlet to get us a bottle of wine for dinner. He declared himself a big fan of Australian wines which the government monopoly importer was kind enough to offer Swedish citizens at a very attractive price. However, he sheepishly admitted to me that he had become an even bigger fan of New Zealand wines, although he was worried that this might sound like an outsider confessing to him that he preferred Norway over Sweden because of the superior fjörds. I actually agreed with him and also admitted that in general I thought that the New Zealand wines were blowing away many of the traditional Australian offerings, but suggested that he lean on the Swedish alcohol importer to start trying some wines from Tasmania, especially their

pinot noirs and sparkling wines. Like the gold standard sparkling wines from Champagne, the Tassie ones are usually a mix of Chardonnay and Pinot Noir grapes. White sparkling is usually pinot noir with the skins peeled off whereas in pink sparkling, which is even harder to do well, the skins are left on for a period of fermentation to give the wine a pinkish tinge. The Blanc de Blancs variety of sparkling wine (Chardonnay only without the pinot noir) is easier to grow in many regions of the world, as the Chardonnay grape is very agreeable to most temperate climates around the world. Chardonnays grown in a warmer drier climate like Margaret River can be outstanding but with a different character to the cooler more humid climates like Burgundy in France (or New Zealand). In the movie *Sideways*, the main character Miles Raymond, who is a shocking wine buff, stated famously that he refused to drink Merlot but loved pinot noir, partly because the grape was so thin-skinned and fussy (fitting in with the character's own personality). The fussiness meant that whilst it could be grown in less than ideal climates, it was highly prone to disease and poor output, but in a cool-cold temperate climate with year-round high rainfall and humidity and a long but medium warm summer, it produced a flavour that perhaps was better – in some subjective opinions – than all other wine varieties. The outstanding climate in Europe is of course the northern Burgundy region of France, but elsewhere there are climates which mimic these ideal characteristics, with the small islands of Tasmania and the south island of New Zealand perhaps being equally ideal. Because of the fussiness of the grape, no good bottles of pinot noir (nor sparkling wine) are cheap, but world experts are starting to feel there is better value to be had in Tasmanian and New Zealand pinots as their iconic status hasn't yet reached that of Burgundy, even though the quality actually may have.

**“Most groundsmen who manage a football playing surface of natural grass are not working to the key performance indicator of trying to prevent players from tearing ACLs, but instead are trying to make the surface as green, soft and lush as possible.”**

Perennial ryegrass is thought of as an English grass, but it grows in many countries of the world and ironically, it is probably the climatic conditions I have just described with respect to pinot noir that ryegrass is most suited to. Although almost all EPL grounds use perennial ryegrass as the primary species, the fact that they almost all use underground heating to keep it alive and able to withstand

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Central Otago pinot noir is the closest rival to the traditional great wines of Burgundy. Some of the Bay of Fires sparklings from northern Tasmania cost as much as a bottle of non-vintage Moët, but there are many wine experts who will tell you that it represents better value for money.

the traumas of a football match in winter, suggests that the English winter is not in fact the ideal growing conditions for this grass. Maybe with underground heating you could also produce a good pinot noir wine in England as well, but since it might cost a few hundred a bottle it would be unlikely to turn anyone's head away from those produced in Burgundy.

**“Like the fact that many wine drinkers don’t care about grape variety as long as the stuff tastes good, the vast majority of lawn or turf users only care about whether the grass looks green and is soft and lush.”**

Most groundsmen who manage a football playing surface of natural grass are not working to the key performance indicator of trying to prevent players from tearing ACLs, but instead are trying to make the surface as green, soft and lush as possible. It turns out that if you are doing this in Tasmania or the south island of New Zealand or in central France, the grass you should be using is perennial ryegrass, without any blend of other grass species at all as the rye will grow so well. If you are looking after a ground in a slightly warmer climate, then a couch (Bermuda) base in summer, plus a rye oversow in winter as it gets cooler, is probably the preferred combination. In a really warm climate (e.g. north Queensland), you might use couch grass and not need to oversow it with ryegrass at all. As the weather gets colder, underground heating is needed in winter

to keep the grass alive. If the climate is humid (wet) ryegrass might still be the best option, but if it is drier then Kentucky Bluegrass is preferable and often it is best to mix these two grasses together.

Does grass species matter with respect to injury? In my opinion the answer with respect to ACL injury is definitely yes, although it is hard to prove due to all of the confounders involved in the genesis of an ACL injury.

**“I... also admitted that in general I thought that the New Zealand wines were blowing away many of the traditional Australian offerings...”**

The strongest evidence is the raw epidemiological data and it gets stronger when you add a few close up pictures of the different types of grass, showing that ryegrass leads to a lot less grip than the warm-season grasses (and even Kentucky Bluegrass). In Australia we have the highest published rate of ACL injuries in the world, with Tasmania clearly having the lowest rate, followed by Victoria. The AFL ACL data map follows the same trend as the general population. New Zealand, France and England, all of which tend to have ryegrass on their football grounds, have far lower rates of ACL injury than Australia. In Europe, southern Europe, with a Mediterranean climate that uses warm-season grasses as a base, the rate of ACL injuries is double that of northern Europe, where ryegrass



is the preferred grass. In the USA, where Kentucky Bluegrass is used a lot more because of the colder drier winters, there doesn't seem to be a north-south bias for ACL injuries.

**“It started to dawn on us that the grass types were different at the different venues around Australia and that maybe this could explain why ACL injuries are more likely in the north.”**

The fascinating conclusion I have come to with respect to climate is that where pinot noir grapes thrive, perennial ryegrass thrives,

and ACL injury rates tend to be lower. The winemakers have worked out the places and the ways to grow the best grapes to give outstanding bottles of pinot noir. There is a challenge for turfgrass science and sports injury prevention experts to get together and try to replicate the low ACL risk characteristics of cool-climate ryegrass surfaces around the world and try to eliminate the plague of ACL injuries that is seen in places like mainland Australia.

**Dr J**

The opinions expressed in Dr J are the personal opinions of the author.



Grapes and vines in the Chateauneuf du Pape region of southern France, which climate-wise is more similar to the Barossa region in South Australia. Syrah (shiraz) is preferred here to Pinot Noir due to the warmer Mediterranean weather.

## Injury Report 2011: Cricket Australia



Cricket Australia conducts an annual ongoing injury survey recording injuries in contracted first class players (male). This report analyses injuries (defined as any injury or other medical condition that either: prevents a player from being fully available for selection in a major match; or during a major match, causes a player to be unable to bat, bowl or keep wicket when required by either the rules or the team's captain) occurring prospectively at the state and national levels over the last decade, commencing in the 1998–99 season concluding in the 2010–11 season.

### Notable findings

- A continuation of the long-term trends of similar injury incidence to the previous decade but steadily *increasing injury prevalence* were demonstrated.
- An entrenched feature of the cricket calendar is now greater variability in the type of cricket played and rapid transit back and forth between the various forms.
- Most injury categories have stayed relatively constant in prevalence (i.e. those which have increased in 2010–11 did so only marginally).
- The Australian team suffered ongoing high injury prevalence in 2010–11 of 15.5 per cent of players being injured, with the primary culprits being increasing absolute match schedule and workload, increasing workload variability (due to a rise in T20 cricket with no decline in Test cricket) and, to a lesser extent, a greater reliance on pace bowling (compared to spin bowling) in the Australian team. The first two factors (increased scheduling and variability) are now probably entrenched permanently and to combat will probably require paradigm shifts in rules of the game, player specialisation and player selection.
- The AMS (Athlete Management System) was used extensively by doctors and physios from all states again in season 2010–11, more so than in previous seasons.

## Results

### Injury exposure calculations

Since 1998–99 the Australian team has contracted 25 players annually prior to the start of any winter tours. The Australian squad for each subsequent season has been greater than 25 players, as it includes (from the date of their first match until the new round of contracts) any other player who tours with or

plays in the Australian team. State teams can contract up to 20 other players on regular contracts (outside their Australian contracted players) and up to 5 players on ‘rookie’ contracts. As with the Australian team, any other player who plays with the team in a major match during the season is designated as a squad member from that time on. To date, players who have been contracted to play Twenty–20 matches only for a state have been included as regular players according to the international definition.

**Table 1 – Squad numbers per season**

Squad	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
Australia	30	28	31	28	30	31	28	40	40	40
New South Wales	35	31	28	27	37	40	35	38	38	38
Queensland	28	27	30	30	31	32	32	33	28	32
South Australia	27	32	22	30	26	27	30	29	28	31
Tasmania	28	26	24	22	27	32	29	27	28	30
Victoria	31	31	29	27	36	31	25	26	32	33
Western Australia	30	29	30	30	37	34	32	34	32	35

**Table 2 – Team matches under survey from 2000–01 to 2009–10**

	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
Champions League T20									11	9
Domestic First Class	62	62	62	62	62	62	62	62	62	62
Domestic One Day	62	62	62	62	62	62	62	62	62	62
Domestic T20					14	26	32	34	34	40
International T20				1	3	1	11	6	10	12
One Day International	22	39	25	26	35	36	20	23	39	29
Test match	14	12	11	14	17	5	6	15	13	9
<b>All matches</b>	<b>160</b>	<b>175</b>	<b>160</b>	<b>165</b>	<b>193</b>	<b>192</b>	<b>193</b>	<b>202</b>	<b>231</b>	<b>223</b>

Table 2 shows that the number of matches under survey reached its highest level in season 2009–10, with 2010–11 being the second highest season. The format of the Sheffield Shield since 1998–99 has consistently been that each of 6 teams plays 10 matches each, one home and one away against each of the other teams (60 team matches), followed by a final (2 team matches) at the end of the season. The matches are all scheduled for 4 days, with the final being scheduled for 5 days. The major change in Shield scheduling in recent seasons has been to compact the match schedule (particularly prior to Christmas) to allow for a discrete ‘window’ for the Big Bash tournament. The average number of days between Shield games has therefore decreased (see Table 15).

Since 2000–01, the domestic limited overs (one day) competition has followed the same home and away format as the Sheffield Shield (although it will reduce for season 2011–12). The domestic T20 competition (currently the KFC Big Bash) commenced in season 2005–06 as a limited round of matches but has been expanded in each subsequent season. Season 2009–10 included a further expansion to the calendar as Champions League Twenty–20 matches were played for two Australian state teams. As seen from Table 3, in limited overs matches, the number of team days is generally the same as the number of team matches scheduled, with the exception of washed out games which count as zero days of exposure.

**Table 3 – Team days played under survey 2000–01 to 2009–10**

	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
Champions League T20									11	9
Domestic T20					14	24	30	34	34	40
Domestic One Day	62	62	62	60	60	62	60	62	62	62
Domestic First Class	228	220	242	234	228	232	236	234	240	228
International T20				1	3	1	11	6	10	12
One Day International	21	39	25	24	35	36	20	23	39	27
Test match	61	51	50	58	78	22	28	72	58	41
<b>Total</b>	<b>372</b>	<b>372</b>	<b>379</b>	<b>377</b>	<b>418</b>	<b>377</b>	<b>385</b>	<b>431</b>	<b>454</b>	<b>419</b>

**Table 4 – Overs bowled in matches each season**

	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	10 Year Average
Champions League T20									210	175	192
Domestic T20					241	470	570	659	615	730	547
Domestic One Day	2,835	2,697	2,883	2,729	2,751	2,877	2,606	2,751	2,846	2,546	2,752
Domestic First Class	9,833	9,224	10,311	9,871	9,645	9,967	9,713	9,974	9,745	9,297	9,758
International T20				20	58	20	171	121	152	224	110
One Day International	980	1,700	1,094	1,057	1,577	1,488	805	959	1,657	1,226	1,254
Test match	2,243	2,073	2,000	2,159	2,756	890	1,136	2,833	2,116	1,419	1,962
<b>Total</b>	<b>15,891</b>	<b>15,694</b>	<b>16,288</b>	<b>15,835</b>	<b>17,027</b>	<b>15,711</b>	<b>15,001</b>	<b>17,299</b>	<b>17,341</b>	<b>15,617</b>	<b>16,170</b>

As per the international definitions<sup>10-13</sup>, hours of player exposure in matches is calculated by multiplying the number of team days of exposure by 6.5 for the average number of players on the field and then multiplied by the number of designated hours in a day's play. However, as envisaged in last year's report and subsequent publication<sup>21</sup>, this report will use a new unit of match injuries (per 1,000 days of play, Table 3) which more fairly compares T20 cricket to other forms of the game. This is used as the denominator for Table 6 in the injury incidence section.

Table 4 shows that workload in terms of number of overs bowled has stayed fairly steady in first class domestic cricket over the past 10 years. The overall number of overs bowled reached an all-time high in season 2009–10, but fell back during 2010–11 as there were more shortened matches in the Domestic first class season and fewer Test matches. T20 cricket itself has not substantially increased overall bowling workload. However, two 'knock-on' effects of T20 cricket have probably been highly significant (but are somewhat hard to measure) – increased variability in workloads and increased compression of first class fixtures to accommodate the T20 calendar (Table 15).



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**Table 5 – Player days of exposure available<sup>1</sup>**

	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
Champions League T20									361	234
Domestic T20					441	739	887	1,021	1,029	1,263
Domestic One Day	1,739	1,675	1,651	1,564	1,842	1,911	1,755	1,843	1,824	1,817
Domestic First Class	6,435	5,936	6,477	6,157	7,193	7,265	6,981	7,008	7,131	6,918
International T20				27	82	27	227	199	335	361
One Day International	608	1,061	685	640	960	1,056	536	743	1,302	984
Test match	1,707	1,352	1,374	1,562	2,095	572	736	2,169	1,933	1,419
<b>Total</b>	<b>10,489</b>	<b>10,024</b>	<b>10,187</b>	<b>9,950</b>	<b>12,613</b>	<b>11,570</b>	<b>11,122</b>	<b>12,983</b>	<b>13,915</b>	<b>12,996</b>

Player days per team per season are calculated by multiplying the size of the squads (for each match) by the number of days for matches (Table 5).

### Injury incidence

Injury incidence results are detailed in Table 6–Table 10. Injury match incidence is calculated in Table 6 using the total number of injuries (both new and recurrent) as the numerator and the number of days of play (Table 3) as the denominator. Injury match incidence is probably a flawed way to examine injury risk, because the genesis of fast bowling injuries is often prior workload patterns<sup>20</sup>. For example, in 2009–10, there were reportedly no bowling injuries from the Champions T20 League. However, the two teams involved (NSW and VIC), which needed to return to start first class cricket immediately, suffered a high prevalence of fast bowler injuries for the season, perhaps due to having the most compressed season(s) and unorthodox lead-in

(a T20 tournament rather than the traditional two and three day practice matches). In a similar fashion, the home summer ODI competition traditionally has the highest injury rate of the Australian calendar, yet we now understand that the reason for this is fatigue from the prior Test matches in the lead up to the ODI schedule. One day cricket played over an extended period (e.g. in World Cups) generally leads to fewer injuries than Test cricket.

Table 6 analyses match injury incidence by a new unit, injuries per 1,000 days of play. These units were not recommended by the international definitions, but enable a more direct comparison between T20 cricket and the other forms. From this, it can be seen that Domestic T20 matches have a similar bowling injury incidence than other forms of domestic cricket in terms of injuries per day of play as well as injuries per 1,000 overs bowled. The international and Champions League T20 figures follow a similar trend although are not yet as accurate due to the small sample size.

**Table 6 – Injury match incidence (new and recurrent injuries/1,000 days of play)**

	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	10 year average
Champions League T20									0.0	222.2	100.0
Domestic T20					71.4	208.3	200.0	117.6	117.6	400.0	204.5
Domestic One Day	96.8	161.3	290.3	183.3	283.3	209.7	233.3	306.5	451.6	322.6	254.1
Domestic First Class	175.4	95.5	90.9	94.0	57.0	112.1	156.8	149.6	95.8	149.1	117.6
International T20 *				0.0	3,333.3	0.0	5,555.6	0.0	100.0	166.7	214.3
One Day International	142.9	359.0	160.0	291.7	85.7	222.2	200.0	173.9	256.4	370.4	231.8
Test match	114.8	58.8	240.0	34.5	89.7	90.9	142.9	83.3	51.7	122.0	98.3
<b>All matches</b>	<b>150.5</b>	<b>129.0</b>	<b>147.8</b>	<b>111.4</b>	<b>100.5</b>	<b>143.2</b>	<b>182.8</b>	<b>157.8</b>	<b>152.0</b>	<b>207.6</b>	<b>148.7</b>

\* Sample size for International T20 each year is very small hence wildly varying results.

**Table 7 – Bowling match incidence (new and recurrent match injuries/1,000 overs bowled)**

	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	Average
Champions League T20									0.0	11.4	5.2
Domestic T20					0.0	2.1	1.8	3.0	0.0	6.9	2.7
Domestic One Day	1.1	1.9	2.1	1.5	1.1	1.4	2.7	3.6	3.9	4.3	2.3
Domestic First Class	1.5	1.5	0.9	1.0	0.2	1.1	2.2	2.3	1.2	2.3	1.4
International T20				0.0	0.0	0.0	5.8	0.0	6.6	4.5	3.9
One Day International	0.0	1.8	0.0	1.9	0.6	2.0	0.0	1.0	3.6	4.1	1.7
Test match	1.8	1.4	3.5	0.0	0.7	1.1	0.0	0.7	0.5	1.4	1.1
<b>All matches</b>	<b>1.4</b>	<b>1.6</b>	<b>1.4</b>	<b>1.0</b>	<b>0.5</b>	<b>1.3</b>	<b>2.0</b>	<b>2.2</b>	<b>1.8</b>	<b>2.9</b>	<b>1.6</b>

**Table 8 – Injury seasonal incidence by team (injuries/team/season)**

	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	10 year average
Australia	15.5	29.3	14.0	14.8	16.2	26.2	25.0	14.9	13.4	21.7	18.8
New South Wales	18.5	10.2	18.8	5.8	8.9	15.0	9.2	20.8	19.3	22.7	14.9
Queensland	25.3	15.7	20.4	17.9	15.0	20.6	36.3	19.1	8.6	26.3	20.5
South Australia	17.6	19.0	18.8	9.7	17.3	12.7	17.5	17.4	20.3	20.7	17.1
Tasmania	16.9	20.5	13.2	19.7	21.7	14.8	11.6	11.8	16.9	12.0	15.9
Victoria	20.5	21.1	17.7	13.4	15.9	20.4	29.0	20.5	17.8	15.4	19.2
Western Australia	16.6	21.0	14.2	23.6	11.9	12.4	16.3	17.0	6.6	23.1	16.3
<b>All teams</b>	<b>18.3</b>	<b>19.8</b>	<b>16.4</b>	<b>15.0</b>	<b>15.1</b>	<b>17.4</b>	<b>20.2</b>	<b>17.3</b>	<b>14.8</b>	<b>20.4</b>	<b>17.5</b>

**Table 9 – Injury seasonal recurrence rates (recurrent injuries/all injuries)**

	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	Average
Recurrence rates	8.5%	7.3%	10.0%	3.0%	7.1%	8.9%	17.3%	15.8%	7.6%	12.4%	9.0%



Seasonal incidence (Table 8 and Table 10) is calculated by the number of injuries multiplied by 1,500 (for a squad of 25 players over 60 days), divided by the number of player days of exposure (Table 5). This has reached a new peak in 2010-11 but, unlike prevalence, this may reflect year to year bounce as there is not a gradual upward trend over seasons.

Table 9 reveals that the injury recurrence rates stabilised in 2009-10 after increasing over the prior two seasons.

Table 10 reveals that seasonal incidence by body part has generally been consistent over the past eight seasons. Some injury categories have fallen slightly in incidence in recent seasons including shoulder tendon injuries and wrist and hand fractures although most categories have stayed fairly constant.



**Table 10 – Injury seasonal incidence by body area and injury type**

Injury type	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
Fractured facial bones	0.3	0.0	0.1	0.2	0.2	0.1	0.1	0.3	0.1	0.1
Other head and facial injuries	1.0	0.2	0.1	0.2	0.1	0.3	0.1	0.1	0.0	0.1
Neck injuries	0.0	0.0	0.0	0.0	0.2	0.4	0.0	0.0	0.0	0.1
Shoulder tendon injuries	0.9	1.1	0.0	0.2	0.9	0.6	0.5	0.2	0.3	0.3
Other shoulder injuries	0.7	0.3	0.4	0.9	0.8	0.5	1.5	0.3	0.3	0.3
Arm/forearm fractures	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0
Other elbow/arm injuries	0.0	1.1	0.1	0.2	0.6	0.3	0.9	0.3	0.2	0.7
Wrist and hand fractures	1.7	1.1	1.0	1.2	0.8	0.5	1.3	0.9	1.3	2.5
Other wrist/hand injuries	0.1	0.6	0.7	1.2	0.4	0.5	0.4	0.9	0.6	1.3
Side and abdominal strains	1.8	0.5	1.1	1.4	0.6	1.7	1.7	1.4	1.8	1.2
Other trunk injuries	0.4	0.2	0.4	0.0	0.6	0.6	0.1	0.1	0.3	0.3
Lumbar stress fractures	0.7	1.4	0.8	0.2	0.4	1.0	0.3	0.6	0.6	1.2
Other lumbar injuries	0.9	2.1	1.8	1.1	1.7	1.0	1.6	1.2	1.1	1.7
Groin and hip injuries	0.9	3.2	1.4	0.8	1.2	1.6	1.1	0.9	0.6	1.6
Thigh and hamstring strains	2.6	1.9	2.9	2.6	1.3	2.1	4.4	4.8	2.9	2.5
Buttock and other thigh injuries	0.1	0.2	0.7	0.0	0.0	0.8	0.5	0.4	0.4	0.5
Knee cartilage injuries	1.4	0.6	0.4	0.9	1.8	0.9	0.7	0.4	1.2	0.8
Other knee injuries	0.6	0.5	0.3	0.0	0.6	0.4	0.3	0.3	0.5	0.2
Shin and foot stress fractures	0.3	0.8	0.3	0.6	0.1	0.5	0.5	0.9	0.1	0.6
Ankle and foot sprains	1.1	1.0	1.6	0.8	0.5	1.0	1.2	1.1	0.4	1.2
Other shin, foot and ankle injuries	2.0	1.8	1.6	1.8	0.6	1.4	1.3	1.2	0.9	2.4
Heat-related illness	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Medical illness	0.9	1.1	0.5	1.1	1.5	1.2	1.3	0.3	0.2	0.7
<b>Total</b>	<b>18.3</b>	<b>19.8</b>	<b>16.4</b>	<b>15.0</b>	<b>15.1</b>	<b>17.4</b>	<b>20.2</b>	<b>16.8</b>	<b>14.1</b>	<b>20.4</b>



### Injury prevalence

Injury prevalence rates follow a similar pattern to injury incidence, but although incidence has stayed constant over the past few seasons, prevalence has gradually increased. The disparity between the two can be partially attributed to the increased number of matches, with the 'average' injury artificially becoming more severe over recent years because there are more matches to miss (injury prevalence = injury incidence x average injury severity). Injury prevalence rates (Table 11–Table 13) in season 2009–10 were slightly higher

than the long-term average, which is an expected outcome given the steadily increasing amount of match exposure at domestic level. The Australian team had a prevalence rate that was higher in 2010–11 than in any previous seasons.

Pace bowlers remain the position most susceptible to missing time through injury (Table 12). In season 2009–10, 24 per cent of fast bowlers were missing (on average) through injury at any given time. It continues to be a priority to further research possible risk factors for pace bowlers in order to control their injury rates.

**Table 11 – Comparison of injury prevalence between teams**

	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	Average
Australia	6.7%	8.1%	11.8%	5.6%	7.7%	10.0%	11.0%	15.8%	15.5%	18.2%	11.0%
New South Wales	5.4%	6.7%	15.1%	3.1%	5.7%	5.8%	6.4%	8.1%	17.7%	20.3%	9.4%
Queensland	16.6%	8.8%	14.5%	15.1%	7.3%	12.3%	18.5%	12.0%	8.8%	19.9%	13.4%
South Australia	14.5%	9.4%	10.1%	2.1%	9.0%	7.9%	4.9%	9.2%	15.6%	11.0%	9.4%
Tasmania	8.8%	8.7%	3.3%	12.1%	21.7%	9.4%	9.5%	9.6%	10.8%	8.9%	10.3%
Victoria	12.6%	9.9%	13.7%	7.5%	11.7%	18.1%	19.6%	9.9%	12.7%	11.6%	12.7%
Western Australia	6.9%	10.5%	9.1%	11.9%	9.2%	9.6%	11.1%	8.7%	3.3%	18.8%	9.9%
<b>Average</b>	9.7%	8.7%	11.4%	8.1%	9.7%	10.3%	11.4%	11.1%	12.8%	15.9%	10.9%

**Table 12 – Injury prevalence by player position**

	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11	Average
Batsman	4.7%	3.9%	6.7%	9.8%	6.3%	5.5%	7.7%	6.6%	6.8%	10.2%	6.9%
Keeper	0.6%	0.8%	3.9%	3.2%	2.9%	0.5%	1.7%	3.0%	8.6%	8.2%	3.6%
Pace Bowler	19.4%	16.5%	18.2%	9.3%	14.4%	18.6%	19.1%	17.9%	21.5%	24.9%	18.2%
Spinner	1.1%	3.6%	7.1%	4.2%	8.8%	4.1%	10.7%	5.3%	4.6%	10.8%	5.9%

**Table 13 – Comparison of injury prevalence by body area**

Body region	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
Fractured facial bones	0.2%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.2%	0.1%	0.0%
Other head and facial injuries	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Neck injuries	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
Shoulder tendon injuries	1.4%	0.6%	0.1%	0.1%	0.8%	0.7%	0.4%	0.5%	0.5%	0.0%
Other shoulder injuries	0.6%	0.1%	0.5%	0.8%	1.0%	0.5%	1.1%	0.2%	0.3%	0.5%
Arm/forearm fractures	0.0%	0.0%	0.0%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%
Other elbow/arm injuries	0.0%	0.5%	0.0%	0.1%	0.2%	0.0%	0.4%	0.6%	0.7%	0.6%
Wrist and hand fractures	0.9%	0.6%	0.8%	0.7%	0.6%	0.2%	0.5%	0.2%	0.8%	1.4%
Other wrist/hand injuries	0.0%	0.2%	0.1%	0.7%	0.1%	0.1%	0.6%	0.1%	0.3%	0.5%
Side and abdominal strains	0.7%	0.1%	0.7%	0.8%	0.3%	0.6%	0.8%	0.8%	0.9%	1.3%
Other trunk injuries	0.1%	0.0%	0.1%	0.0%	0.3%	0.1%	0.0%	0.0%	0.9%	0.1%
Lumbar stress fractures	1.1%	1.8%	2.1%	0.2%	0.9%	1.6%	0.8%	0.8%	1.8%	2.7%
Other lumbar injuries	0.3%	0.6%	0.8%	1.0%	1.1%	0.6%	0.5%	1.3%	1.0%	1.2%
Groin and hip injuries	0.8%	0.7%	0.8%	0.3%	0.6%	1.0%	0.7%	0.4%	0.3%	1.2%
Thigh and hamstring strains	0.7%	0.8%	0.7%	0.7%	0.3%	1.1%	1.6%	1.8%	1.5%	1.1%
Buttock and other thigh injuries	0.0%	0.0%	0.4%	0.0%	0.0%	0.8%	0.1%	0.4%	0.1%	0.1%
Knee cartilage injuries	1.2%	1.1%	0.5%	0.5%	1.7%	1.0%	0.6%	0.3%	1.3%	1.5%
Other knee injuries	0.1%	0.1%	0.2%	0.0%	0.6%	0.3%	0.4%	0.5%	1.5%	0.4%
Shin and foot stress fractures	0.2%	0.5%	0.0%	0.5%	0.2%	0.4%	0.4%	1.0%	0.2%	1.0%
Ankle and foot sprains	0.5%	0.3%	1.5%	0.2%	0.5%	0.6%	1.6%	0.5%	0.3%	0.7%
Other shin, foot and ankle injuries	0.8%	0.5%	1.4%	0.6%	0.2%	0.4%	0.5%	0.8%	0.3%	1.3%
Heat-related illness	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Medical illness	0.2%	0.2%	0.5%	0.6%	0.3%	0.2%	0.3%	0.1%	0.2%	0.3%
<b>Total</b>	<b>9.7%</b>	<b>8.7%</b>	<b>11.4%</b>	<b>8.1%</b>	<b>9.7%</b>	<b>10.3%</b>	<b>11.4%</b>	<b>10.4%</b>	<b>12.8%</b>	<b>15.9%</b>

**Changes to demographics and season schedule over time**

Table 15 attempts to illustrate one of the major scheduling effects of the development of the T20 competition and its effects on first class cricket. This table uses NSW as an example, but is almost certainly representative of all major

Australian cricket teams. It shows that the median number of days between Shield games has dropped from a high of 16 days between games in 1999–2000 to 6.5 days between games in 2010–11. Median was chosen rather than mean because there is a very high number of days break between the Shield games either side of the window for the Big Bash.

**Table 14 – Compaction of NSW Shield games by season**

Season	96–97	97–98	98–99	99–00	00–01	01–02	02–03	03–04	04–05	05–06	06–07	07–08	08–09	09–10	10–11
Median days b/w Shield games	10	15	11	16	10	10	7	10	8.5	8	8.5	9	10	8	6.5
No of games with <10 day break	4	4	4	3	3	3	6	4	5	6	5	5	4	5	8



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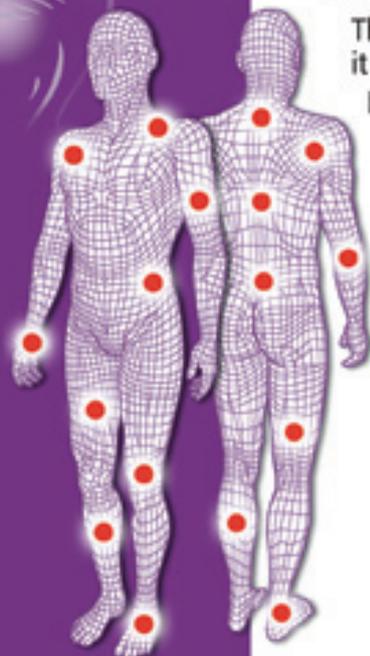
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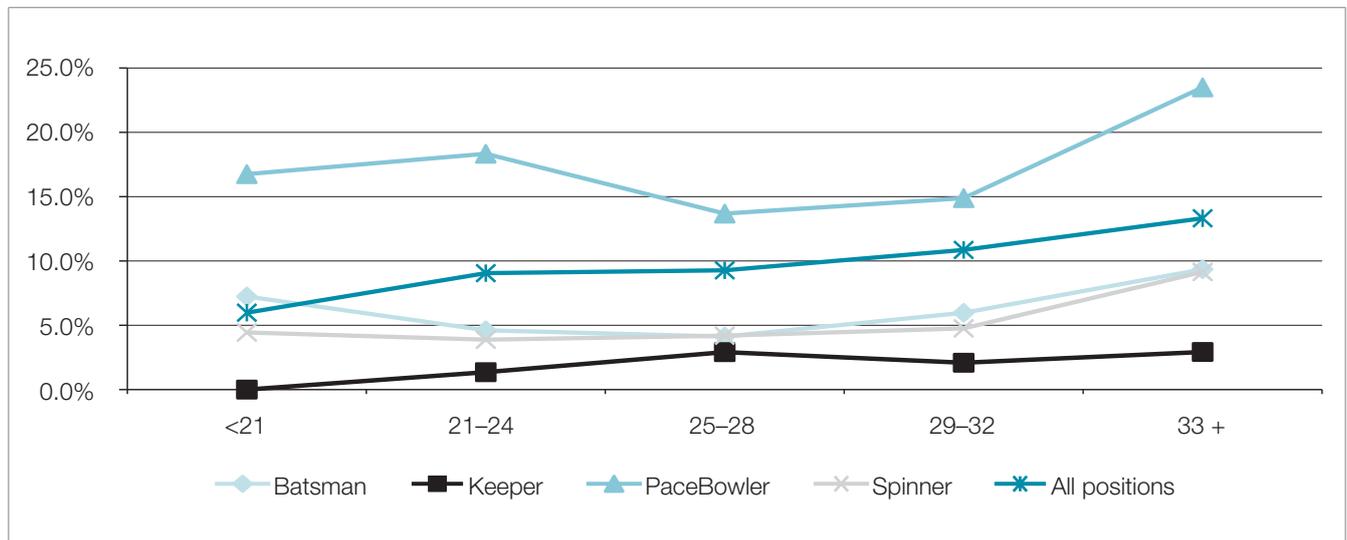


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Figure 1 – Injury prevalence by position by age in first class cricketers



Fast bowler injury prevalence is high, particularly early in their careers (due to stress fractures, Figure 1) and late in their careers (due to degenerative changes, Figure 1). The NSW squad in recent years, used again as an example in Table 16 (although perhaps an exaggerated one) has a mix of young and ageing bowlers, with few in the middle ground of late 20s which is the time when bowlers are least injury prone. As can

be seen from Table 15 in the decade from 95–96 to 04–05 there were no matches played by fast bowlers under 21 in the NSW fixtures.

From Table 16 and Figure 1 it can be seen that the demographic changes to the NSW squad, for example, have probably contributed to the NSW team having higher injury prevalence than the historical levels (Table 12).

Table 15 – Matches played by NSW pace bowlers by season (comparison of age brackets)

Age	95–96	96–97	97–98	98–99	99–00	00–01	01–02	02–03	03–04	04–05	05–06	06–07	07–08	08–09	09–10	10–11
<21											5	8	9	1	18	22
21–24	20	18	28	29	30	32	40	39	2	5	34	29	5	30	34	36
25–28	27	27	36	36	27	43	38	41	56	43	21	46	27	42	26	22
29–32	15	18	5	5	2	6	14	14	20	38	28	33	61	48	38	19
33+				6	3				1	1	3		17		17	30
<b>Total</b>	<b>62</b>	<b>63</b>	<b>69</b>	<b>76</b>	<b>62</b>	<b>81</b>	<b>92</b>	<b>94</b>	<b>79</b>	<b>87</b>	<b>91</b>	<b>116</b>	<b>119</b>	<b>121</b>	<b>133</b>	<b>129</b>

Proportion of games affected by injury to one or both teams

Table 16 – Percentage of teams in first class games suffering an injury over the past 13 seasons

	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
Matches with an injury	35	22	26	19	18	21	27	30	23	31
Matches with no injury	41	52	47	57	61	46	41	47	52	40
Percentage of games affected by injury	46.1%	29.7%	35.6%	25.0%	22.8%	31.3%	39.7%	39.0%	30.7%	43.7%

To give further evidence to the point of view that will shortly be argued regarding the necessity of substitutes in cricket, Table 17 reveals that a high percentage of matches in the past decade, but particularly in 2010–11, have been affected

by injury. The traditional viewpoint that substitutes are not necessary in cricket because the game has a low injury rate can be discounted, as 44 per cent of games in 2010–11 were affected by injury to one or both teams.

## Analysis of specific injuries

### Lumbar stress fractures

**Table 17 – Key indicators for lumbar stress fractures in the last 10 seasons**

	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
Number reported	5	9	6	1	3	8	2	5	4	10
Incidence	0.7	1.4	0.8	0.2	0.4	1.0	0.3	0.6	0.6	1.2
Prevalence	1.1%	1.8%	2.1%	0.2%	0.9%	1.6%	0.8%	0.8%	1.8%	2.7%

Lumbar stress fractures are generally gradual onset injuries, most often occurring to the pars interarticularis part of the L4 and L5 vertebra and on the non-bowling side. They are also more common in younger bowlers and are prone to recurrence. These injuries extract the greatest toll on cricketers in terms of missed playing time per injury. Whereas cricket fast bowlers have perhaps the highest incidence of lumbar stress fracture of any type of athlete, the rate of these injuries in non-bowlers (batsmen and wicket-keepers) appears to be no higher than in the general population.

Studies have previously associated a 'mixed' action with the development of lumbar spine injuries, particularly stress fractures<sup>22–24</sup>. There is still no published data to show that coaching intervention can prospectively lower the lumbar stress fracture risk for a player, although it is assumed that this is the case.

Many more contracted fast bowlers in Australian cricket have suffered lumbar stress fractures as juniors prior to joining the first class pool of players. There appears to be neither a long-term reduction nor increase in the incidence over the last decade at first class level, although junior figures are unknown. It is presumed that biomechanical intervention has been helpful for fast bowlers but has not been able to eliminate lumbar stress fractures. Although not measured specifically by this survey, the biggest contribution of modern medical management has been that very few Australian bowlers are forced into retirement due to chronic back injuries. This was not the case in the past and is still not the case today in parts of the world (e.g. Indian subcontinent). Because stress fractures lead to a long layoff period for fast bowlers, further study is required to determine whether more aggressive management could still deliver the good long-term results we currently achieve.

### Side strains

**Table 18 – Key indicators for side strains in the last 10 seasons**

	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
Number reported	13	3	8	9	5	13	13	13	16	10
Incidence	1.8	0.5	1.1	1.4	0.6	1.7	1.7	1.4	1.8	1.2
Prevalence	0.7%	0.1%	0.7%	0.8%	0.3%	0.6%	0.8%	0.8%	0.9%	1.3%

Side strains are a classic cricket fast bowling injury. 'Side strains' appear to be a unique type of muscle strain<sup>25</sup><sup>26</sup>. They are only reported in cricket bowlers and javelin throwers, who use a somewhat similar technique. Side strains also affect the non-bowling side of the body and

are generally acute onset injuries. They may have a related entity ('side impingement') that is distinct and which has a more insidious onset. Side strains are more common early in the season (pre-Christmas) and are somewhat less prone to recurrence than other injuries. By legend, they have been

seen as a 'rite of passage' injury, in that a genuinely fast bowler should suffer one side strain in his career. However, they can be recurrent and occasional side strains lead

to chronic pain (where they are sometimes, with the use of nuclear medicine, re-diagnosed as stress fractures of the ribs).

### Thigh and hamstring strains

**Table 19 – Key indicators for thigh and hamstring strains in the last 10 seasons**

	2001–02	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09	2009–10	2010–11
Number reported	18	12	21	17	11	16	33	43	25	12
Incidence	2.6	1.9	2.9	2.6	1.3	2.1	4.4	4.8	2.9	2.5
Prevalence	0.7%	0.8%	0.7%	0.7%	0.3%	1.1%	1.6%	1.8%	1.5%	1.1%

Hamstring, quadriceps, calf and adductor strains all affect cricketers, as they do many other types of running athletes. According to the international survey definitions, hamstring strains are grouped with quadriceps strains to form a category of 'thigh and hamstring strains', of which the majority are hamstring strains. Again it is bowlers who are most prone to injury, but occasionally they occur in batsmen either whilst running between the wickets or fielding. All muscle strains can affect both sides of the body, but the mechanics of bowling leads to a predisposition for muscles strains to affect a particular side, in bowling. In the non-bowling side, shortly before delivery the leg undergoes acceleration, whereas the bowling leg undergoes deceleration. Hence hamstring injuries are more likely on the non-bowling side, whereas quadriceps injuries are more likely on the bowling side. Recent research has found that a past history of lumbar spine stress fracture is a risk for lower limb muscle strains, particularly calf strains, in fast bowlers<sup>27</sup>.

### Medical illness

Because cricket is often played in hot weather conditions it might be expected that dehydration was a common condition. This would be particularly expected in cricket played in Asian countries where not only are heat and humidity extreme, but gastrointestinal illness is also common and could be a contributory factor towards dehydration. Cricket is also in the minority of sports which do not readily allow for substitution due to injury or illness (with the exception of fielding). Despite these theoretical concerns, in practice it appears that most dehydration is mild to moderate and is successfully treated by oral rehydration. In competitive cricket and/or in very hot conditions, it is sensible preparation to have

intravenous rehydration facilities available nearby, should they be medically indicated (in line with WADA/ICC guidelines).

In terms of specific rates of heat illness in elite cricket, almost no cases reach the threshold of forcing a player to miss a game or be unable to bat or bowl due to the condition.

### Recommendations

- **Traditional workload preparation for fast bowlers to play first class cricket needs to be preserved as much as possible.**
- **More radical solutions to counter the effects of the modern schedule should be contemplated.**

Factors which would have been considered 'radical' in the past but which can be placed on the table for debate include: (1) allowing medical staff to be involved in team selection, to the extent of advising on rotation or that a minimum number of bowlers be selected; (2) formally encouraging more bowler-friendly pitches for Australian matches to minimise the likelihood of long stints of bowling on 'dead' tracks; (3) investigating whether fielding rotation policies could decrease the overall workload of fast bowlers on days in the field.

- **Further research is required to determine other risk factors for injury such as increased (or decreased) gym training or running and workload restrictions of teenage fast bowlers, to determine whether they are contributory factors to the increase in injury prevalence now being observed.**
- **Substitute player(s) should be allowed in first class cricket.**

Arguments for this include:

**\* The high rate of injury in first class games**

In > 30 per cent of first class games a team will have at least one player suffer an injury that either prevents continued participation in the game or causes him to miss the following game.

**\* Increasing fast bowler injury prevalence**

Fast bowlers are clearly not coping with the new make-up of the cricket calendar, which is here to stay given the eight year forward planning of the Future Tours Program and the popularity of the T20 tournaments.

**\* Risk of injuries worsening if players push through pain**

Serious injuries do occasionally occur in cricket and the expectation that a player should always push through pain for the benefit of the team could in rare cases be catastrophic.

**\* Risk of players being lost to Test cricket as T20 is a full-time career option**

Because of the lucrative contracts being offered by T20 franchises, it is an increasing option for players to 'retire' from first class cricket to become T20 specialists. If the rules of first class cricket remain as arduous as they currently are, T20 cricket will be seen by more players as 'money for jam' and the talent pool for Test cricket will diminish (along with perhaps the popularity of this form of the game).

**\* Benefits for amateur cricket – 12th man can become more involved**

Allowing the 12th man, plus perhaps other substitutes, to be fully involved in the game as specialist players would encourage more amateur players to enjoy cricket. No other team sport in the world makes a player suffer the indignity of being a substitute with no prospect for meaningful participation in the game.

**\* Redress balance of first class game in favour of bowlers**

The changes to modern first class cricket have been criticised for swinging the balance of the game too far in favour of batsmen, such as improvements in protective equipment and bat size, covering of wickets and shortening of the boundary dimensions. Fast bowlers suffer far too high an injury burden in cricket and rule changes should occasionally also favour the bowlers and swing the balance back into a fairer contest between bat and ball.

**\* Give Australia a competitive advantage**

Other than by lobbying the ICC, Australia does not have the option to change the rules of Test cricket. We do have the

option to change the rules for the Sheffield Shield. The major argument against doing this is that Sheffield Shield cricket would not replicate Test cricket as much with a substitute player. A major argument in favour is that if Australian cricket unilaterally introduces a substitute rule, it is highly likely that there would be a favourable impact on injuries to the pool of Australian fast bowlers. If there are fewer injuries in our squad bowlers, we have greater choice in selection for the national team, which would help provide a competitive advantage.

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References, as indicated within the article, are available at [sma.org.au/publications/sport-health/](http://sma.org.au/publications/sport-health/)

## Back pain: the important and the new



### Sports and interventional pain physician, Dr Bruce Mitchell discusses the important and novel aspects in back pain.

It was at a past World congress on low back and pelvic pain where I first heard the term: 'Lumpers and Splitters'. Let me declare I am an ultra-Splitter. The Lumpers are those that put all low back and pelvic pain as one homogenous group. They claim all of the data shows that nothing works on this homogenous group (except in some exceptions; their chronic pain clinic). They can back their arguments with a couple of meta-analyses, stating that if you apply these interventions to an undifferentiated group of low back pain (LBP) patients, nothing beats a placebo. The moral of this story is: don't believe meta-analyses!

**“In the absence of red flags, imaging and investigation in the non-athletic population with lumbar somatic pain are not necessary and can be counterproductive...”**

I usually start off talks on pain with a picture of an asylum from the mid-late 19th century. Once through those doors, you rarely came out. Various global terms were used to label the 'unfortunates' that went through those doors, but they included schizophrenics, obsessive-compulsives, those suffering mania and depression, the deaf, the dumb and 'social misfits'. Some of the greatest minds of their time teased out different diagnoses amongst these 'unfortunates' and developed treatments for the individual groups, some of which last to this day (in some form), others of which

have been replaced with better and more humane methods. They still cannot cure or control all of the mental illnesses, but I would guess the current psychiatric/psychological community make a significant difference to 98 per cent of people. I think it's safe to say those original psychiatrists would have considered themselves 'Splitters'. Also, safe to say, that the current debates in pain, especially LBP, reminds me of those asylums from the 19th century; contrasting those trying to put people in there, with those trying to get people out.

In this article I will talk about pain, the different types of pain, how they are diagnosed and treated, and the relevance of imaging.

### Pain

There are four types of body pain:

1. Visceral pain
2. Radicular pain
3. Neuropathic pain
4. Somatic pain

Some would correctly argue that radicular pain is a sub-type of neuropathic pain. However, the presentations, natural history and treatments of each are sufficiently different to justify their separation. Visceral pain (from the internal organs) is beyond the scope of this article and will not be discussed further. Radicular, neuropathic and somatic pains are diagnosed by the quality of the sensation, not by examination or by imaging (1; 2).

## Radicular pain

This pain is due to irritation of a spinal nerve root or Dorsal root ganglia. It is believed this irritation is more chemical than mechanical. The most common cause is an acute disc prolapse, protrusion, or tear of the annulus, with leakage of the nucleus material into the epidural space. Radicular pain is a narrow band which shoots from the trunk into the limb. In the case of lumbar radicular pain, the sensation will usually start in the buttock. It is a continuous, narrow, non-dermatomal line from its start to its finish and is described as a knife like, 'lightening' pain, or an electric shock.

People often, mistakenly, use the term radiculopathy interchangeably with radicular pain. Radiculopathy is the finding, on examination, of neurological signs consistent with compromise or damage to a spinal nerve root, such as a lost reflex, or weakness of extensor hallucis longus (L5). While they may co-exist, they are separate conditions. True radicular pain is usually associated with a very positive straight leg raise (zero to ten degrees) and a positive cross-over sign (lifting the unaffected leg reproduces the pain).

**“People often, mistakenly, use the term radiculopathy interchangeably with radicular pain.”**

Radicular pain is a self-limiting condition and will usually resolve within three to twelve months. However, the pain is usually so awful that people cannot wait out its natural course. Caudal or trans-foraminal epidural steroid injections (not inter-laminar) treat this condition very well and can control the pain until it resolves. Surgery also works very well for this condition, whether it is nucleoplasty, micro-discectomy, laminectomy or fusion (if the segment is unstable).

## Neuropathic pain

Neuropathic pain is due to nerve damage or central sensitisation. The nerve damage is rarely overt. Neuropathic pain is described as a burning, tingling or buzzing sensation. There may also be localised electric shocks in the area.

The neuropathic pain may be associated with areas of allodynia or hyperalgesia, but these are not necessary to make the diagnosis. The diagnosis is based on the quality of the pain being as described above. Freynhagen found that in 8,000 people with LBP, 37 per cent had predominantly neuropathic pain (3). These people do NOT cope well with hands-on therapy, which will often flare their pain for several days.

**“...in 8,000 people with low back pain, 37 per cent had predominantly neuropathic pain...”**

Treatment of neuropathic pain is with medication; initially one of the tri-cyclic anti-depressants (TCADs). The most common one used is amitriptyline, although some practitioners prefer nortriptyline. If using amitriptyline, it is essential to start with very small doses in the chronic pain patient. The author will often start at 2.5mg at night in women less than 50kg. If the TCADs do not work, then anti-epileptic medication is the next step, often gabapentin or pre-gabalin. Occasionally the older (and cheaper) anti-epileptics are adequate. There is reasonable data supporting tegretol in trigeminal neuralgia.

It is not unreasonable, and there is some evidence supporting a series of epidurals in someone with neuropathic back or leg pain with evidence of a compromised nerve root on examination or imaging. If short term relief is obtained, then a surgical opinion is warranted. If none of the above options are adequately controlling the neuropathic pain, then a Ketamine infusion or Neuromodulation should be considered.

**“While they may co-exist, they are separate conditions.”**

## Central sensitisation

This occurs at three different levels:

1. Primary Afferent Neuron (PAN)
2. Spinal cord level
3. Brain stem

The Primary Afferent Neuron (PAN) is a secretory organ with naked receptors on its tip. Baseline secretion of neuropeptides from the PAN cause low-grade vasodilation and chemotaxis. Absence of these secretions causes loss of tissue turgor, dry tissues, thinning dry skin and loss of hair. A PAN's naked receptors are activated by stretch, chemical irritation and thermal irritation. All of these cause vasodilation, stretching the PAN, activating its mechanoreceptors as well as creating a feed forward loop. Once activated, the PAN sets off a neurogenic inflammatory cycle. After 2–3 hours of stimulation, gene transcription occurs, which increases the sensitivity of the PAN. There may be permanent changes in the dorsal root ganglion (DRG) once gene transcription occurs (the concept of preventative analgesia comes from this). Once these changes occur, there is lowering of the activation threshold in the PAN and then development of hyperalgesia and allodynia in the PAN's receptive field.

8/10

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At the spinal cord level, central sensitisation occurs via three mechanisms:

1. Transcription independent (secondary messenger cascades from the PAN). Each PAN inserts over several different spinal levels, hence once the sensitisation occurs here, the area concerned grows rapidly.
2. Transcription dependent (gene upregulation within the DRG).
3. Death of the inhibitory interneuron (permanent). The PAN and the wide dynamic range (WDR) neuron compete at the DRG. The gate theory is alive and well here. The WDR activates the inhibitory interneuron to suppress input from the PAN, the PAN inhibits this interneuron. When over stimulated, the inhibitory interneuron dies, allowing unfettered access for the PAN to the DRG.

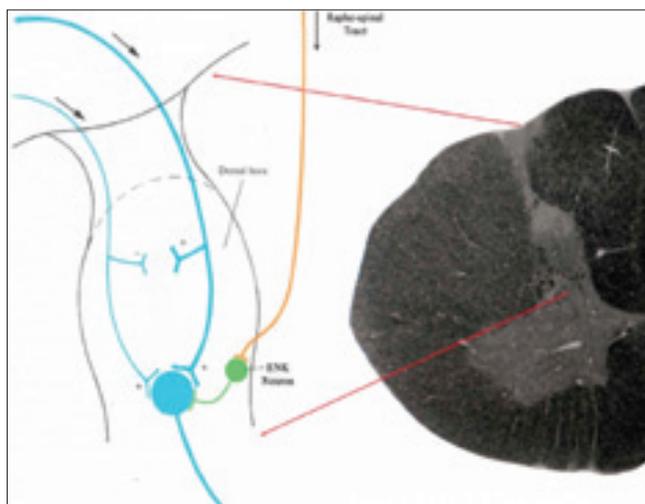
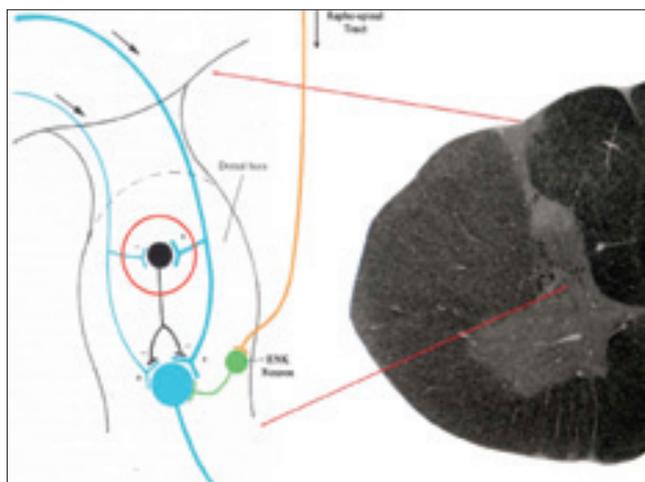


Figure 1: Death of the inhibitory interneuron (diagram courtesy of Dr Frank Wellard).

Pain is perceived in the brain, with different parts of the brain responsible for the pain experience:

- The somatosensory cortex discriminates pain, where it is and what it is.
- The insular cortex organises the response to pain.
- The cingulate gives an affective response.
- The amygdala causes fear, based on past responses.
- The prefrontal cortex, based on past experience, says this not a good idea, it is a cognitive response.

There are strong connections between the amygdala and prefrontal cortex, with the prefrontal cortex being good at suppressing the amygdala. Inadequate control here leads to irrational fears. But the body needs to be able to have an emergency response, such as when you wake up on the wrong side of the road with a truck coming at you: you need to react. In this situation, the brain stem activates and floods noradrenaline (NADR) throughout the brain, causing an activation of the autonomic nervous system and an increased release of cortisol. This flooding of the brain with NADR shuts down the prefrontal cortex. It is a very rapid feed forward mechanism designed so that the organism doesn't think, it reacts.

**“The concept... that someone can drive a car into a tree at 100KPH, or fall ten metres onto concrete, and suffer one injury, which should be resolved after six weeks, is blatantly ridiculous.”**

Chronic pain can sensitise this system both in the brain stem and amygdala, causing a chronically hyper-aroused system. The effect on the patient is they can't concentrate, they feel emotional, they can't focus and they make 'gut' reactions to situations. Sound like any of your patients?

### Somatic pain and somatic referred pain

Somatic pain is generated from a somatic structure (joint, muscle, tendon, disc). It is described as a deep, dull ache, pressure or a sharp pain. It is deep and hard to localise. It can jump from area to area, but tends to be a constant pain. If the pain is severe, it is not uncommon for the pain to spread down the leg. Indeed most people presenting with LBP and leg pain will have somatic referred pain, NOT radicular pain.

**“It was at a past World congress on low back and pelvic pain where I first heard the term: ‘Lumpers and Splitters’.”**



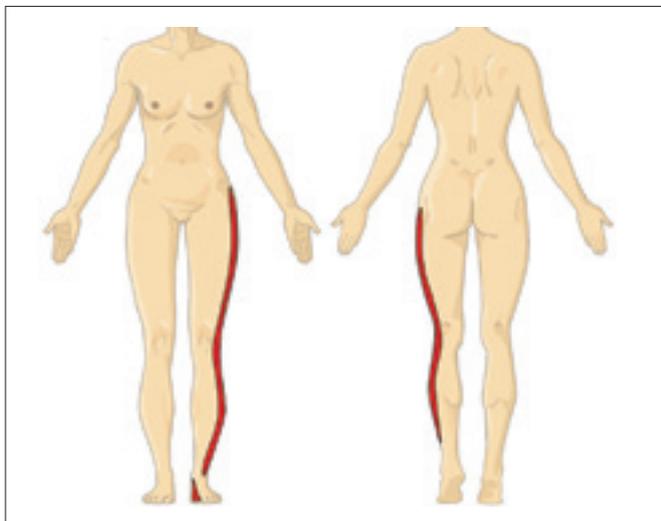


Figure 2: Radicular pain.

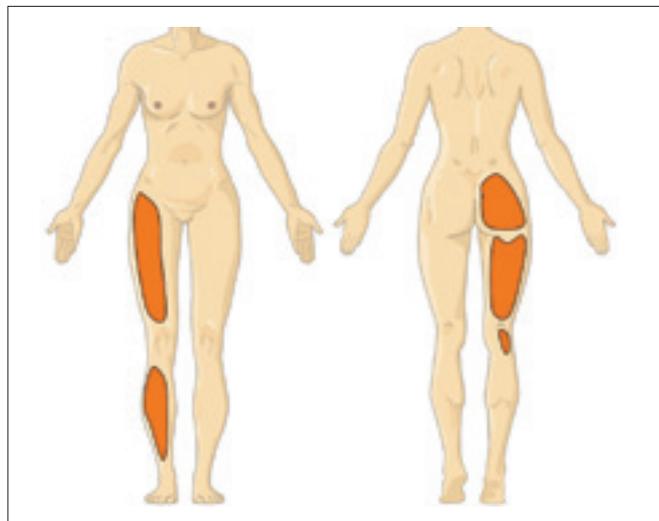


Figure 3: Somatic pain.

Evidence based medicine shows people presenting with acute somatic LBP have four complaints, all of which need to be addressed by the therapist. (4; 5):

1. I can't move
2. I hurt
3. I can't work
4. I'm scared

**“... the body needs to be able to have an emergency response, such as when you wake up on the wrong side of the road with a truck coming at you: you need to react.”**

In the absence of red flags, imaging and investigation in the non-athletic population with lumbar somatic pain are not necessary and can be counterproductive (6–8).

Red flags:

- Trauma
- Age <16, > 50 with first onset
- Past history of cancer or IV drug use
- Systemically unwell
- Cauda equina symptoms/signs
- Worse at night
- Thoracic pain

**So, what are the structures that can cause somatic pain?**

Smyth and Wright performed experiments where they probed different structures in the back to see what caused pain (9). They divided the structures into those that always caused pain, those that frequently caused pain, those that rarely and never caused pain. The results are listed below:

**Structures that hurt in the lumbar spine:**

Always hurt:	Dermis
	Endplate
	Posterior annulus
	Inflamed DRG
Frequently hurt:	FJ capsule
Rarely hurt:	Periosteum
Never hurt:	Muscle
	Fat

However, it is the small nerve fibre system that is critical for causing pain. Anywhere there is a small nerve fibre, there can be pain. The small fibre system is anywhere there is fascia, with different densities of fibres in different fascia and between individuals. A nerve can hurt if you bend it; it still functions as a nerve and conducts, but the small fibres in its sheath can generate nociception.

Small fibres are in synovium, their numbers are usually very small, but if the synovium is inflamed, the number of small fibre branches increases exponentially (there is still the same number of nerve cell bodies, but their branches increase in number). Normal articular cartilage is aneuronal, but neovascularisation of the underlying bone from cartilage damage carries in small nerve fibres, allowing nociception. There are few small fibres in the centre of bone, but there are lots in periosteum. A normal Intervertebral disc has small fibres in the outer third of the annulus, but a disc in which there is internal disc disruption will have a much higher density of small fibres, that penetrate further into the disc. The reality then, is that anywhere there is bone, periosteum, synovium or fascia, pain can be generated.

Despite the many billions of dollars in direct and indirect costs per year in low back pain, Anthony Schwarzer's study (10–12) is still the only prevalence study using diagnostic blocks. There were flaws with this study, which have caused the disc number to be too high, and facet joint and sacroiliac joint numbers to be too low, but the major problem with this study was a Type II error. To get into the study, an experienced clinician felt you needed disc treatment.

The prevalence numbers from this study were:

Disc	40 per cent
Facet joint	15–45 per cent
Sacroiliac joint	13–30 per cent

Several authors have listed the hip as an additional source of pain (13–15).

There is excellent research into physiotherapy diagnosis and treatment of somatic low back and pelvic girdle pain, based on signs and groups of signs, that is outside the scope of this article. We should be proud of the leading role Australian researchers are taking in this area.

It is possible, probable even, in the chronic patient or someone who has suffered multi-trauma, for the patient to have mixed Somatic and Neuropathic pain. Some patients even have radicular, neuropathic and somatic pains at the same time.

The concept, espoused by third party payers, that someone can drive a car into a tree at 100KPH, or fall ten metres onto concrete, and suffer one injury, which should be resolved after six weeks, is blatantly ridiculous.

## Conclusion

It is critical that any therapist working in back and pelvic girdle pain is able to recognise the type of pain a patient presents with. The world's greatest physiotherapist is not going to make any difference to someone with radicular pain and will probably only worsen someone with neuropathic pain. These people need urgent referral to a pain specialist or surgeon. There are currently randomised controlled studies going on around Australia looking at new injectable treatments for radicular pain, with promising pilot study data.

Mixed somatic and neuropathic pain may be amenable to physiotherapy, but both therapist and patient needs to be conscious of the fragility of this pain.

Central sensitisation with somatic pain may be amenable to conservative treatments, but if the sensitisation progresses, these patients need urgent referral for anti-neuropathic pain medication. Straight lumbar somatic pain warrants a dedicated period of physiotherapy and rehabilitation. Failure to improve by three months, however, should lead to referral to a pain specialist.

### Dr Bruce Mitchell

MBBS, FACSM, FACSP, FASMF, MPainMed, FIPP

Bruce is a sports and interventional pain physician, and a Research Fellow at the University of Melbourne, Centre for Health, Exercise and Sports Medicine (CHESM). He has a special interest in the management of hip, buttock, back and groin pain; and in neuromodulation. He is an active researcher in these fields and has published extensively. He is a Fellow of the American College of Sports Medicine and has completed a Masters of Pain Medicine. He recently completed the International Fellowship of Interventional Pain Practice.

References, as indicated within the article, are available at [sma.org.au/publications/sport-health/](http://sma.org.au/publications/sport-health/)



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## The keys to business success

To help make the most of your business, *Sport Health* brings you the following business insights.

### Why you need a vector file of your business logo

Brought to you by Papercut



A vector file of your logo is one of the most valuable items you can have in your business brand kit.

#### What is a vector file?

It's a file that was created in Adobe Illustrator or a similar drawing program. It's called a vector file because these programs create designs that are based on a series of points and lines instead of pixels. Graphic designers create vector files so that logos and other images can be easily converted to a wide range of sizes without distortion.

#### What might you need it for?

If your design requires your logo to be enlarged or reduced, the vector file will easily scale up or down and maintain a clean, crisp result. A vector file can scale up to the size of a billboard without altering the quality.

Vector files are on a transparent background – so you can layer the logo over a new colour without having fuzzy edges or a white box. For example, if you need to place your logo in an advertisement with a dark background, then the logo will sit neatly on the background. Vector files are easy to modify with the correct software. If you need to change the colours for any reason (perhaps you have a 3-colour logo but you're printing 2-colour promotional items to save money) – then your vector logo is easily changed.

#### Who might need it?

Printers, graphic designers, website designers, advertising companies, sign designers, t-shirt and promotional product printers will all require your logo in a vector format.



#### How can you tell if you have one?

Go through your set of logo files and look for a file that ends in **.ai**, **.eps** or even **.cdr**. If you don't have any of these, but you have a high resolution PDF of your logo, you can ask a designer to try opening that file to see if it's a vector file in disguise.

#### What if you don't have one?

If your designer only gave you a JPEG of your logo, then never fear. When you have a need for a vector file, a designer can trace the JPEG logo for you and create a vector. Just make sure to get a copy of the new vector file – and to archive it for future use.

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## How to make your business worth more without you

Brought to you by Peter Rankin – Davidsons



*"My customers will be with me until the day I die".\**

*"My business is my identity".\**

*"My business is my superannuation".\**

Sound familiar?

### What does reducing key person reliance mean to you?

A business owner that relies heavily on its owner is not as valuable as a business that is not reliant on its owner. Many business owners don't understand how reducing or minimising the risks of key person reliance can significantly improve the value of their business.

Compare the following valuation scenario of the same business when key person reliance is reduced or minimised.

	Business key person reliant	Same business not key person reliant
Business profit	\$200,000	\$200,000
Business cap rate**	3.05	3.5
Business value**	\$610,000	\$700,000
Value improvement		\$90,000
Improvement per cent		14.75 per cent

Buyers will pay a higher price for a business that can be easily integrated into their current business or smoothly transitioned to a new principal. They will want some comfort that the business' key customers and staff will stay with the business once the current owner departs.

### What can you do to reduce or minimise the risks of key person reliance?

There are many different business and risk management strategies business owners can implement to reduce or minimise key person reliance. The table below provides some suggested examples.

Strategies	Actions
Business	<p><b>1. Business systems:</b> introduce systems into your business. For example, a good quality stock management system will reduce reliance on the owner's product and services knowledge.</p> <p><b>2. Client relationship management:</b> establish customer relationship management protocols so staff can manage key customer relationships.</p>
Risk Management	<p><b>3. Management succession:</b> invest in the professional development of your key staff so they can eventually share in part ownership (succession planning) of the business. The very nature of some businesses means it is difficult if not impossible to reduce or remove key person reliance. A specialist surgeon is an example of an occupation that will always be key person reliant. In this case where key person reliance cannot be removed or reduced the purchase of business insurance is considered an effective risk management strategy.</p>

START assessing the impact of key person reliance on your business by completing an outline business valuation. Your accountant or financial planner is best positioned to provide advice on key person reliance, business valuation and business and risk management strategies to reduce, remove or minimise the risk from key person reliance.

\* Quotes from proud small business owners.

\*\* Business Value determined by Bstar's Bank Accredited online Business Capitalisation Rate Calculator.

For further information please contact Peter Rankin at Davidsons, [peterr@davidsons.com.au](mailto:peterr@davidsons.com.au)

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## Employers choose Facebook for screening candidates

Brought to you by Angelique Lele,  
General Manager, Sportspeople

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More than a quarter of employers use social media to check out potential new hires, and Facebook is the site of choice, according to new survey findings from Telstra.

The poll of 1,255 employers found that one in four respondents screened candidates' profiles on social networking sites.

The most popular tool for background-checking candidates was Facebook (41 per cent), followed by LinkedIn (31 per cent) and Twitter (14 per cent).

Some 44 per cent of employers said an applicant who posted derogatory comments about their current workplace was unlikely to be hired, followed by discriminatory comments (37 per cent) and posts with confidential information (32 per cent).

Sportspeople raised this issue last year after talking to a group of students at a University who were unaware of what their online footprint can say about them. It may sound a bit egocentric, however searching for yourself on Google can be a wise career move. Your facebook profile may be set to 'private', however that drunken profile picture may still be visible to potential employers who are increasingly utilising the internet to do background checks on potential employees. Of course this could also work in your favour if you have appealing and professional results.

Here are some tips to improve your online profile:

- Remember that many posts online are permanent or very difficult to remove, so be thoughtful when you decide to post online (e.g. comment in an online forum).
- Be prepared to answer to any incriminating information that can be found.
- Search your name in combinations. Your profile may disappear amongst all the other John Smiths', however if searched with the name of a previous employer/ school/hobby then you might become more visible.

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## Starting your own practice



**Podiatrist and owner of Windy Hill Podiatry, Matthew Mollica discusses the considerations to think of when starting your own practice.**

Shortly after graduating from Podiatry in the mid-1990s, I took the step of opening my own practice, not knowing all of the pitfalls, obstacles and headaches that lay in wait. Podiatry, like so many health professions, affords one the opportunity to practice in a myriad of settings, either public or private, within a multi-disciplinary group setting, or by themselves. The rewards can be great, but so too the frustrations and difficulties.

Starting a practice from scratch presents a clean slate, with a wealth of opportunities ranging from where exactly to establish a practice and what to call it, to formulating a mission statement, a set of values, and other guidelines that become the foundation of what hopefully becomes an established, recognised and successful clinic.

The following is a collection of observations compiled through the last 16 years, dating back to the time of establishing my own practice in the mid-90s. These are presented in no particular order, as well as my fuzzy memory will allow!

University does a good job of putting us at the 'start line' so to speak, in that it arms graduates with many tools they will require to commence their professional career, with regard to vocational knowledge. University does not however, arm us with all the necessary tools to survive and thrive within a corporate world. One in which legislation, compliance and liaison with third parties takes up ever-growing time.

Seeking the advice of a more senior mentor, or even similarly aged colleague from a more business-oriented/commercial field may be invaluable to young Health Science graduates thinking of starting their own practices. There are simply so many bodies to speak with, and so many pitfalls to avoid. The notion of a senior clinician filling a mentoring role is also of great clinical benefit as the words and lessons from someone who has 'been there and done that' can be worth its weight in gold.

Local council, leasing companies, yellow pages, AHPRA, specialist registration bodies, professional indemnity providers, income protection insurance agents, superannuation organisations, business name registration, Tax Office, HICAPS, credit card/merchant services, Telstra (or other IT/telephone provider) and countless other organisations will all become intimately familiar to you.



“The sense of satisfaction from starting something on your own and watching it grow can be immense.” Therein lies the opportunity to realise your own vision and have things done the way in which you want them to be done. This brings us to an important point, in that it is important to allow room for growth. In the early days, your practice may seem very small and not at all busy. I remember sitting behind my desk for hours at a time with no patients, often returning home at the end of a 9am to 6pm work day having treated two people. These days, less than two decades on, there are several practitioners working alongside me, each of us with waiting lists longer than we would like, producing almost unavoidable delays for new patients and people with acute needs. At the time of a business first starting out, it is important to recognise that things will get busier, your clinic more and more hectic, and your shelves of patient files more and more full. Your life will also get busier. Heaven forbid you get married and have kids on top of it all!

**“Too often, things can go sour when a practitioner is blinkered, and focuses solely on what they can do, rather than recruiting others to assist.”**

It is important to plan ahead and put systems in place (from day one) that will allow your clinic to meet the demands the future will bring. This may mean renting or purchasing a space which is of sufficient size so as to allow room for expansion, or even selection of a name for your clinic which will allow expansion to include other practitioners in times to come. Whilst many extol the virtues of practicing under your own name, selecting a clinic name which becomes the title for a group is also worthy of consideration.

**“...I took the step of opening my own practice, not knowing all of the pitfalls, obstacles and headaches that lay in wait.”**

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- ❖ Degree in Podiatry
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- ❖ Strong interpersonal skills are essential

**If you are interested to apply, you may submit an online application at:**

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**Website:** <http://www.sgh.com.sg/JoinUs>

**Only shortlisted candidates will be notified.**

Registering the name of your clinic is an important and often forgotten step. Contacting the business registration body within your State or Territory is relatively straight-forward and relatively inexpensive. It involves little more than completing the paperwork and paying the requisite fee, as is the case with acquisition of an ABN or other requirement. One word of caution—dozens of unscrupulous people seeking commitment for advertising dollars seem to have access to the names and contact details of people who are new recipients of business name registrations. These people will contact you and try to leech money from you for advertising. A quick ‘no, thank you’ and hang up should suffice...

Be very clear in how you wish to position yourself and your services, and how this is presented to the community at large. Do you see yourself and your clinic as a general practice offering services to those patients with a variety of needs, or are you more of a specialist? Reading *Sport Health*, it would be safe to assume that a passing interest in sports medicine is a minimum. Your name, advertising strategy and even logo and letterhead, may wish to reflect this speciality. The same can be said of advertising strategy and even the décor/interior of your clinic.

**“Starting a practice from scratch presents a clean slate, with a wealth of opportunities...”**

There is always a tendency for practitioners to focus on what they themselves can do to help the patient, but experience has taught me that a good referral network is one of the most important tools a practitioner can possess. Knowing who to refer to, when to refer and what other practitioners can do, is a very valuable skill. One cannot start too early in their professional career to develop this. It can be a great help for patients and clinicians alike. Too often, things can go sour when a practitioner is blinkered, and focuses solely on what they can do, rather than recruiting others to assist.

Many new businesses, irrespective of their nature (retail, IT, health, personal services, hospitality and others) fail in the early years due to financial pressures and management errors. Seeking help from a qualified financial planner and tax accountant will help reduce the risks of failure. Consulting these people from the outset is worthwhile, as it allows a sound structure to be put in place and budgets to be formed. This can relate to a myriad of fiscal factors such as superannuation, quarterly Business Activity Statement and GST-related issues, lease and purchase of essential clinical equipment, patient billing, employment costs and PAYG tax, and other monetary issues related to the running of a business in this day and age.

**“The sense of satisfaction from starting something on your own and watching it grow can be immense.”**

Preparing oneself mentally for the unrelenting pressures of owning and operating your own business is something I suspect few people do. Owners of small businesses and particularly sole practitioners may lock the front door at night, but the thoughts of their clinics and patients never really leave their minds. There are tremendous highs and lows with patient treatment success and patient difficulties, with the constant demand as well as the highs and lows of patient interaction proving a significant load for many clinicians to carry.

Certainly there are many benefits to be enjoyed from starting your own clinic and watching it mature as you grow into your profession. These joys and rewards are not without responsibilities, and they only come with organised and diligent effort, both in managing your business, and in working every day as the best clinician you can be.

**Matthew Mollica**

Podiatrist  
Windy Hill Podiatry



## Tennis anyone?



An interview with Dr Tim Wood, Sport and Exercise Medicine Physician and Chief Medical Officer of the Australian Open.

### What is your professional background?

I have been a Sport and Exercise Medicine physician since 1995 having completed my Fellowship training through the Australasian College of Sports Physicians, and have worked in full time solo private practice in Hawthorn, Melbourne since that time. Apart from my involvement with tennis, I was the AFL Draft Camp medical coordinator for many years, club doctor with the Geelong Football Club (AFL) from 2006–11 and worked for the Melbourne Rebels (Rugby Union) in their inaugural season in 2011. Recently I have taken on a new role as one of the doctors for the Richmond Football Club (AFL). I am also currently the Vice President and Dean of Education of the Australasian College of Sports Physicians.

### Tell us a little about your current role outside of the Australian Open.

I have a good relationship with local GPs and physiotherapists and treat a broad range of sporting and non sporting individuals, with an age range of 4–97.

### “Finding yourself in Andre Agassi’s room with Steffi Graf also there was quite an experience.”

Sports injuries take up about 60 per cent of my work. Common injuries that I treat include: extensor tendinopathy (elbow), plantar fasciitis, and various shoulder, hip and knee pathologies.

I view one of my roles is to encourage patients to undertake some form of regular exercise for 30 minutes each day and provide them with advice on what program would be suitable for their age, ability and interest.

I occasionally see some of the more complex chronic pain patients, having completed a Masters in Pain Medicine in 2000, and do independent medical examinations for WorkSafe.

### What is your role at the Australian Open and how did you become involved in working with tennis players?

Towards the end of 2001 I was approached by Tennis Australia to see if I was interested in working at the Australian Open. After a series of interviews, I was appointed chief medical officer of the tournament. The 2012 Australian Open was my 11<sup>th</sup>.



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**Are there other practitioners you work closely with in your role? Tell us a little about these working relationships in terms of handling the tennis players.**

In the player medical centre a nurse greets and triages the players as they come in. Up to 40 to 50 per cent of our work consists of general practice type problems, i.e. coughs, colds, and sore throats. Three Sport and Exercise Medicine physicians – Anik Shawdon, Gary Zimmerman, and Hugh Seward work with me plus a general practitioner, Jenny Altermatt. In the locker rooms where the players change there are both ATP, WTA, and Australian physiotherapists and massage therapists who attend to the players. If they are concerned with an injury they will refer players to us in the medical centre.

We also have onsite diagnostic ultrasound each day from 6–8pm depending on demand and this year we are using a shockwave therapy machine where appropriate.

**What are some of the more common medical/fitness issues tennis players have? And how do these injuries usually occur?**

Fifty to sixty per cent of injuries that we deal with are tennis related injuries which range from shoulder pain of multiple aetiology, elbow, wrist, back, knee and foot pain. We also see a lot of tendinopathy as players are returning from their off season (November/December) when they see us. Players increasing their training load too quickly and the hard courts can stir up the tendons so we see patellar, Achilles, and elbow tendinopathy (extensor and flexor). We are also seeing more non-dominant wrist injuries with the popularity of the double-handed backhand.

**“During the peak of the tournament we would treat up to 40 to 50 players a day but in the last few days the numbers drop off.”**

One of the most common acute muscle strains on court is that of the rectus abdominis on the non-dominant side with serving. We see about 8 to 10 a year. Hips are also starting to become an issue with the change in technique putting more rotation and stress on hips.

Sometimes we may come across an injury for the first time. In my first year we had players complaining of a vague aching pain around their elbow which we subsequently diagnosed as distal humeral bone marrow oedema. We have seen it over the years since and have gone on to publish a paper in the *British Journal of Sports Medicine* and notify the worldwide

tennis community. I now see it in some of our juniors who are playing high intensity and high level tennis through to some of the seasoned professionals in their mid 20s. Currently we are developing an interest in posterior instability of the shoulder in tennis players as a number of players have recently had surgery for this condition.

**What does a typical day at The Australian Open consist of?**

The clinic is open 10 days before the main draw (January 6 this year) at 9am each morning. A meeting occurs at 8.30am with the physiotherapists reporting on the players that were seen the previous day so all medical staff are up-to-date and can ensure the players that need to be followed up on are. Matches start at 11am. During matches we need to be available via walkie talkie to do court calls with physiotherapists should a player become unwell, incur an injury or request to see a doctor. The medical clinic closes half an hour after the last match finishes.

During the peak of the tournament we would treat up to 40 to 50 players a day but in the last few days the numbers drop off.

**Have you seen any change in terms of medical treatment during your time at The Australian Open?**

I think our knowledge of tennis injuries has advanced as have our facilities. A facility revamp now sees us with access to a reception area and two consulting rooms where previously we only had one for the first few years. There is better coverage with two doctors on during the day. Our knowledge of injuries has also certainly changed with the increased prevalence of two handed backhands, and the speed of the game. We have seen some injuries emerge over the last 10 years that weren't seen prior to my involvement.

**Tell us your most interesting encounter while working at The Australian Open?**

One of the most memorable encounters was on the eve of my first tournament, being called by the former tournament director, Paul McNamee and asked to go to the Como Hotel to see Andre Agassi who had a wrist injury that led to his withdrawal from the tournament. He was seeded number 1 at the tournament and he was on a plane home before the first ball had even been hit. It actually gave Lleyton his best chance to win an Australian Open but unfortunately he was getting over chicken pox and he was knocked out in first round. Finding yourself in Andre Agassi's room with Steffi Graf also there was quite an experience.



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# BE ACTIVE 2012

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We encourage all researchers, practitioners, policy makers and students who wish to present their work to submit abstracts for presentation at the ICPAPH, the ACSMS, or the NSIPC.

ACSMS and NSIPC will again be offering The Australian Sports Medicine Federation Fellows Awards. A complete list of awards and conditions will be posted on the website

All abstracts must be submitted online at [WWW.BEACTIVE2012.ORG](http://WWW.BEACTIVE2012.ORG) and must be received by 31 March 2012.

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P +61 2 6230 6671 | F +61 2 6230 6676 | [acsms@sma.org.au](mailto:acsms@sma.org.au)

### What are the highlights and challenges working at the Australian Open and with elite sportspeople?

One highlight is working with a great team of doctors, nurses and physios. We have had a stable team now for a number of years that the players can feel comfortable with. It is fantastic to come together with local and ATP and WTA physios and share our knowledge and expertise. It is a privilege and pleasure being able to assist these players, for them to have the confidence and trust in us to deal with their injuries and respect our advice.

A challenge is the different injuries, the ones you don't see in any other sport. You learn to recognise these types of injuries and provide good sound advice to manage them, i.e. whether it is safe to continue playing or whether to withdraw from the tournament.

### Have you been inspired by anyone you work with/treat at the Open?

Certainly Andre Agassi at the start of my involvement and what he achieved in tennis and after his retirement. Subsequent to

that the professionalism of Roger Federer in everything that he does. He is an absolute gentleman to deal with. I think he fulfils the criteria of a good role model in sport, with his humility and graciousness in victory or defeat. He shows all his emotions whether winning or losing. You would have to look up to Roger as someone to aspire to.

### What advice would you give other sports medicine professionals looking to work with elite sportspeople or at an elite event?

I think number one is to be passionate about the sport you want to work in. Spend time learning as much as you can about the sport and injuries that it throws up, the challenges of looking after those athletes both during competition and between events. Volunteer to watch, listen in and learn from those already treating in that sport. Finally read up as much as you can in journals and attend conferences.

**“Fifty to sixty per cent of injuries that we deal with are tennis related injuries which range from shoulder pain of multiple aetiology, elbow, wrist, back, knee and foot pain.”**



## Inaugural IOC Advanced Team Physiotherapist Course



Delegates and presenters from the Inaugural Advanced Team Physiotherapist course. **Front row:** Hugh Saweni (PNG), Charleen Silcock (Cook Islands), Epenesa Young (Samoa), Sharlene Nand (Fiji), George Regenvanu (Vanuatu), Mark Brown (Presenter). **Middle row:** Alysha Blackwell (NZ), Chelsea Lane (NZ), Liana Cole (Australia), Maria Constantinou (Presenter), Godfrey Waidubu (Nauru), David Zuker (Presenter). **Back row:** Peter Georgilopoulos (Presenter), Ross Smith (Presenter), Erin Smyth (Australia), Brooke Cranney (Australia) Craig Allingham (Presenter). **Other presenters not pictured:** Dr Peter Friis, Julie Gilbert, Bruce Rawson, Jeff Murray, Greg Craig.

### SMA recently received funding to hold a physiotherapy course for Olympic Team physiotherapists from a range of Oceanic countries.

Thanks to funding from the International Olympic Committee, physiotherapists from several Oceania countries had the opportunity to attend the first IOC Advanced Team Physiotherapist course, held last November in Brisbane. Having been nominated by their National Olympic Committees, participants from throughout Australia, New Zealand, Papua New Guinea, Fiji, Cook Islands, Vanuatu and Nauru had the opportunity to gain high level training to improve their ability to prevent and manage injuries and medical conditions in their role as Team Physiotherapists.

While the IOC Medical Commission has overseen and funded through Olympic Solidarity several similar Advanced Team Physician courses internationally for doctors, this was the first such course for physiotherapists. Sports Medicine Australia and the Australian Olympic Committee were invited by the Oceania National Olympic Committee (ONOC) to develop and coordinate the course. The Course Coordinator was Mark Brown, the SMA QLD Executive Officer and a Sports Physiotherapist who has worked at several Olympic Games. Mark pulled together a stellar list of health professionals with extensive experience working with Olympic and other international athletes from several disciplines to present the course. Mark paid particular credit to the assistance

of Lauren Fitzgerald, the Manager of Sports Services from the Australian Olympic Committee in the development of the course, and also to David Zuker, Australia's first Olympic Team Physiotherapist who is now a committee member of the ONOC Medical Commission for his assistance and insights.

The course units were based largely on The Olympic Movement Medical Code, the IOC Sport Medicine Manual and IOC Consensus statements and other evidence based guidelines, as well as the core competencies expected of Sports Physiotherapists as defined by organisations such as the International Federation of Sports Physical Therapists and the Australian Physiotherapy Association. In developing the course special consideration was given to the limited resources likely to be available to physiotherapists working in developing countries, or while working with travelling athletes and at sporting venues.

Participant feedback was very positive with most of the delegates expressing the hope that similar courses could be held on a regular basis in the region. Chair of the ONOC Medical Commission Dr Chris Milne said the course was very timely in the lead up to the London Olympics. *"Many of the physiotherapists in our region have limited opportunities to participate in this sort of training. The training provided may expose participants to information that helps them to improve the level of care and the performance of an athlete. These are very important outcomes for many of our Oceania nations."*

## Celebrating five years of sports training to Japanese students



Japanese students from the 2010 program presenting a signed football to Trish Donoghue, SMA ACT Executive Officer.

### **SMA ACT Executive Officer, Trish Donoghue recently headed to Japan to celebrate the 5<sup>th</sup> anniversary of SMA ACT's intercultural exchange program.**

In 2007 the start of an exciting new intercultural exchange program between students from Fukuyama Heisei University in Japan and SMA ACT began. The program was established to assist students studying within the sports medicine industry, and to provide them with the opportunity to travel to Australia to broaden their course learning outcomes, teaching curriculum and expose them to the resources and professionals which SMA and Australia has to offer.

SMA ACT Executive Officer, Trish Donoghue travelled to Japan on November 12, 2011 to celebrate the program's five year anniversary and visit a number of other Universities who have a strong commitment to international exchange programs within the sport related field.

Whilst in Japan two other universities expressed delight in SMA ACT's visit, particularly Hiroshima University of Economics, noting that the timing was exactly right for their students. This University has just started a new program, 'Sports Management' and is eager to offer their students the opportunity to participate in future exchanges.

We look forward to potentially working with these new Universities and to the continuing success of the program.

#### **Trish Donoghue**

Executive Officer, SMA ACT  
trish.donoghue@sma.org.au

"The program highlights the wealth of resources which ACT has to offer and provides an opportunity for Japanese students to study sports medicine from a different perspective whilst experiencing Australian culture and language."

"The fact that the students are willing to travel so far to take part in our program reaffirms Sports Medicine Australia's reputation as a world leader in injury prevention initiatives and courses."

*Peter Garbutt, SMA ACT President*

"It was very nice to have SMA ACT visit Hiroshima, Japan! The visit has given us many positives to strengthen the links between SMA ACT and Universities here in Hiroshima."

"The President and Vice President of Fukuyama Heisei University were very impressed by the visit. The President mentioned that the SMA ACT program is the best in regards to the contents, preparation and hands on approach based on students' needs among other programs that are offered at the University. In addition, at Fukuyama Heisei University, two athletes who participated in the lecture given by Trish Donoghue, who were in the Japanese Olympics team, were enthusiastic enough to chase her back to the faculty room to ask more questions."

*Hiroshi Yoshikawa, President, American Dream, Inc., Coordinator of the exchange in Japan*



Trish Donoghue presenting President Dr. Noriyoshi Taguchi and Vice President Onari Kiyoshi M.D., Ph.D. of Fukuyama Heisei University with a certificate to mark the 5th anniversary of the program.

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## Does supinator play a role in lateral elbow tendinopathy?



### APA Sports Physiotherapist Jim Mack examines the motor control mechanisms of the elbow.

What do we know about motor control of the elbow? The article by Coombes et al. (2009) on an integrative model of lateral epicondylagia proposed three interrelated components in our understanding of the condition: (1) local pathology, (2) pain system changes, and (3) motor system impairments. Their article presented an excellent review of the literature in these areas.

### “While studies support the use of eccentric training, it has not been shown to be superior to concentric/eccentric training...”

In the area of motor control, reduction of pain-free grip, strength and activation deficits of the flexors and extensors and the upper limb in general, muscle morphological changes and sensorimotor changes, which can be bilateral, have been demonstrated.

There are reports of significant strength imbalances in the dominant arm of elite baseball pitchers and tennis players with a 15–30 per cent increase in isokinetic wrist flexor/pronator strength, but not extensor/supinators. In tennis players, dominant arm wrist flexor, extensor and pronator strength

is increased by 10–25 per cent but not supination (Ellenbecker et al. 2010). These authors suggested this is a necessary imbalance for optimal performance and that this imbalance should be regained in rehabilitation post-injury.

The recent focus on dynamic rehabilitation for lateral elbow tendinopathy has been on eccentric exercise. While studies support the use of eccentric training, it has not been shown to be superior to concentric/eccentric training (Andres & Murrell 2008, Coombes et al. 2009, Malliaris et al. 2008). The rationale for eccentric exercise has more to do with local pathology than motor system changes.

Vicenzino (2003) and Bisset et al. (2006) outlined a program of general upper limb conditioning, mobilisation with movement (MWM) lateral glide and pain-free grip, radiohumeral mobilisation, taping and addressing proximal impairments. Bisset et al. (2006) showed this program to be superior to corticosteroid injection at 52 weeks, and wait-and-see at six weeks. The program included concentric/eccentric extensor and pronation/supination strengthening.

### “More specific research... is needed to better understand the motor control mechanisms of the elbow and to enhance exercise programs.”

In 1997 I presented the results of a simple clinical trial of 16 patients who underwent a program developed by Helen Burfield and myself, which focused on restoring dynamic stability to the lateral elbow. Figure 1 illustrates changes in 14 patients with a recent tennis elbow over six weeks, from an average self-rating of 30 per cent to an average 83 per cent at discharge (100 per cent being normal).

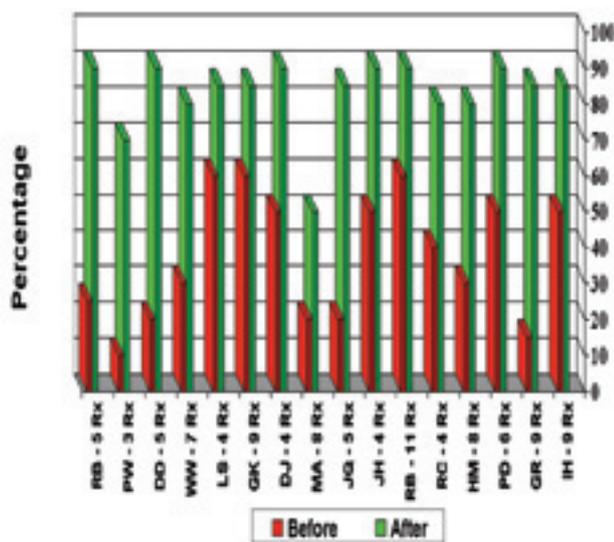


Figure 1. Mack and Burfield clinical trial 1997. Changes in self-rating (100 per cent being normal).

The passive structures (lateral collateral ligaments, capsule and bony articulation) offer little resistance to varus and distraction in the extended position (Ellenbecker & Mattalino 1997).

We focused in particular on the possible role of supinator, suggested by Stroyan and Wilk in 1993, in the stability of the radiohumeral and superior radioulnar joints. Supinator is the deepest muscle in the proximal radius. It is a broad, oblique and single joint. It has a more superficial attachment to the lateral epicondyle and lateral ligament and a deeper origin on the supinator crest of the ulna. It wraps around the proximal radius and has an intimate attachment to the annular ligament. It is therefore ideally placed to stabilise the radiohumeral and radioulnar joints statically and eccentrically in gripping and lifting tasks in pronation. The extensors, anconeus, biceps and triceps can also compress the lateral elbow. Biceps can control pronation but is insufficient at end-range extension where the lateral elbow tendinopathy problems generally occur. In this position there is a mechanical disadvantage to stress

overload due to the medial sloping lateral epicondyle, which creates a fulcrum over the prominent radial head (Ellenbecker & Mattalino 1997).

Bozkurt et al. (2005) found the deeper fibres of supinator attached to a synovial fold of annular ligament between the head of radius and capitellum, which the authors proposed may prevent compression of the synovial fold in pronation and restore its position in supination. Apart from some anatomical studies, there is scant interest in the literature in the motor control role of supinator. The main interest is whether it should be surgically released along with extensor carpi radialis brevis and extensor digitorum communis in recalcitrant tennis elbow, and the supinator's role in the entrapment of the posterior interosseus nerve (Erak et al. 2004).

**“It is not until there is good control of pronation and improved functional pain-free grip strength that eccentric/concentric extensor, flexor strength is included.”**

Clinically, shortening of the flexor pronator muscles is almost always found on the symptomatic side in lateral elbow tendinopathy. Interestingly, we have also found this shortening in the symptomatic side in medial elbow tendinopathy, medial thrower's elbow problems and even overuse wrist problems such as carpal tunnel and ulnar instability/compression. This fits with the concept of strength imbalances shown in trained throwers and tennis players. Michael Waters (2005), in an honours project on a single case study, found the wall flexibility test for flexor pronators that we have used clinically to have an intratester reliability of 0.99 (ICC 1, 1). This test is described in Figure 2.

Our program focuses initially on stretching and soft tissue release of flexor pronators using the wall, as in Figure 2, but keeping the palm fully on the wall. The tighter hand needs to be lower on the wall. Stretching of extensors may be delayed if painful, but soft tissue release can be done on day 1 to unload the origin. Passive mobilisation of the head of the radius can also be done on day 1 in most cases utilising an AP, lateral glide and supination direction. This allows the radial head to move more easily into its stable supinated close-pack position. The olecranon compresses laterally with excessive pronation as well as posteromedially in extension due to accessory abduction. Mobilising and releasing these areas assist in regaining ulnarhumeral restrictions. Taping or a rotational elasticised brace is used to help stabilise the lateral elbow and unload the extensor origin (Figure 3).

A lateral glide localised to the head of radius is used while practising bringing the hand down into a functional grip lift position (Figure 4). This can initially be done pain-free using a ruler and progression can be made to a heavier weight such as a dumbbell or hammer. Pain-free grip is included once adequate control of forearm pronation is achieved, usually after two to three weeks. A flexed position of the elbow is used to reduce tensile and compression forces on the common extensor origin. Extensor carpi radialis brevis and extensor digitorum communis as well as the superficial head of supinator have been shown to exert the most tensile force on the lateral epicondyle (Erak et al. 2004).



Figure 2. The symptomatic right arm displays shortening of flexor pronator muscles. A reliable measurement can be made by asking the patient to start with the hands lower down on the wall, keeping the elbow crease and wrist parallel to the floor and middle finger vertical to the floor, and moving the hand up the wall as far as possible, keeping the palm fully in contact with the wall. The measurement is taken from the pisiform to the floor.



Figure 3: (above left) Taping is used to supinate, laterally glide and compress the radiohumeral joint; (above right) a custom-made elasticised brace is an alternative to taping and can be used in the long term.

## Vox pop

At the recent ACSMS 2011 Conference SMA asked conference delegates their opinions on the following question:

### What are some of the gaps within your profession?

“As I live in regional Victoria, access to professional development is difficult.”

*John Cooney, Physiotherapist, VIC*

“There is: relative lack of training in musculoskeletal/ sports medicine compared with other disciplines e.g. physio; significant time constraints; and limited ability to properly assess and manage sports medicine/ musculoskeletal problems especially if there is a second or third problem in a consultation.”

*John Manderson, General Practitioner, VIC*

“There is a lack of communication/braining storming among the profession regarding issues in the community.”

*Lionel C Lim, Sports Doctor, WA*

“Within the profession of exercise physiology, there is too little consensus on almost all academic content; wandering accreditation guidelines from NUCAP with ESSA; too little cooperation between ESSA and SMA; and there is a need for an exercise physiology working group that spans ESSA and SMA.”

*Robert Robergs, Professor, NSW*

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Figure 4: (above left) Lateral glide of head of radius while eccentrically controlling pronation; (above right) pain-free gripping with lateral glide of head of radius.

It is not until there is good control of pronation and improved functional pain-free grip strength that eccentric/concentric extensor, flexor strength is included. The cervicothoracic, shoulder and neural structures are examined early and appropriate treatment given in conjunction with elbow management. General arm strengthening, addressing proximal biomechanics and posture, is included as early as possible with care not to aggravate lateral elbow pain on gripping. Time frames vary with severity and pain system changes, but generally patients are advised that progress can be gradual over several months.

Medial elbow tendinopathy is treated with a very similar program. The emphasis is on achieving supination and pronation strength with more general lateral glide just distal to the elbow joint and avoiding a valgus position in supination. We have observed that when supination is restricted by flexor pronator tightness or intra-articular changes, a more valgus position is used when turning into supination. This would likely traction the flexor origin and ulnar nerve.

Elements of this program are also used for thrower's elbow problems, overuse forearm myofascial pain and tendinopathies and wrist problems, in particular ulnar wrist abutment such as triangular fibrocartilage complex injuries.

In their 2009 review, Coombes et al. stated that the most effective exercise protocols in treating lateral elbow tendinopathy

are not clearly established. More specific research—as has been done in the lumbopelvic region, shoulder and knee—is needed to better understand the motor control mechanisms of the elbow and to enhance exercise programs.

**“Clinically, shortening of the flexor pronator muscles is almost always found on the symptomatic side in lateral elbow tendinopathy. ...we have also found this shortening in the symptomatic side in medial elbow tendinopathy, medial thrower's elbow problems and even overuse wrist problems such as carpal tunnel and ulnar instability/compression.”**

**Jim Mack**

Jim Mack completed his Masters in Sports Physiotherapy in 1993. He was National Chairman of Sports Physiotherapy Australia from 1998 to 2000 and presided over the period when the APA titling process for Sports Physiotherapy was initially formalised. He is a partner at Adelaide Sports Physiotherapy and is a casual lecturer and tutor on the master's program at the University of South Australia. His special interests are the elbow and foot.

References, as indicated within the article, are available at [sma.org.au/publications/sport-health/](http://sma.org.au/publications/sport-health/)

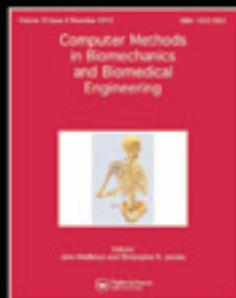


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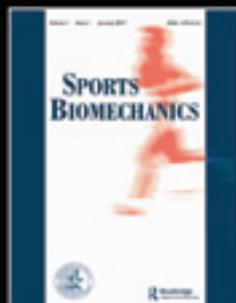
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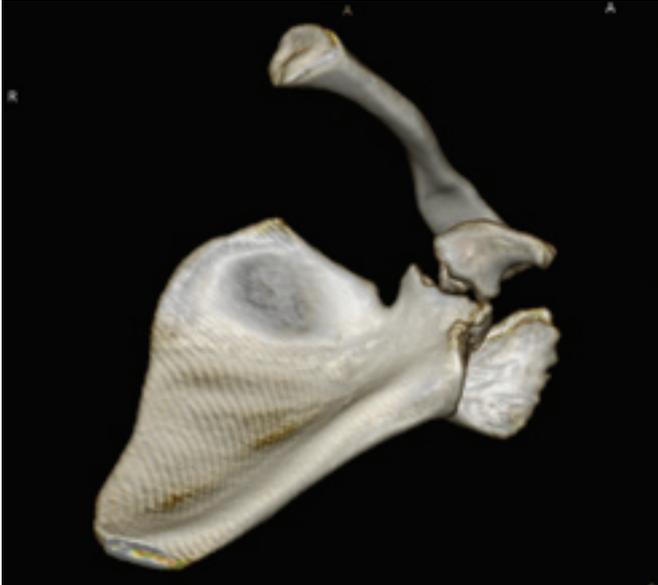
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## Appropriate use of diagnostic imaging in sports medicine



Left: High-tech imaging is becoming more affordable and more readily available. Right: Plain x-ray is often the only imaging required.

**Australasian College of Sports Physicians (ACSP) President, Dr David Hughes highlights that with medical imaging becoming more affordable and more readily available health practitioners must ensure that they have the appropriate training to make informed decisions about the efficacy and safety of such medical imaging in specific clinical scenarios.**

When I first started practising sports medicine in 1992, there was no MRI machine in Canberra. Patients requiring an MRI had to travel to Sydney and could be expected to part with about \$1,000 (a lot of money in those days) for the privilege. Technological advances have meant that the number of MRI machines operating in Australia has increased considerably. It has also meant that the average fee charged per imaging service has decreased significantly. However, only a portion of MRI machines are 'licensed' by the Australian Government as being eligible for a Medicare rebate. In recent years, those radiology practices that have a non-licensed MRI machine have tended to reduce their prices to ensure that the out of pocket gap is not significantly different for a scan performed on an unlicensed machine, relative to that performed on a licensed machine. In summary, an individual undergoing standard MRI of the knee can now generally expect to be out of pocket around \$200–\$300.

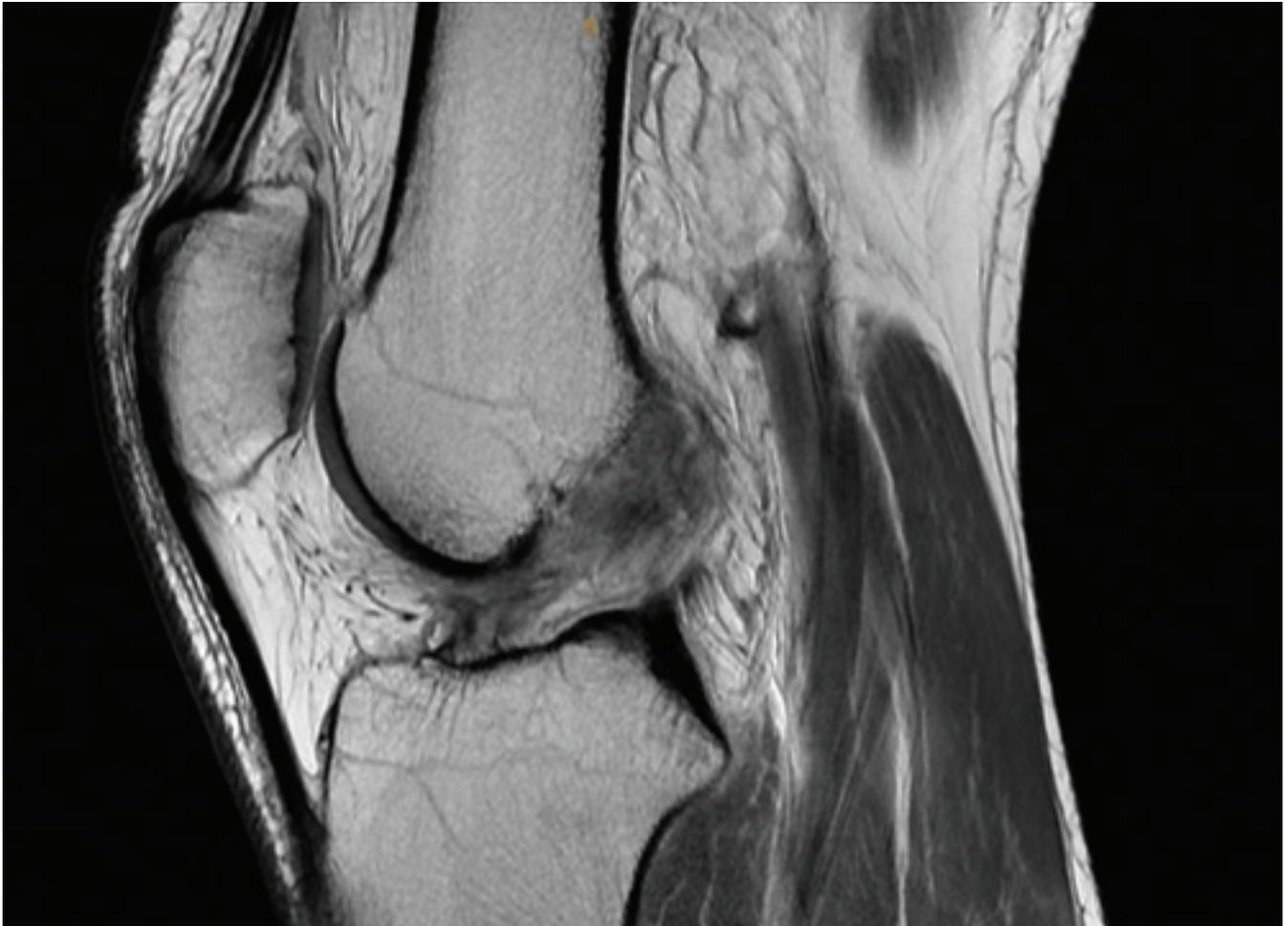
The fact that there are many more unlicensed than licensed machines means that Medicare has no involvement in many MRI scans performed. In order to access the Medicare rebate on a licensed machine, a patient needs to have a referral written by a recognised specialist. Patients referred for an MRI by an SEM Physician can access the Medicare

rebate whereas those patients with a referral from a general practitioner or an allied health practitioner (physiotherapist, podiatrist, chiropractor, osteopath) do not receive the Medicare rebate.

**“Performing MRI on patients without a clear diagnostic indication can lead to excessive and unnecessary intervention for patients.”**

Most SEM Physicians that I speak with agree that they have noticed a significant increase in the number of patients presenting with diagnostic imaging films that have been ordered by allied health practitioners. Such medical imaging, in my experience, has included plain x-ray, ultrasound, CT, MRI and on one occasion, a nuclear medicine bone scan. While referrals from allied health practitioners may not in certain circumstances attract a Medicare rebate, the decreasing cost associated with medical imaging has meant that patients are often happy to pay the out-of-pocket expense and not worry about the Medicare rebate, for the sake of convenience.

This raises the issues of safety and efficacy in the use of medical imaging. The advanced training program of the Australasian College of Sports Physicians (ACSP) dedicates a great deal of time and effort instructing Registrars regarding the appropriate use of medical imaging referral. Appropriate use of medical imaging involves issues far beyond cost. Health practitioners should not presume to order medical imaging unless they have received specific training relating to the efficacious and safe use of such imaging.



MRI is an appropriate first line modality where soft tissue injury is clinically suspected.

**“...medical imaging is no substitute for careful history taking and thorough physical examination.”**

To utilise medical imaging in an appropriate fashion, the referring practitioner must have a good understanding of which medical imaging modality will provide the most useful information when suspecting a particular condition. An example is the patient who presents with symptoms and signs which are clinically suggestive of advanced osteoarthritis in the weight-bearing compartments of the knee. An MRI would confirm the existence of osteoarthritis but is highly unlikely to be useful in the ongoing management of the patient. Weight-bearing plain x-ray would be the most appropriate form of investigation in this setting, providing the practitioner with information regarding the loss of joint space, associated degenerative changes and alteration of alignment. The practitioner will in most cases be able to make a judgement as to whether persistence with conservative

treatment is appropriate or not. In the event that the condition is deemed to require arthroplasty, an orthopaedic surgeon would prefer to see a weight-bearing plain x-ray than an MRI in planning the surgical intervention.

Similarly, in many bony fractures, an MRI might be able to confirm the fracture but a plain x-ray will also do this and will provide more useful information in terms of alignment, comminution and other factors which will govern treatment decisions.

Conversely, where the history and clinical examination strongly suggests acute disruption of one or more of the major ligaments of the knee, MRI is an appropriate first line of investigation. MRI will provide the information required regarding the ligamentous and other soft tissue structures of the knee. If the MRI indicates coexisting bony injury, the practitioner can make a judgement as to whether there is an indication for further plain x-ray or CT imaging.

As high-end medical imaging becomes more affordable and more readily available, there is a tendency to rely on medical imaging when assessing a condition and when formulating a management plan. Patients themselves will sometimes present with an expectation that medical imaging is required in the assessment of a particular condition. All health practitioners should remember that medical imaging is no substitute for careful history taking and thorough physical examination. It is the findings of the history and physical examination which should inform the need or otherwise for medical imaging, and not vice versa.

**“An MRI should not be performed as part of a ‘diagnostic fishing expedition’.”**

Safety is very pertinent in the appropriate use of medical imaging. Medical imaging is the main source of man-made exposure to ionising radiation in most Western countries. Exposure to ionising radiation carries a risk in the long term of malignancy and genetic damage. Quantification of that risk is difficult and debatable. Suffice to say, exposure to ionising radiation should be kept to a minimum. Some published papers have suggested that up to a third of radiological investigations are partially or totally inappropriate (Picano 2004). Unnecessary or inappropriate examinations expose patients to risk without benefit and are a threat to the effective allocation of resources (Mendelson 2007). Practitioners referring patients for medical imaging must ensure that the investigation is clinically required, has the potential to alter clinical management and will minimise exposure to ionising radiation while delivering the required information.

**“Appropriate use of medical imaging involves issues far beyond cost.”**

Particular patient subgroups require special consideration when ordering medical imaging. Females have a slightly increased risk of adverse results from exposure to ionising radiation, compared with males. Children, because of the greater number of rapidly dividing cells and the greater life expectancy, are at higher risk of adverse outcome from exposure to ionising radiation than adults. Any exposure to ionising radiation in children must be carefully considered and potential benefits weighed against potential risks. All females of weight-bearing age should be asked whether they could possibly be pregnant before referral for imaging which involves exposure to ionising radiation.

It is not sufficient to say that MRI provides no radiation therefore no harm can be done. An MRI should not be performed as part

of a ‘diagnostic fishing expedition’. MRI has the potential to deliver a high level of false-positive results, revealing ‘pathology’ that has nothing to do with the patient’s symptoms. The detection of a spurious ‘abnormality’ can have serious consequences for the patient, potentially leading to unnecessary interventions.

A recent study involving MRI of asymptomatic hips in professional hockey players in North America showed that 56 per cent of these asymptomatic individuals were reported as having ‘labral tears’ by more than one radiologist specialising in musculoskeletal imaging (Silvis 2011). Obviously as these research subjects were asymptomatic, no intervention was required in relation to the MRI findings. Had one of these patients presented with groin pain however, they may well have undergone hip arthroscopy on the presumption that the labral tear was the cause of their groin pain. Performing MRI on patients without a clear diagnostic indication can lead to excessive and unnecessary intervention for patients.

**“As high-end medical imaging becomes more affordable and more readily available, there is a tendency to rely on medical imaging when assessing a condition and when formulating a management plan.”**



Medical imaging is not required unless it is going to alter the clinical management.

Lovell and co-workers (Lovell 2006) demonstrated that substantial amounts of bone marrow oedema at the pubic symphysis can occur in asymptomatic elite junior soccer players, but such oedema is only weakly related to the development of osteitis pubis. Elite athletes who are diagnosed with osteitis pubis are often stood down from vigorous sporting activity for significant periods of time. Relying on medical imaging alone to make such a diagnosis is inappropriate and could result in an elite athlete missing a significant amount of playing and training time unnecessarily.

**“The fact that there are many more unlicensed than licensed machines means that Medicare has no involvement in many MRI scans performed.”**

Health practitioners can understandably feel under pressure to refer for medical imaging in order to defray medicolegal risk. There is a perceived disconnect (accurate or otherwise) between judgements made in court rooms and evidence-based clinical decision-making, including decisions over whether to order medical investigations. The key to solving this dilemma lies in education and appropriate medical record-keeping.

All health practitioners who presume to order medical imaging must be familiar with the evidence-based guidelines which indicate the need or otherwise for medical imaging in particular clinical situations. Health practitioners must maintain medical records which articulate the information upon which they based their decision to refer or not refer for medical imaging. Applying evidence-based guidelines to decision-making and maintaining accurate medical records will provide the dual benefits of ensuring patients are not needlessly exposed to ionising radiation and decreasing medicolegal risk to the health practitioner.



Medical imaging is not a substitute for a detailed history and thorough physical examination.

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Using MRI for a 'diagnostic fishing expedition' is bad medical practice and dangerous.

In summary, medical imaging across a range of modalities is becoming more affordable and more readily available for patients. Health practitioners can experience pressure from patients and from their own desire to minimise medicolegal risk, to refer patients for medical imaging. However, health practitioners who refer patients for medical imaging must ensure that they have appropriate training to make informed decisions about the efficacy

and safety of such medical imaging in specific clinical scenarios. Medical imaging is not a substitute for taking a detailed history or performing a thorough physical examination.

**Dr David Hughes**

President

Australasian College of Sports Physicians

References, as indicated within the article, are available at [sma.org.au/publications/sport-health/](http://sma.org.au/publications/sport-health/)

## Discipline group news and events

### Australasian College of Sports Physicians (ACSP)

#### News:

#### ■ Change of address

ACSP has recently relocated to Hobart, Tasmania. Please note the new contact details:

Suite1, Level 2, 13–17 Castray Esplanade,  
Battery Point, TAS 7004 Australia  
Phone +61 3 6224 4449 or 0800 22 777 8  
(from NZ only)

Fax +61 3 6224 4456

Email [acsp@bigpond.com](mailto:acsp@bigpond.com)

#### ■ Call for membership

ACSP is the professional body representing, training and assessing Sport and Exercise Medicine (SEM) Physicians in Australia and NZ. Associate Membership is open to all registered medical practitioners with an interest in the field of SEM and applications are now invited. Benefits include:

- Weekly news bulletins
- Sport and exercise medicine journals
- MOPS
- Professional education activities
- Collaborative research opportunities
- Discounted conference registration
- Opportunity for collegial interaction

Applications for Associate Membership forms can be obtained by contacting the College as per above.

#### Upcoming events:

- ACSP Clinical Sports Medicine 2012: Upper Limb  
March 4, 2012  
Sydney, NSW

*To be confirmed shortly*

For more information visit [www.acsp.org.au](http://www.acsp.org.au)

### Australian Psychological Society (APS) College of Sport and Exercise Psychologists (CoSEP)

#### News:

- The APS CoSEP held their AGM on October 7, 2011 in Canberra – at the annual APS conference. A CoSEP themed day was held that included the AGM in addition to a range of paper presentations and forums.
- A National Athlete Counselling Support Network has been launched by the National Institute Network (NIN) across Australia. Its focus is supporting athletes preparing for the 2012 London Olympics and Paralympics – for further details please contact your local State Sporting Institute/Academy.

For more information visit [www.psychology.org.au](http://www.psychology.org.au)

### Exercise & Sports Science Australia (ESSA)

#### Upcoming events:

- **Research to Practice**  
**5th Exercise & Sports Science Australia Conference and 7th Sports Dietitians update**

Jupiters Casino, Gold Coast, Queensland  
April 19–21, 2012

**Keynote speakers:** Professor Tim Noakes, Professor Romain Meeusen, Professor Peter Brubaker, Dr Roanne Segal and Australia's own Professor Robert Newton will deliver the Frank Cotton Memorial Lecture.

For more information visit  
<http://www.essa.org.au/conference2012>  
or follow us on Twitter @conference2012

For more information visit [www.essa.org.au](http://www.essa.org.au)

## Sports Dietitians Australia (SDA)

### News:

- Registrations are now open for our highly regarded 4-day Sports Nutrition Course in Canberra, and places are filling fast in our popular Nutrition for Exercise and Sport Course, across Australia. More information can be found on our website [www.sportsdietitians.com.au](http://www.sportsdietitians.com.au) or follow us on Twitter @SportsDietAust.

### Upcoming events:

#### March

- 3** Nutrition for Exercise & Sport Course – Queensland (Brisbane)
- Nutrition for Exercise & Sport Course – Western Australia (Perth)
- 10** Nutrition for Exercise & Sport Course – South Australia (Adelaide)

#### April

- 19–21** ESSA/SDA Conference – Gold Coast, Queensland

#### May

- 4–7** Sports Nutrition Course – Canberra (AIS)
- 19** Nutrition for Exercise & Sport Course – Victoria (Melbourne)
- 26** Nutrition for Exercise & Sport Course – New South Wales (Sydney)

#### June

- 16** Nutrition for Exercise & Sport Course – ACT (Canberra)

For more information visit [www.sportsdietitians.com.au](http://www.sportsdietitians.com.au)

## Sports Doctors Australia (SDrA)

### News:

- At the recent SDrA Teleconference (December 12, 2011) plans were put into place to have a major medical contribution at the be active 2012 conference (October 31 – November 3, 2012), including the very popular hands-on Sports Medicine Emergency Course led by Associate Professor Shane Brun.

### Upcoming events:

- SDrA Fellow, Dr Neville Blomeley, is the Chair of the National Faculty of Special Interest (NFSI) Sports Medicine Network, being developed by the Royal Australian College of General Practitioners (RACGP). A further NFSI Teleconference is planned for February and Dr Blomeley is developing a 'forum' for discussion of sports medicine cases, requesting/inviting commentary by other members of the network.

For more information visit [www.sportsdoctors.com.au](http://www.sportsdoctors.com.au)

## Sports Physiotherapy Australia (SPA)

### News:

- Planning is underway for the 2012 ACSP SPA Workshop to be held in Melbourne on April 20–21, 2012. The theme is 'Injury Prevention' and will be held for members of ACSP and Titled Members of SPA. This follows on from the very successful workshop held in Canberra in 2010. Speakers will include leaders in the field of injury prevention.

For more information visit [www.physiotherapy.asn.au](http://www.physiotherapy.asn.au)



## SPORTS INJURY FACT SHEETS

*Sports Medicine Australia members can now display valuable sports injury prevention and management resources within their practice and even customise them with their own address and contact details.*



**For more information or for an order form visit <http://sma.org.au>**

## The Journal of Science and Medicine in Sport

### The role of music in sport

**Recently Grant Schofield, JSAMS Associate Editor, conducted a podcast with Professor Peter Terry regarding his latest study which looks at the role of music in sport and exercise and how it can affect performance and motivation.**

Professor Peter Terry's study, titled *Effects of synchronous music on treadmill running among elite triathletes* which features in Volume 15 Issue 1 January 2012 of *The Journal of Science and Medicine in Sport* looks at the potential benefits of music amongst triathletes. Their perceived exertion, lactate, Vo<sub>2</sub>, moods before and after, feelings and time to exhaustion were assessed with two different types of music: silence and music which matched their stride rate (the study looked at two kinds: motivational music and neutral music).

#### Main findings

- Triathletes ran for longer to exhaustion with both types of music as compared to no music.
- Triathletes enjoyed running more while listening to motivational music as compared to the other kinds (silence and neutral music). Even though the neutral music kept them running for longer they didn't enjoy it!
- Psychological benefits require motivational music.
- Running economy is better while listening to music as compared to listening to no music.
- Mood changes are less negative when listening to motivational music.

This study shows that music in sport can certainly affect performance and motivation. It is therefore crucial in sport where music is allowed that the music is chosen carefully.

#### Tips to choosing the right music

- Match the music to your activity and the psychological effect you want to experience, (e.g. loud, fast, rhythmical, bass-driven music is great for psyching yourself up before interval training).
- Consider the intensity of the activity – you will need faster music if you are running at a faster pace.

- Consider music that creates motivating images in your mind. It may be used to associate with popular culture such as the film Rocky or to personal memories.
- Match the tempo of the music to your expected heart rate during your training session.
- Choose music that contains positive affirmations of running such as 'keep on running' or 'work your body'. Positive statements such as 'moving on up' or 'I believe' can also have a motivating effect.

**Listen to the 'Music and sport' podcast and/or view the research paper, *Effects of synchronous music on treadmill running among elite triathletes* at [jsams.org](http://jsams.org)**



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