

sport health

VOLUME 28 • ISSUE 2 • WINTER 2010



Salary cap Storm, the ALP's health plan and surgeons great and small • Injury Report 2009: Australian Football League • Where are they now? A snapshot look at the recipients of the Australian Sports Medicine Federation Fellow's Awards • The training of a Sport and Exercise Physician
• The female pelvic floor in women's artistic gymnastics • Awful tooth about sports drinks

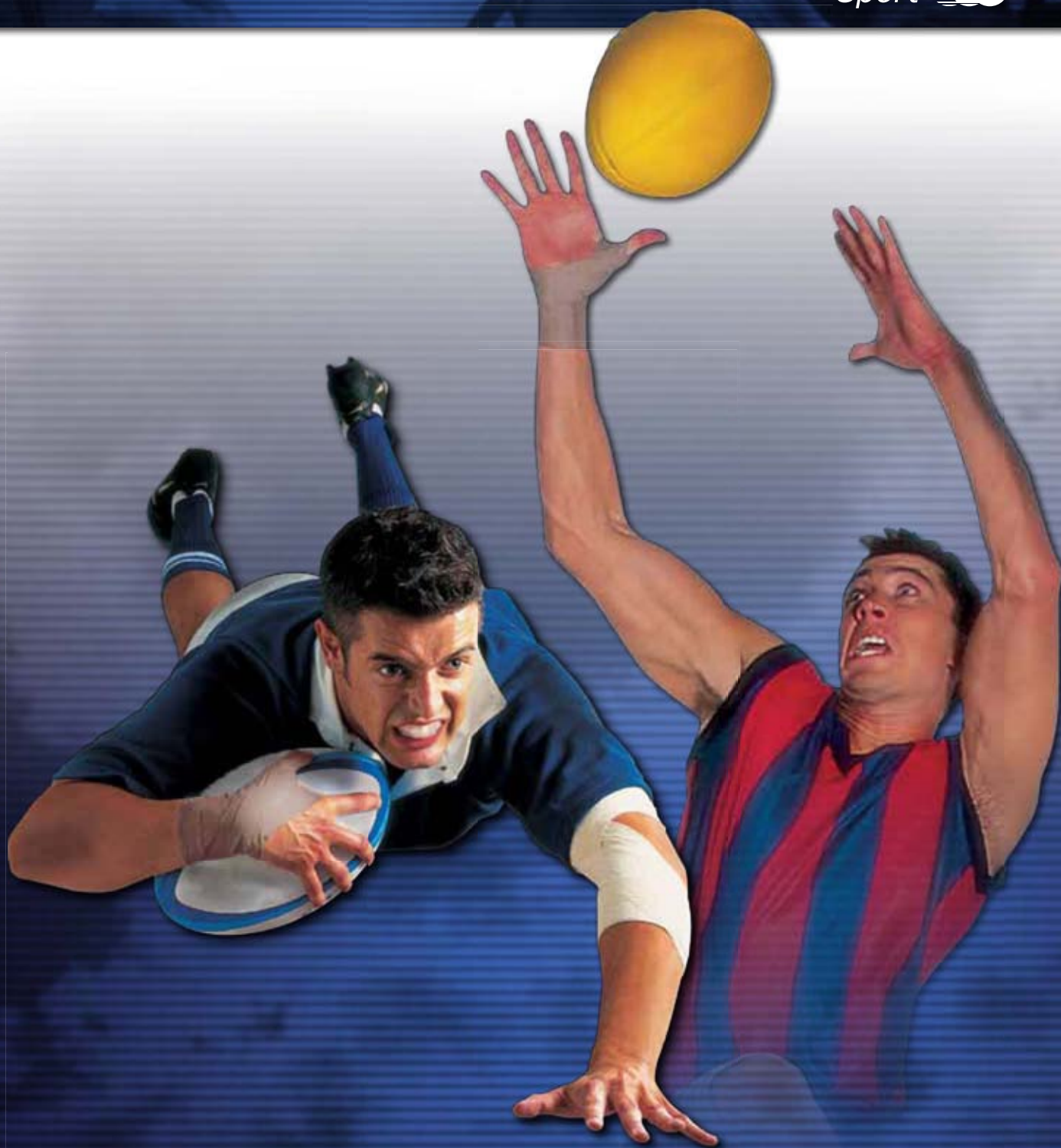


[DEFY YOUR LIMITS WITH ELASTOPLAST SPORT]

[DEFY INJURY. DEFY OPPONENTS. DEFY GRAVITY]

Elastoplast®

Sport 



Prevention is better than cure so protect yourself against injury with the Elastoplast Sport range of sports medicine products. Exclusively used by The Australian Institute of Sport and many other elite sports clubs across Australia and New Zealand.

- Rigid Strapping Tapes
- Elastic Adhesive Bandages
- Mouthguards
- Hot/Cold Packs

For all your Sports Medicine needs. Available from pharmacy, sports medicine wholesalers and supermarkets.

OFFICIAL SUPPLIER



AUSTRALIAN
INSTITUTE OF SPORT*

MAJOR SPONSOR



SAFER SPORT PROGRAMME

BDF ●●●●●
Beiersdorf

© = Reg. tm. Beiersdorf AG Hamburg
* A division of the Australian Sports Commission.

Customer Service 1800 269 933
Customer Enquiries 1800 103 023
www.elastoplastsport.com.au



Opinions expressed throughout this magazine are the contributors own and do not necessarily reflect the views or policy of Sports Medicine Australia (SMA). Members and readers are advised that SMA cannot be held responsible for the accuracy of statements made in advertisements nor the quality or the goods or services advertised. All materials copyright. On acceptance of an article for publication, copyright passes to the publisher.

Publisher

Sports Medicine Australia
PO Box 78 Mitchell ACT 2911
www.sma.org.au

Circulation: 4000
ISSN No. 1032-5662

Editors

John Orchard & Cristina Caperchione

Managing Editor

Amanda Wilson

Chief Executive Officer

Nello Marino

Subscription Manager

Brigid Doherty

Advertising Manager

Amanda Wilson

Design/Typesetting

Papercut

SMA STATE BRANCHES

ACT

ACT Sports House
100 Maitland St Hackett ACT 2602
T (02) 6247 5115

New South Wales

PO Box 3176 Rhodes NSW 2138
T (02) 8116 9815

Northern Territory

PO Box 2331 Darwin NT 0801
T (08) 8981 5362

Queensland

Sports House 150 Caxton St Milton QLD 4064
T (07) 3367 2700

South Australia

PO Box 219 Brooklyn Park SA 5025
T (08) 8234 6369

Victoria & Tasmania

Sports House
375 Albert Road South Melbourne VIC 3205
T (03) 9674 8777

Western Australia

PO Box 57 Claremont WA 6010
T (08) 9285 8033

SUBSCRIPTION RATES

Australia A\$35
Overseas A\$50

SMA members receive *Sport Health* as part of their membership fee

Single copies and back copies A\$15 (includes postage)

PP No. 226480/00028

For subscriptions contact
T (02) 8116 9815

E members@sma.org.au

Cover photograph – www.istockphoto.com

Content photographs – www.istockphoto.com

From Toronto with love	2
The International Congress on Physical Activity and Public Health in Toronto (ICPAPH 2010): progresses in the physical activity and health field.	
Nello Marino	
5 minutes with... Tim Pain, Podiatrist and SMA National President	4
Salary cap Storm, the ALP's health plan and surgeons great and small	5
What to do about endemic corruption if you are in the position of bystander, potential whistleblower or regulatory body.	
Dr J	
Injury Report 2009: Australian Football League	10
18th annual AFL Injury Report containing injury data from the 2009 season.	
Associate Professor John Orchard and Dr Hugh Seward	
Where are they now?	20
A snapshot look at the recipients of the Australian Sports Medicine Federation Fellow's Awards.	
Cristina Caperchione	
ACSMS 2010	22
Details on speakers, the program and how to register.	
The training of a Sport and Exercise Physician	28
A look at the training program run and administered by the Australasian College of Sports Physicians.	
Dr Steve Reid	
The female pelvic floor in women's artistic gymnastics	32
Pelvic floor dysfunction is experienced by gymnasts as evidenced by stress urinary incontinence.	
Keren Faulkner	
Discipline group news and events	34
What's happening over the next few months.	
<i>Journal of Science and Medicine in Sport</i>	37
Top 10 downloaded articles and podcast details.	
Awful tooth about sports drinks	38
Complicated, lengthy and expensive dental treatment can result from frequent and excessive consumption of sports drinks, bottled water, fruit juices and sports gels.	
John Banky	

From Toronto with love



Nello Marino is pictured with the Toronto Charter for Physical Activity promotional fan (distributed at ICPAPH 2010).

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

I was fortunate to have recently attended the 3rd International Congress on Physical Activity and Public Health in Toronto (ICPAPH 2010). Attended by over 1,200 delegates from over 43 countries, the event is one of the international highlights of the physical activity and health promotion calendar and is now well entrenched as a regular worldwide event. This comes following very humble beginnings of conference development by ISPAH (The International Society for Physical Activity and Health).

ICPAPH 2010 follows highly successful ICPAPH congresses staged in Amsterdam (2008) and Atlanta (2006) and continues to build momentum as a truly international congress of note in terms of physical activity and health.

In addition to a wonderful international contingent, including some of the doyens of the physical activity and health field, Australia was very well represented with presentations from some of our finest physical activity researchers and practitioners including Wendy Brown, Adrian Bauman, David Dunstan, Fiona Bull, Neville Owen, Trevor Shilton and

Jo Salmon, who delivered one of the congress' four fabulous keynote presentations (apologies to the many other Australians who were also in attendance).

Whilst it is evident that there has been enormous progress made in the field, one of the major challenges continues to be accuracy and reliability in measurement of activity levels. I suppose the adage 'if you can't measure it you can't own it' really applies here. The reliable measurement of physical activity levels, sedentary behaviour and food consumption is still one of the greatest challenges facing the field. Whilst there is a great level of sophistication being shown, the issue of reliability, compliance through convenience and applicability of technology are still barriers impacting on the capacity to get truly accurate assessments of participant activity in 'everyday' settings.

A number of sessions at ICPAPH were dedicated to the development of devices to reliably record activity and consumption and like the entire field of technology, this is moving at a very rapid rate.

What is evident in the area of technology and physical activity is the likelihood of mobile phones, in particular the smart phones such as the iPhone, playing a very strong role in the measurement of physical activity levels into the future. Naturally there is a great sense of irony in this when we consider that the use of technology has probably been the key reason for decreases in physical activity levels over a number of years. This was indicated quite eloquently by Tim Church at ICPAPH 2010 who suggested that the decrease in manufacturing jobs and the increase in service industries had significantly decreased the calorific expenditure of men and women and has had a direct impact upon weight gain and population obesity levels.

Sadly we've even got to the stage where some consider that the activities of tennis, golf or yoga through technology such as the Wii are replacements for the real thing. Granted I am aware of a number of people that have raised a sweat while boxing using the Wii, but in the main I am yet to be convinced and products such as these, like most 'exercise equipment' in the home, remain a wonderful dust gathering device. But this is a discussion for another issue of *Sport Health*.

Devices such as the iPhone will most likely serve to assist in the measurement of activity, as well as in many instances act as a great motivator for people to participate in a similar way in which pedometers have played a great role in encouraging many to walk.

Another wonderful highlight of the event was the launch of the Toronto Charter for Physical Activity: A Global Call for Action.



The Toronto Charter was ratified by delegates at ICPAPH 2010 with overwhelming support for its call to all countries to seek greater political commitment, resources and community action to support health, enhancing physical activity for all. The Charter is available for viewing in the Resources and Links section of the SMA website (sma.org.au) and it will be featured in the next issue through an article with contributions from *Sport Health* Deputy Editor Christina Caperchione, Grant Schofield and *Journal of Science and Medicine in Sport* Editor, Greg Kolt who were also in Toronto.

As you can gather my attendance at ICPAPH 2010 was in part associated with my long held interest and work in the field but my true motive was one of reconnaissance. SMA has been very fortunate to have previously won the right to deliver ICPAPH in Sydney 2012 and my attendance at ICPAPH 2010 served to gain a better understanding of the event and expectations of all event stakeholders including ISPAH.

This is a major coup for Australia and will provide a tremendous opportunity to further add to the current stable of conferences that fall under the Be Active Conference banner. ICPAPH 2012 will join the National Physical Activity Conference, the Australian Conference of Science and Medicine in Sport, and the National Sports Injury Prevention Conference to provide the wide range of practitioners that form part of the SMA membership to collaborate and connect professionally.

ICPAPH 2012 has already got many of the Toronto delegates, and indeed others, licking their lips in anticipation of the opportunity to see some of the world's great architectural and tourist icons in the Sydney Harbour Bridge and the Sydney Opera House, which incidentally combine to create the marketing brand for the 2012 event.

As we approach 2012, more information will be made available about ICPAPH 2012, however in the meantime we look forward to great conferences in Port Douglas QLD, November 4–6, 2010 and the recently announced Fremantle WA, October 19–22, 2011. Visit sma.org.au/events for more information. Alternately you can follow me on twitter for updates on both of these conferences or other activities taking place at SMA.

Nello Marino

Chief Executive Officer
Sports Medicine Australia

nello.marino@sma.org.au
Follow me @smaceo

5 mins with... Tim Pain, Podiatrist and SMA National President



How many years have you been in podiatry?

17 years. I graduated from the University of SA in 1993, worked in rural Victoria before moving to Tasmania in 1995.

Where do you work?

I am in private practice in Hobart. In 2008, I constructed a purpose built podiatry clinic to fulfil a vision to practice in a podiatry specific environment unconstrained by existing infrastructure limitations.

What does your typical day consist of?

We have two young children so the day starts pretty early. I usually walk to and from work. Most of the day is spent consulting patients with the occasional meeting via phone hook-up during the day. Arrive home and spend some time with Rupert and Isabelle before bed, then usually relax or do a bit of paperwork.

What is your favourite aspect of your job?

There is always something very satisfying in making a diagnosis for a patient who has a longstanding chronic problem.

What has been the highlight of your career?

2006 Commonwealth Games medical coverage.

How did you become involved with SMA?

I joined to gain more professional knowledge of not just my own field but to also better understand what

other professions were able to provide. This helped me establish a strong referral network early in my career.

Why and how did you become President?

I have been involved on a State or National SMA Board almost from the time I became an SMA member in 1995. I became President for many reasons, but the two main reasons are:

1. I always believe that people who actively contribute gain so much more than those who are passively involved.
2. I am a great believer in the SMA Mission and the need to provide every member of the community, the opportunity of exposure to one of the many SMA programs and resources. This can only happen if SMA continues to prosper and develop as an organisation and I want to actively be involved in achieving this.

What are you passionate about?

My family, sea-kayaking and snorkelling.

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

When you make a mistake let it be for something that you have done rather than something you didn't do.

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

God – To see if he turns up.

Sir Edmund Hillary – Mount Everest is simply fascinating.

Warren Buffett – He would have some great financial tips.

Captain James Cook – I have always wanted to know how to tie knots.

Favourites

Travel destination: Varanasi, India

Sport to play/watch: AFL

Cuisine: Indian, nothing like a good Chicken Tikka Masala

Movie: Shawshank Redemption

Song: Before Too Long by Paul Kelly

Book: Shantaram by Gregory David Roberts

Gadget: Mobile phone

Salary cap Storm, the ALP's health plan and surgeons great and small



Australia's biggest sports headline for the year will almost certainly be the salary cap scandal at the Melbourne Storm. And of equal certainty is that the magnitude of the story was not derived by a football team paying players outside the cap (noone was gobsmacked by this) but due to the fact that they were caught and heavily punished. The latter is the most staggering: a News Limited-owned team incurring a scorched-earth punishment from a News Limited-administered competition. On one of the first TV programs I watched on this issue, the host said words to the effect of *'...apparently they were maintaining two sets of books, one detailing the true accounts and a second which they passed onto the authorities. This is standard practice for plumbers and pizza restaurants but we don't expect a football club to get caught doing it.'* I'll shortly get onto similar rorts closer to home.

To start with I was reminded of a story a few years ago about a pharmacist friend of a friend. He was apparently complaining that he was going to have to pay full tax on profits for a couple of years because he was intending to sell and could only maximise the goodwill payment if the official books recorded everything for two financial years. He had become accustomed to avoiding tax on cash sales and was miffed he would have

to sacrifice this privilege for a couple of years for the sake of making even more money in the sale of the business.

The anonymous friend of a friend is going to get a good run in this article, which is the difference between a *Sport Health* column and a front page newspaper article. The central theme of this piece is what to do about endemic corruption if you are in the position of bystander, potential whistleblower or regulatory body. The Melbourne Storm appears to have been hit with a nuclear weapon, but perhaps the NRL administration had no choice when a whistleblower presented unequivocal evidence of repeated infringements that could not be ignored. In this sense they are only as unlucky as Ben Johnson getting pinged for anabolic steroids when he had every reason to think that most of his competitors in the race were also taking them. When one occasional transgressor is given a massive penalty, it must go some way to curbing the extent of abuse, or so you would think. Cynicism becomes rampant though if there is a perception that the vast majority of cheating goes unpunished.

There have been plenty of articles about salary cap abuses in the media over the years. There were even a few floating

around in the weeks before the Storm saga. One was an allegation by a builder/sponsor that he was asked by the Gold Coast Titans to build a free house for Scott Prince. It was a medium size story because there was a player and club named, but without a smoking gun this fizzled when the investigator found no proof. The generic articles alleging that 'almost every club is engaging in salary cap rorting' are small stories by comparison. Perhaps they are true, but even if they are, no one cares unless specific instances are named or, more importantly, proof is provided.

Last year I tossed a few missiles in the direction of segments of the orthopaedic surgery profession. Of course if I don't name anyone specific then these missiles are ripe tomatoes as opposed to grenades. I intend to keep throwing them however, in the hope that I'll eventually inspire someone with more courage and, critically, more first-hand evidence than I have to produce the smoking gun. To add some balance, in the next *Sport Health* issue I'm planning an article about surgery that pays due respect to some of the world-class surgeons we have in Australia. They are justifiably multi-millionaires and I respect both their work and their status. By contrast I detest third-rate surgeons becoming multi-millionaires in Australia on the back of doing shoddy work, simply because it is so easy to rort the system and there are inadequate systemic checks in place.

Let me repeat some of my allegations in a slightly different form. I'll start with something that a doctor friend (that I'll refer to as Dr X) told me recently. Dr X is a physician consultant at a public hospital (and I suspect there will be hundreds who fit the following outline of his profile). His outpatient department is staffed by the registrars, which is fair enough, as it is the public system. What is not fair enough is that the registrars see patients and bill them under Medicare using Dr X's (the consultant's) provider number. This means that the income from the outpatient clinics flow into Dr X's bank account, even though he doesn't attend the clinic. To absolve him from profiteering from work that he didn't do, he then makes a regular 'donation' back to his hospital of the money he shouldn't have even received. I of course asked him why he would let his provider number get used in this fashion when he didn't finish up with any of the money. His answer was that there was a lot of pressure from the hospital to do so. The outpatient clinic wasn't funded by the state government and if Medicare wasn't rorted in this instance they would apparently have to close down the clinic, which would reduce both services to the public and training for the registrars. It is a messy situation and one which many people

would find uncomfortable, but if the administrators told you this was the only way to finance the clinic and that 'every other hospital was doing it' then you might feel justified participating in this system. Ethically you could sleep soundly at night if you were donating the money back to the hospital in full.

This sort of moral hazard has been set up because of the farcical situation where the Federal government funds Medicare and private health insurance and then collects GST money for the states, which it distributes to them to fund public hospitals. The cost of running public hospitals always seems to outstrip inflation, so the hospital administrators feel justified in rorting Medicare to get extra funds for the hospitals, so that they don't have to cut services. An openly endemic culture of one level of government stealing funds from another is a very good justification for the ALP to attempt a merger of the Federal and State health systems, which I hope is successful. If it is done well, it may be the ALP's comparable reform to the GST of the Howard government and will counter criticism that they are 'all talk and no action'.

Some people may think it isn't a big deal to stop the churn of money back and forth between Federal and State health departments, but they probably don't understand the extent of the waste. From my understanding, the worst example of this is the rorting involved with designated private surgical patients being operated on in public hospitals. Cast your mind back to the physician outpatients example I have just provided. Something similar is occurring with respect to surgery in many public hospitals, but the money being squandered is far greater. If a patient admitted to a public hospital needs surgery, quite often it will be the surgical registrar who performs the operation, as opposed to the consultant. The problem starts when it is found that the public hospital patient actually has private health insurance but the consultant surgeon doesn't want to attend. Many public hospitals actually now employ a 'Private Health Insurance Compliance Officer' whose job it is to encourage as many patients as possible to elect to be admitted as a private patient rather than a public one. In some hospitals, the Compliance Officer is even authorised to throw cash at the patient to get them to switch their status from public to private ('....I see your policy has a \$500 excess for every admission. As a goodwill gesture, not only will we ensure that your surgeons don't charge any gaps, but we'll reimburse you \$500 to make sure you haven't been disadvantaged by choosing to become a private patient.') Like the outpatient example I gave before, in order to generate payments from Medicare and the private health funds, a consultant surgeon needs to hand over his or her provider

number to take responsibility for the operation. The Medicare and private hospital fees for the consultant surgeon then go directly into the consultant's bank account and the public hospital gets to bank the even more substantial theatre and bed fees from the private insurer.

Between the public hospital and consultant surgeon this arrangement seems like a win-win. Their role in the scam is a little different however – it is actually the hospital administration which is pushing the practice in order to keep up their funding. But it is the consultant surgeon who is committing the fraud; that is accepting money from Medicare and private health insurers for an operation he or she didn't do. Maybe there are surgeons out there who, like my physician friend Dr X, pay back the money as a donation to the hospital. However, although I don't have the smoking gun proof, I think it is highly likely that there are many surgeons out there who are pocketing the money. There was a report by a state ombudsman in Victoria which seemed to assert that billing for surgery by the consultant (when not in attendance) was rife. A major concern of public hospitals who participate in these practices would be making sure that there are no whistleblowers to detail the fraud, because full public hospital funding is dependent on it persisting. The losers are those of us who have private health insurance and have to face huge fee increases each year, because a component of these fee increases is due to public hospital surgery, done by the registrar, which has been fraudulently called private surgery and billed to the insurers.

I've heard many stories from many hospitals, but the most far-fetched was of a registrar who was having trouble with a difficult orthopaedic case in the middle of the night and asked the nurses to page the on-call consultant to see whether he could come in to help. He was unable to come in because he answered the phone whilst watching the cricket at Lord's! Although the financial details of this case weren't divulged to me, one can presume that if this was a private case that the overseas consultant's provider number was being used. Presumably someone who was happy to be overseas instead of helping a registrar out with a difficult case was not going to be the type of person who would hand back the money that was paid for the surgery he didn't do.

The hard evidence that these practices have been institutionalised comes from the Medicare Benefits Schedule (MBS). Somehow, Medicare has been lobbied to insert a clause into the MBS saying that a consultant surgeon can bill for an operation if the procedure was done by the registrar, as long as the consultant was 'directly supervising' the registrar.



I can't possibly fathom how it would ever be ethical to bill a private patient for an operation you didn't do yourself, so I consider this clause farcical. What makes it even more farcical is that it doesn't define 'direct supervision' as being 'in the same room', which of course it should. In fact, some hospitals appear to be adopting a very loose definition of 'direct supervision' indeed.

How do you fix a system which is this corrupt, and which appears to have tacit governmental approval (at least at the state level)? No surgical registrar is ever likely to voluntarily become a whistleblower. Being a surgeon is a licence to print money, and if you are a few years away from being awarded one of these licences, you don't want to risk upsetting anyone with the power to prevent you getting a licence. We need proper, fundamental change in the system.

There is actually an argument which runs that surgeons who act as consultants at public hospitals need to be paid vast sums for work that they don't actually do, because if they weren't, all of them would leave the public system completely and only offer their services in the even-more-lucrative private sector. The rebuttal to this argument is that reform is needed in the surgical private sector as well. One of the reasons why surgery is so expensive is that financial disclosure is a joke. It is almost impossible to cold call a surgeon's office and get a full quote for a procedure (e.g. how much would it cost me, in total, to have a knee arthroscopy with Dr Bloggs?).

Surgery should be somewhat expensive because it requires a high level of expertise and training. But so does flying a plane. When you want to book a flight from Sydney-London, you can go to a flight comparison website and see the complete fares that all of the various airlines can offer you. You don't get told that in order to find out how much the flight will cost that you'll have to book a pre-flight appointment with the pilot in three weeks, at which time he or she will let you know how much the pilot will be charging you. However, at that time the pilot will let you know that you'll receive separate charges from the co-pilot and the operators of the plane and these can't be specified as they have nothing to do with the pilot (even though the pilot is only going to offer you the choice of one co-pilot and one plane).

As a sports physician, knowledge of endemic surgical rotting has been particularly hard to swallow. After 15 years of application, sports and exercise medicine is finally going to become a specialty under Medicare this November. However, at the time of writing it appears that sports physicians will continue to generate substantially

lower Medicare rebates than other similar physicians, like rehabilitation physicians. No explanation has apparently been provided for the discrepancy. How could it be justified that a sports physician consultation was worth far less than an identical consultation with a rehabilitation physician? Multiple groups would justifiably protest in horror if Medicare suggested that female doctors or indigenous doctors or doctors who didn't attend private schools would generate lower rebates than those from more privileged groups. Sports physicians have previously received lower rebates than rehabilitation physicians based on a lie that 'sports medicine is not a specialty'. The truth was that over the last 15 years neither the government, nor the AMA, nor the Royal Australian College of Physicians were previously prepared to assess the specialty credentials of sports medicine. Given that this disgraceful situation will be reversed on November 1, the only argument for lower rebates for sports physicians compared to other physicians is that rebates in the past haven't been equal so they shouldn't be equal in the future, which is circular. Some readers may tire of me whingeing about equal rights for sports medicine under Medicare. And this is before I get onto the issue of whether the public system should pay more for other essential health services like physiotherapy. I am in no mood to stop every time I hear of stories of phantom surgeons passively earning many thousands per month without turning up to the operating lists that generate this money for them. There is money in the health 'system', but the 'system' is corruptly being manipulated by some surgeons, with the tacit approval of some public hospitals and a number of other lobby organisations to keep the richest of doctors in clover. The common denominator between failure to reform the Medicare Benefits Schedule and failure to reform the public hospitals is that the richest and most powerful doctors want to block it so that they don't have to share any of their enormous (and in some cases undeserved) slices of the pie.

Having ranted along the usual lines I'll finish by re-iterating that I have great respect for the good guys in the surgical world. The fact that surgery is so lucrative has its upside and we are lucky to have a generally very high standard of surgery in this country. I hope that it stays high but also that there is meaningful reform of the system and its incentives for hospital funding. This is clearly an untenable situation that should not continue. If nothing else is achieved by a Federal takeover of the public hospital system, then let this change be made.

Dr J

Analgesia in musculoskeletal sprains and strains: Don't underestimate the value of paracetamol

Controversy surrounds the early and aggressive use of NSAIDs in the initial post-injury treatment phase of musculoskeletal injuries.¹

NSAIDs have, at best, a mild effect on relieving symptoms and are potentially deleterious to tissue healing.^{2,3}

Prostaglandin inhibition by NSAIDs decreases the inflammatory response, which in the first 24–48 hours:¹

- limits the amount of damage through bleeding
- protects against further damage – swelling to immobilise
- initiates healing via macrophage removal of debris and regeneration

Therefore, decreasing inflammation through NSAID use, can result in increased bleeding at the injury site,¹ slower muscle regeneration¹ and potentially compromise long-term healing.^{1–4}

NSAIDs have, at best, a mild effect on relieving symptoms and are potentially deleterious to tissue healing.^{2,3}

Paracetamol is recommended first line for the analgesic treatment of acute musculoskeletal injuries.^{1,5,6}

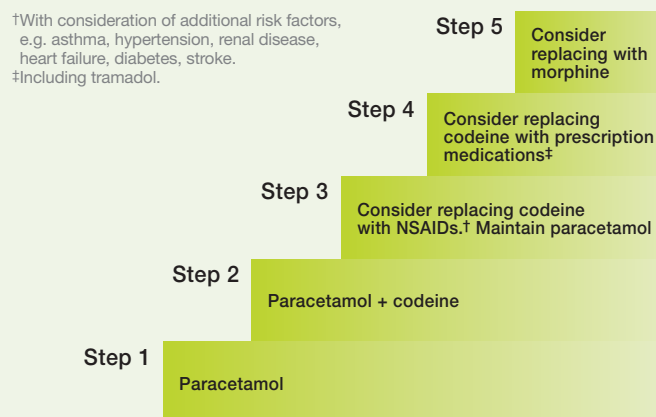
Internationally, the World Health Organisation (WHO) analgesic ladder was adapted by Boger and Jones (2005), to provide a step-wise approach in the analgesic treatment of chronic musculoskeletal pain (see Figure 1).⁵ In general, patients should begin at the first step and only if relief is not achieved, should the patient be moved to the next level.⁵

The National Health and Medical Research Council (NHMRC) in Australia also recommends paracetamol first line for mild-to-moderate acute musculoskeletal pain.⁶ Only where paracetamol provides insufficient pain relief, should an NSAID be used.⁶

Evidence suggests that paracetamol is equally as effective as an NSAID in the relief of acute musculoskeletal pain.^{7–15}

One large clinical trial comparing paracetamol and NSAIDs in musculoskeletal injuries found no difference in efficacy between the two regimens.⁸ There is also moderate evidence that paracetamol and NSAIDs are equally effective in relieving acute low-back pain.^{10–13}

Figure 1. 'Analgesic ladder' for musculoskeletal pain.^{1,5}



Adapted from Braund *et al*, 2007¹ and Boger *et al*, 2005.⁵

Another study compared extended-release paracetamol* versus ibuprofen in the treatment of ankle sprains.¹⁵ This study also showed equivalence, allowing patients to resume normal activities as early as 4 days after ankle sprain injury.¹⁵

Don't automatically recommend an NSAID for a sprain or strain due to its anti-inflammatory action.

Based on the evidence currently available, paracetamol should be the first choice analgesic for the management of acute musculoskeletal injuries,^{1,6} whilst NSAID use should be reserved for patients with excessive swelling^{1,3} or uncontrolled inflammation.¹

Paracetamol is recommended first line due to its efficacy and side-effect profile.^{1,6}

Panadol Back and Neck Long Lasting is a modified-release, bi-layer formulation that provides up to 8 hours of pain relief.¹⁶

The efficacy of paracetamol depends on adequate and regular dosing. The maximum daily dose of Panadol Back and Neck Long Lasting is 2 tablets three times a day, which provides 3,990 mg of paracetamol/day.¹⁶

So the next time a customer reaches for an NSAID to treat a musculoskeletal sprain or strain, consider recommending Panadol Back and Neck Long Lasting for effective pain relief.

It's my first choice



* The extended-release paracetamol product used in this study is a US-based formulation which contains 650 mg paracetamol versus the 665 mg in the Australian Panadol® Back and Neck Long Lasting formulation. Both formulations use bi-layer technology that provides an immediate-release layer of paracetamol followed by a slower, time-released layer of paracetamol to provide up to 8 hours of pain relief. BROUGHT TO YOU BY THE MAKERS OF PANADOL® IN THE INTEREST OF THE QUALITY USE OF MEDICINES. Panadol® contains paracetamol. Use Panadol for the temporary relief of pain and fever. Panadol® is a registered trade mark of the GlaxoSmithKline group of companies. GlaxoSmithKline Consumer Healthcare, 82 Hughes Avenue, Ermington NSW 2115. References: 1. Braund R, *et al*. *NZ J Physiotherapy* 2007; 35(2): 54–60. 2. Jones PG. *NZ Med J* 1999; 112(1097): 376–9. 3. Paoloni JA, *et al*. *Med J Aust* 2005; 183(7): 384–8. 4. Magra M, *et al*. *Clin J Sport Med* 2006; 16(1): 1–3. 5. Boger EJ, *et al*. *Musculoskeletal Care* 2005; 3: 224–32. 6. Evidence-Based Management of Acute Musculoskeletal Pain. Australian Acute Musculoskeletal Pain Guidelines Group. National Health Medical Research Council. 7. Gotzsche PC. *BMJ* 2000; 320: 1058–61. 8. Woo WW, *et al*. *Annals Emerg Med* 2005; 46: 352–61. 9. Roelofs PDDM, *et al*. *Cochrane Library* 2008; 1: 1–54. 10. Evans DP, *et al*. *Curr Med Res Opin* 1980; 6: 540–7. 11. Milgrom C, *et al*. *J Spinal Dis* 1993; 6: 187–93. 12. Nadler SF, *et al*. *Spine* 2002; 27(10): 1012–7. 13. Wiesel SW, *et al*. *Spine* 1980; 5: 324–30. 14. Kayali C, *et al*. *Saudi Med J* 2007; 28(12): 1836–9. 15. Dalton JD, *et al*. *Annals Emerg Med* 2006; 48(5): 615–23. 16. Panadol Back and Neck Approved Product Information. GLA0101/SH



Injury Report 2009: Australian Football League



The AFL has conducted and published an annual injury survey every season since 1992¹⁻³, making it the longest-running sports injury surveillance system in Australia and in professional sport. This survey has enabled the capture of 100 per cent of defined injury episodes ('any injury or other medical condition that prevents a player from participating in a regular season (home and away) or finals match') since 1997. Following is the 18th annual AFL Injury Report containing injury data from the 2009 season.

Results

Key indicators for the past 12 years are shown in Table 1. The injury incidence (number of new injuries per club per season) for 2009 was the highest (37.6 new injuries per team per season) it has been since the year 2000. Injury prevalence was the highest it has been since 1997 and continued the upward trend since 2003. Despite these increases, the rate of recurrent injuries (3.6 per team per season or 10%) was the lowest reported in the 18 years of the injury survey.

Other related studies have found that the increases in injury incidence each year since 2006 and injury prevalence each year since 2005 have paralleled significant increases in the use of the interchange and subsequent increases in the average speed of players and tackling during this period. There appears to be an association between these factors however their likely contribution to the increase in injuries needs to be confirmed.

Table 1 – Key indicators for all injuries over the past 13 seasons

All injuries	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Incidence (new injuries per club per season)	41.9	40.3	36.9	37.4	35.8	34.4	34.1	34.8	35.3	34.1	34.7	36.9	37.6
Incidence (recurrent)	8.4	7.6	5.2	5.9	5.5	4.4	4.6	3.7	4.8	4.1	5.6	5.4	3.6
Incidence (total)	50.3	47.9	42.1	43.3	41.3	38.7	38.7	38.5	40.1	38.2	40.4	42.3	41.2
Prevalence (missed games per club per season)	159.2	141.9	135.9	131.8	136.4	134.7	118.7	131.0	129.2	139.5	147.5	147.0	151.1
Average injury severity (number of missed games)	3.8	3.5	3.7	3.5	3.8	3.9	3.5	3.8	3.7	4.1	4.2	4.0	4.0
Recurrence rate	20%	19%	14%	16%	15%	13%	14%	11%	14%	12%	16%	13%	10%

Injury incidence

Table 2 details the incidence of the major injury categories. Notable findings include a continuation of the high rates for hamstring and quadriceps strains. Shoulder injuries and ACL injuries fell from 2008 to 2009.

Table 2 – Injury incidence (new injuries per club per season)

Body area	Injury type	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	10yr average
Head/neck	Concussion	0.6	0.7	0.7	0.3	0.3	0.7	0.3	0.3	0.4	0.5	0.5
	Facial fractures	0.7	0.4	0.4	0.6	0.8	0.6	0.3	0.4	0.2	0.5	0.5
	Neck sprains	0.2	0.1	0.0	0.0	0.1	0.2	0.3	0.1	0.2	0.1	0.1
	Other head/neck injuries	0.1	0.3	0.2	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.2
Shoulder/arm/elbow	Shoulder sprains and dislocations	0.7	1.1	0.9	1.3	1.0	1.4	1.6	1.0	1.8	1.3	1.2
	A/C joint injuries	1.3	0.9	1.1	0.3	1.1	0.8	1.2	0.8	0.7	0.5	0.9
	Fractured clavicles	0.5	0.3	0.3	0.2	0.6	0.3	0.3	0.3	0.1	0.2	0.3
	Elbow sprains or joint injuries	0.1	0.2	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.2	0.1
	Other shoulder/arm/elbow injuries	0.5	0.5	0.8	0.5	0.4	0.6	0.3	0.2	0.3	0.1	0.4
Forearm/wrist/hand	Forearm/wrist/hand fractures	1.4	0.8	1.1	0.8	1.1	1.3	1.1	0.9	1.2	1.1	1.1
	Other hand/wrist/forearm injuries	0.5	0.3	0.4	0.7	0.4	0.3	0.3	0.6	0.4	0.4	0.4
Trunk/back	Rib and chest wall injuries	0.8	0.4	0.9	0.8	0.7	0.4	1.0	0.4	0.7	0.3	0.7
	Lumbar and thoracic spine injuries	2.2	1.4	0.9	0.8	1.6	2.1	1.5	1.3	1.5	1.4	1.5
	Other buttock/back/trunk injuries	0.8	0.5	0.4	0.5	0.6	0.4	0.6	0.5	0.7	0.5	0.6

Body area	Injury type	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	10yr average
Hip/groin/thigh	Groin strains/osteitis pubis	3.0	3.5	3.8	2.9	3.1	2.9	3.3	4.1	3.2	3.2	3.3
	Hamstring strains	5.6	6.0	4.4	5.7	6.3	5.2	6.4	6.7	6.6	7.1	6.0
	Quadriceps strains	2.0	1.6	1.7	2.0	1.9	1.9	1.7	1.8	1.8	2.2	1.9
	Thigh and hip haematomas	1.1	0.6	1.0	0.3	1.1	1.0	1.1	0.6	0.5	1.0	0.8
	Other hip/groin/thigh injuries, including hip joint	0.3	0.3	0.3	0.4	0.3	0.2	0.3	0.8	0.8	1.0	0.5
Knee	Knee ACL	0.5	0.9	0.8	0.6	0.5	0.6	1.0	0.7	0.9	0.6	0.7
	Knee MCL	0.9	1.2	0.9	1.0	0.7	1.0	0.8	1.4	1.3	0.7	1.0
	Knee PCL	0.5	1.0	0.4	0.5	0.7	0.4	0.3	0.2	0.3	0.3	0.4
	Knee cartilage	1.2	1.9	1.3	1.7	1.2	1.3	1.0	1.2	1.7	1.9	1.4
	Patella injuries	0.2	0.2	0.4	0.1	0.1	0.3	0.3	0.3	0.2	0.2	0.2
	Knee tendon injuries	0.7	0.5	0.8	0.7	0.4	0.7	0.4	0.3	0.3	0.5	0.5
	Other knee injuries	1.3	0.8	0.5	0.7	0.7	0.9	0.2	0.8	1.0	1.0	0.8
Shin/ankle/foot	Ankle joint sprains, including syndesmosis sprains	2.7	2.0	2.5	2.6	2.5	2.5	2.1	2.2	2.5	2.6	2.4
	Calf strains	1.9	1.6	2.2	1.6	0.9	1.9	1.6	1.2	2.0	1.3	1.6
	Achilles tendon injuries	0.4	0.2	0.4	0.4	0.2	0.3	0.3	0.4	0.6	0.6	0.4
	Leg and foot fractures	0.6	1.0	0.8	0.5	0.5	0.4	0.7	0.5	0.5	1.0	0.7
	Leg and foot stress fractures	0.5	0.9	0.7	0.9	0.9	0.9	1.1	1.1	0.9	0.9	0.9
	Other leg/foot/ankle injuries	1.3	1.7	0.8	1.5	1.7	1.3	1.5	1.3	1.1	1.5	1.4
Medical	Medical illnesses	1.9	1.8	2.3	2.4	2.0	2.2	0.7	1.9	2.1	2.9	2.0
Non-football injuries		0.2	0.2	0.3	0.4	0.1	0.1	0.2	0.2	0.3	0.1	0.2
New Injuries/Club/Season		37.4	35.8	34.4	34.1	34.8	35.3	34.1	34.7	36.9	37.6	35.5

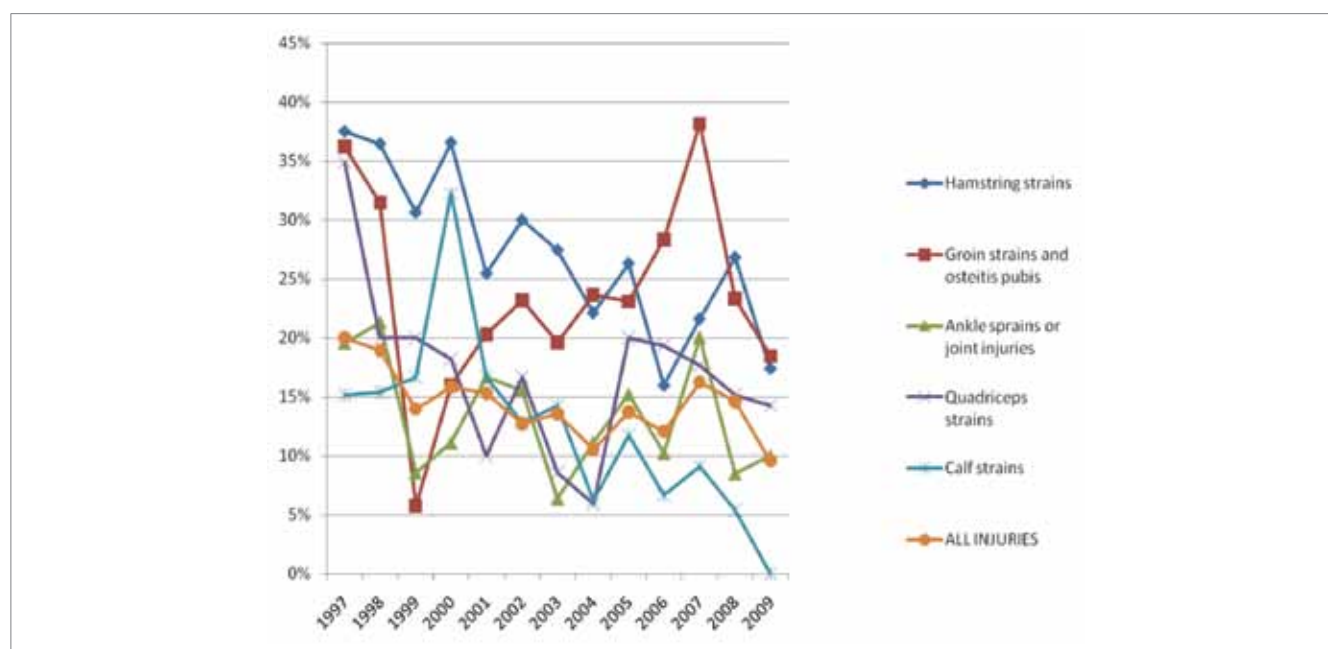
Injury recurrence

Table 3 and Figure 1 show the rate of recurrence of some of the common injury types, particularly muscle strains which have a comparatively high recurrence rate. Most contact-mechanism injuries, such as fractures, concussions and 'cork' injuries have a low recurrence rate. The rate of injury recurrence has been showing a fairly steady decline over the last 10 years, with all of the common muscle strains showing a steady decline in recurrence rate¹³. Across the board there has been a trend for team medical staff to be more conservative with injury management (slower return to play and fewer recurrences).

Table 3 – Recurrence rates (recurrent injuries as a percentage of new injuries)

Recurrence rates	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Hamstring strains	38%	36%	31%	37%	25%	30%	27%	22%	26%	16%	22%	25%	17%
Groin strains and osteitis pubis	36%	31%	6%	16%	20%	23%	20%	24%	23%	28%	38%	20%	19%
Ankle sprains or joint injuries	20%	21%	9%	11%	17%	16%	6%	11%	15%	10%	20%	9%	10%
Quadriceps strains	35%	20%	20%	18%	10%	17%	9%	6%	20%	19%	18%	15%	14%
Calf strains	15%	15%	17%	32%	17%	13%	14%	6%	12%	7%	9%	5%	0%
All injuries	20%	19%	14%	16%	15%	13%	14%	11%	14%	12%	16%	13%	10%

Figure 1 – Recurrence rates (recurrent injuries as a percentage of new injuries)



Weekly player status and injury prevalence

Table 4 details player status on a weekly basis over the past 10 seasons. The 'average' status of a club list of 46 players in any given week for 2009 was:

- 35 players playing football per week, 22 in the AFL
- 8 missing through injury
- 3 missing through other reasons (such as suspension, being used as a travelling emergency, team bye in a lower grade)

The increased injury prevalence over the past three years appears to be mainly related to increased injury severity (number of weeks that players miss per injury) rather than an increase in injury incidence.

Table 4 – Average weekly player status by season

All injuries	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Playing AFL	21.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Playing lower grade football	11.8	11.4	11.4	11.3	12.9	12.1	12.0	11.9	12.2	11.8	11.9	11.7	12.8
<i>TOTAL playing</i>	32.8	33.4	33.4	33.3	34.9	34.1	34.0	33.9	34.2	33.8	33.9	33.7	34.8
Not playing because of injury	7.7	6.7	6.4	6.2	6.7	6.6	5.7	6.4	6.4	7.0	7.4	7.4	7.9
Not playing for other reasons	1.9	1.6	1.8	1.8	1.8	2.3	2.5	2.5	2.8	3.1	2.9	3.4	3.4
<i>TOTAL not playing</i>	9.6	8.3	8.3	8.0	8.5	8.9	8.2	8.9	9.1	10.1	10.4	10.8	11.4
<i>Players in injury survey (per club)</i>	42.3	41.7	41.7	41.4	43.4	43.0	42.2	42.8	43.3	43.9	44.2	44.6	46.1
<i>Injury prevalence (%)</i>	18.1%	16.1%	15.4%	15.0%	15.5%	15.3%	13.5%	14.9%	14.7%	15.9%	16.8%	16.7%	17.2%

Table 5 details the amount of missed playing time attributed to each injury category. Hamstring injuries remain the number one injury in the game with respect to missed playing time, surpassing both groin injuries and knee anterior cruciate ligament (ACL) injuries. Based on injury prevalence (missed playing time), these three categories are consistently the highest categories for injury prevalence. However, the prevalence of all three of these injury categories was slightly below the long-term average in 2009.

Shoulder injuries showed a decrease in the amount of lost playing time in 2009 compared to 2008, although this was still above the long-term average. There was a higher than usual prevalence of leg and foot stress fractures in 2009.

Table 5 – Injury prevalence (missed games per club per season)

Body area	Injury type	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	10yr average
Head/ neck	Concussion	0.7	1.3	2.0	0.6	0.3	0.9	0.3	0.3	0.5	0.7	0.8
	Facial fractures	2.0	1.3	1.4	1.0	2.2	1.4	0.8	0.7	0.5	1.1	1.2
	Neck sprains	0.3	0.2	0.0	0.0	0.6	0.3	0.3	1.1	1.1	0.1	0.4
	Other head/neck injuries	0.8	1.5	0.2	0.7	0.2	0.2	1.1	1.6	0.1	0.3	0.7
Shoulder/ arm/ elbow	Shoulder sprains and dislocations	4.0	5.4	5.9	5.7	5.9	7.7	10.8	6.4	10.2	7.7	7.0
	A/C joint injuries	3.1	2.1	2.4	0.7	2.5	1.9	2.7	1.4	1.5	1.2	1.9
	Fractured clavicles	3.0	1.6	2.0	1.0	3.5	1.3	1.7	1.8	1.1	0.6	1.8
	Elbow sprains or joint injuries	0.1	0.4	0.3	0.4	0.7	0.4	0.7	0.8	0.5	1.5	0.6
	Other shoulder/arm/elbow injuries	1.3	1.3	3.4	1.6	1.6	2.4	1.7	0.7	0.7	1.0	1.6
Forearm/ wrist/ hand	Forearm/wrist/hand fractures	5.6	2.7	3.1	2.5	3.9	3.8	4.3	2.3	3.2	4.8	3.6
	Other hand/wrist/forearm injuries	1.4	0.3	2.2	2.9	1.2	1.2	0.5	3.1	1.4	0.8	1.5
Trunk/ back	Rib and chest wall injuries	1.3	0.7	1.5	1.7	1.3	0.6	2.2	1.9	1.3	0.6	1.3
	Lumbar and thoracic spine injuries	8.4	5.6	5.8	2.1	5.4	6.4	5.4	2.8	5.0	4.6	5.1
	Other buttock/back/trunk injuries	2.6	1.5	1.6	1.6	2.3	0.7	1.3	1.7	1.3	1.2	1.6
Hip/ groin/ thigh	Groin strains/osteitis pubis	7.5	13.6	15.7	13.7	13.3	11.2	14.0	18.0	12.4	11.6	13.1
	Hamstring strains	22.4	21.3	15.6	18.6	21.6	18.6	21.8	24.3	25.8	22.0	21.2
	Quadriceps strains	5.6	3.8	4.3	6.0	4.2	6.4	5.5	5.6	6.5	8.6	5.7
	Thigh and hip haematomas	1.8	0.6	1.9	0.5	1.7	1.6	1.4	1.0	0.6	1.2	1.2
	Other hip/groin/thigh injuries, including hip joint	1.4	1.7	1.2	1.5	2.6	1.0	2.3	4.5	3.4	6.9	2.6
Knee	Knee ACL	4.8	13.6	15.3	10.8	10.1	9.3	15.3	15.9	15.3	11.1	12.2
	Knee MCL	3.5	4.8	2.8	2.9	2.9	3.0	1.7	4.7	4.0	2.3	3.3
	Knee PCL	2.3	5.9	2.3	2.0	6.5	2.7	1.8	1.6	2.2	1.2	2.8
	Knee cartilage	8.6	12.5	6.0	7.0	6.1	7.8	5.7	9.1	8.9	10.7	8.2
	Patella injuries	1.8	0.8	2.5	0.6	0.1	0.8	1.2	2.7	1.0	1.8	1.3
	Knee tendon injuries	3.9	2.5	3.7	2.9	0.9	2.6	1.8	0.7	1.1	0.8	2.1
	Other knee injuries	3.6	2.5	1.0	2.4	1.3	3.8	0.2	2.6	2.7	2.6	2.3
Shin/ ankle/ foot	Ankle joint sprains, including syndesmosis sprains	6.8	4.3	5.9	5.3	6.4	9.2	8.1	7.1	7.0	8.9	6.9
	Calf strains	5.7	3.4	4.4	3.8	1.7	4.5	3.4	3.1	4.3	3.0	3.7
	Achilles tendon injuries	1.6	0.7	0.9	1.5	0.8	1.9	2.1	2.2	4.1	2.2	1.8
	Leg and foot fractures	4.6	7.0	7.9	2.9	3.7	2.7	5.7	2.7	3.2	7.5	4.8
	Leg and foot stress fractures	3.8	4.4	3.9	5.3	6.3	5.1	8.2	6.8	7.3	11.0	6.2
	Other leg/foot/ankle injuries	3.9	4.2	2.3	3.7	4.3	4.2	4.1	4.2	4.6	6.8	4.2
Medical	Medical illnesses	2.8	2.6	2.9	3.8	4.2	3.6	0.7	3.1	3.5	3.7	3.1
Non-football injuries		0.6	0.3	2.4	1.0	0.4	0.1	0.5	1.0	0.7	0.9	0.8
Missed Games/Club/Season		131.8	136.4	134.7	118.7	131.0	129.2	139.5	147.5	147.0	151.1	136.7

Analysis of significant injury categories

Hamstring injuries

Hamstring injuries are the most common injury in the AFL and are responsible for the highest number of matches missed through injury³. 2009 recorded the highest incidence on record and a furthering of the upward trend in incidence since 2005.

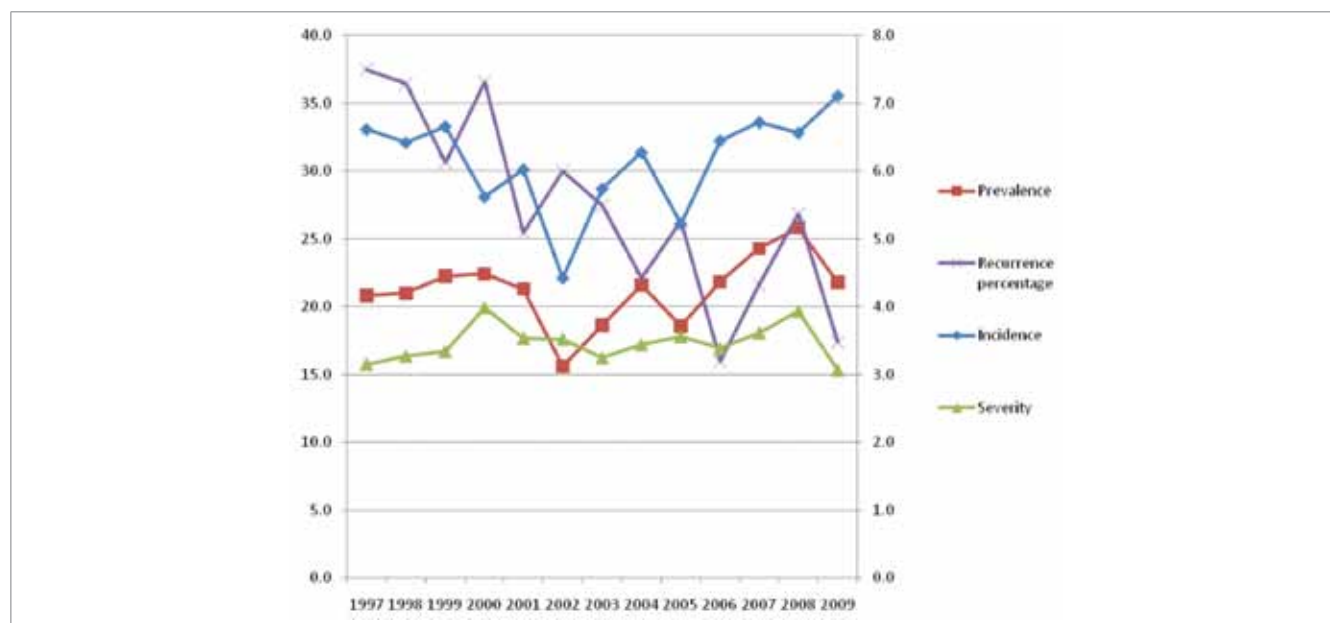
The majority of hamstring injuries in Australian football occur in matches although some occur during training sessions or by other means. Known risk factors include player age, past history of hamstring injury, strength deficits, indigenous race and past history of other injury (including calf, knee, ankle and groin injuries)^{14–17}.

Previous analysis of hamstring and other muscle strain data shows a high rate of recurrence^{13,15,17–22}. The current AFL data shows that management of these injuries has become more conservative over the last 12 years in the AFL, with recurrence tending to decrease but prevalence and severity tending to increase (Figure 2). This change in management strategy has possibly been led by research showing that recurrence rates remain high for many weeks after the initial injury¹⁸ and that performance of players is often decreased in the matches soon after return from hamstring strain²². Hamstring injuries are known to affect older players and those with a past history of injury more often^{13,15,17–22} than other players.

Table 6 – Key indicators for hamstring strains over the past 13 seasons

Hamstring injuries	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Incidence	6.6	6.4	6.7	5.6	6.0	4.4	5.7	6.3	5.2	6.4	6.7	6.6	7.1
Prevalence	20.9	21.0	22.3	22.4	21.3	15.6	18.6	21.6	18.6	21.8	24.3	25.8	22.0
Severity	3.2	3.3	3.3	4.0	3.5	3.5	3.2	3.4	3.6	3.4	3.6	3.9	3.1
Recurrence rate (%)	38	36	31	37	25	30	27	22	26	16	22	27	17

Figure 2 – Key indicators for hamstring strains over the past 13 seasons



Knee ligament injuries

The two major knee ligament injuries show continuing divergent trends, with posterior cruciate ligament (PCL) injury rates decreasing in recent years but anterior cruciate ligament (ACL) injury prevalence slightly increasing (Table 7). There was a continuation of the low rates of PCL injuries since the introduction of the centre circle rule. Table 7 shows that there were only six reported PCL injuries in season 2009, and although one of these did occur at centre bounce ruck duels, there have been few injuries from this reported mechanism since 2005. There has certainly been a long-term decline in the incidence and prevalence of PCL injuries.

Knee ACL injury incidence has been generally steady over the past few seasons (Table 7). However ACL injury prevalence (time missed due to these injuries) has increased over the past few seasons. This is in keeping with the trend observed with other injuries that players are being managed more conservatively (that is, staying out of the game for longer following their initial injury). Future injury reports and further study may be able to document the effect, if any, of newer ACL reconstruction techniques such as the LARS ligament.

Table 7 – Key indicators for major knee ligament injuries over the past 13 seasons

Knee ligament injuries	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
PCL incidence	0.6	0.3	0.7	0.5	1.0	0.4	0.5	0.7	0.4	0.3	0.2	0.3	0.3
PCL prevalence	1.9	2.2	5.2	2.3	5.9	2.3	2.0	6.5	2.7	1.8	1.6	2.2	1.2
PCL severity	3.3	7.4	7.2	4.8	5.9	5.9	4.4	9.0	7.0	6.8	9.7	8.2	3.8
Number of centre bounce PCL injuries (compared to total injuries)	0/10	2/5	3/12	4/8	4/18	3/7	2/8	5/13	1/7	0/5	0/3	2/5	1/6
ACL incidence	1.2	0.8	0.7	0.5	0.9	0.8	0.6	0.5	0.6	1.0	0.7	1.0	0.6
ACL prevalence	19.8	15.8	10.8	4.8	13.6	15.3	10.8	10.1	9.3	15.3	15.9	15.3	11.1
Number of graft ruptures (compared to total ACL injuries)	3/21	2/15	0/8	1/8	1/17	4/15	0/11	2/9	1/10	4/19	2/13	4/17	1/13

Head and neck injuries

Table 8 shows consistently low incidence and prevalence for head and neck injuries (combined) over the past decade. Season 2008 reported both the lowest incidence and prevalence of head and neck injuries since the survey commenced, with the prevalence figures similar in 2009 to 2008. This suggests that reduced tolerance of head-high contact and stricter policing of dangerous tackles along with the introduction of rules to penalise a player who makes forceful contact to another player with his head over the ball has contributed to these positive trends.

Table 8 – Key indicators for head and neck injuries over the past 13 seasons

Head and neck injuries	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Incidence	1.8	1.6	1.6	1.6	1.5	1.2	1.2	1.4	1.6	1.0	0.9	0.9	1.1
Prevalence	4.1	3.5	4.6	3.8	4.2	3.7	2.2	3.3	2.7	2.5	3.7	2.2	2.2
Severity	2.3	2.2	3.0	2.3	2.9	3.0	1.8	2.4	1.7	2.6	4.0	2.6	1.9

Shoulder injuries

Table 9 shows a slight but steady increase in the rates of shoulder injuries over the past 13 years, with the exception of recurrence rates which are falling. It is possible that the increased number and ferocity of tackles during this period has contributed to the increased risk of shoulder injury. The increasing speed of the game may be a contributing factor and this relationship is currently being investigated with a project funded through the AFL Research Board.

However, the observed data are also consistent with the notion that perhaps players and some teams are electing in certain circumstances to end a player's season early to undertake shoulder reconstructive surgery. Unlike knee reconstructions, shoulder reconstructions can often be delayed until the end of the season. However, the recommended six month recovery time after a shoulder reconstruction would tend to lead to a delayed start for the following season. There is a possibility that there is a greater tendency for teams to end a player's season somewhat earlier which is impacting on the observed rates of shoulder injury.

Table 9 – Key indicators for shoulder injuries over the past 13 seasons

Shoulder sprains and dislocations	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Incidence	1.0	0.9	0.7	0.7	1.1	0.9	1.3	1.0	1.4	1.6	1.0	1.8	1.3
Prevalence	5.3	5.9	5.6	4.0	5.4	5.9	5.7	5.9	7.7	10.8	6.4	10.2	7.7
Severity	5.3	6.5	8.5	5.6	4.9	6.7	4.4	5.9	5.6	6.7	6.3	5.8	5.7
Recurrence rate	12%	13%	27%	17%	10%	13%	9%	11%	20%	13%	16%	9%	12%

Groin injuries

Groin injuries (including osteitis pubis) are consistently one of the three injury categories that cause the most missed playing time in the AFL. As a group, groin injuries represent a number of overlapping diagnoses, including adductor muscle strains, tendinopathy, osteitis pubis and sports hernias. In general these injuries have a high rate of recurrence and a high rate of becoming chronic. Incidence appears to be quite constant from season to season (3–4 new injuries per club per season) but prevalence (missed playing time) and recurrence rates vary from season to season.

Table 10 – Key indicators for groin injuries over the past 13 seasons

Groin injuries	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Incidence	4.1	3.2	3.1	3.0	3.5	3.8	2.9	3.1	2.9	3.3	4.1	3.2	3.2
Prevalence	17.4	13.6	9.4	7.5	13.6	15.7	13.7	13.3	11.2	14.0	18.0	12.4	11.6
Severity	4.3	4.2	3.0	2.5	3.9	4.1	4.8	4.4	3.9	4.3	4.4	3.9	3.6
Recurrence rate	36%	31%	6%	16%	20%	23%	20%	24%	23%	28%	38%	23%	19%

Analysis of injury prevalence by player age and experience

Previous studies have shown that hamstring and calf injuries are more common in older players in the AFL. Earlier study has suggested that groin injuries do not affect older or younger players more often, although there has been a perception in recent years that younger players are more susceptible to osteitis pubis.

Table 11 confirms that, over the last five seasons, the player age group most susceptible to missing time through injury has been the 30+ age group. The excess injury risk in older players is explained particularly by hamstring and calf strains, along with knee cartilage injuries. Younger players, particularly first year players, are in contrast susceptible to groin injuries (including osteitis pubis), stress fractures and shoulder injuries. Despite the increased risk due to these injuries, because of the lower risk of knee cartilage injuries and hamstring and calf strains, a younger player is still less prone to missing time through injury than an older player.

Table 11 – Injury prevalence (missed games per club per season) 2005–2009 by age

Body area	Injury type	First year players	Non-first year	Age <21	21–23	24–26	27–29	Age 30+
Head/neck	Concussion	0.9	0.5	0.6	0.6	0.6	0.2	0.4
	Facial fractures	0.8	0.9	1.1	0.8	0.5	1.6	0.0
	Neck sprains	0.1	0.7	0.2	0.0	1.3	0.5	3.2
	Other head/neck injuries	0.3	0.7	0.8	0.5	0.1	1.2	0.8
Shoulder/arm/elbow	Shoulder sprains and dislocations	13.7	7.6	11.8	9.9	4.7	2.5	5.3
	A/C joint injuries	0.8	1.9	1.6	2.5	1.9	0.8	0.2
	Fractured clavicles	3.0	1.0	1.8	1.1	0.6	0.1	3.2
	Elbow sprains or joint injuries	1.7	0.6	0.7	1.5	0.2	0.1	1.3
	Other shoulder/arm/elbow injuries	1.4	1.3	1.2	1.4	1.2	1.8	1.1
Forearm/wrist/hand	Forearm/wrist/hand fractures	4.6	3.5	4.6	3.7	3.0	1.1	5.0
	Other hand/wrist/ forearm injuries	1.2	1.4	0.9	1.7	1.3	1.9	2.9
Trunk/back	Rib and chest wall injuries	1.2	1.3	1.0	0.9	1.2	1.5	5.5
	Lumbar and thoracic spine injuries	7.8	4.2	5.6	4.6	3.3	4.7	5.9
	Other buttock/back/ trunk injuries	0.7	1.3	1.1	1.1	1.7	1.1	1.7
Hip/groin/thigh	Groin strains/osteitis pubis	24.7	11.2	18.6	10.7	8.3	10.6	12.8
	Hamstring strains	18.6	23.3	20.0	23.2	22.5	25.4	31.3
	Quadriceps strains	10.2	5.8	9.5	5.6	3.3	6.0	2.3
	Thigh and hip haematomas	1.7	1.0	1.4	1.2	0.6	0.7	1.7
	Other hip/groin/thigh injuries, including hip joint	3.9	3.6	4.7	2.2	2.3	3.2	8.8
Knee	Knee ACL	8.5	14.4	10.3	14.8	20.0	10.7	11.6
	Knee MCL	1.6	3.4	2.7	4.1	2.8	3.5	2.3
	Knee PCL	0.3	2.2	1.2	1.6	2.6	2.6	3.6
	Knee cartilage	4.3	9.3	4.4	8.3	11.3	11.5	21.7
	Patella injuries	0.6	1.7	1.3	0.5	1.4	4.9	1.1
	Knee tendon injuries	1.2	1.4	1.3	0.9	0.9	3.3	1.9
	Other knee injuries	1.6	2.5	3.1	1.7	2.7	1.5	1.3

Body area	Injury type	First year players	Non-first year	Age <21	21–23	24–26	27–29	Age 30+
Shin/ankle/foot	Ankle joint sprains, including syndesmosis sprains	7.5	8.2	7.9	8.7	7.0	8.5	8.8
	Calf strains	1.7	4.0	1.6	3.0	4.3	6.5	13.5
	Achilles tendon injuries	1.1	2.7	0.5	1.4	4.4	5.6	7.8
	Leg and foot fractures	5.1	4.3	5.2	5.0	2.8	3.6	2.9
	Leg and foot stress fractures	10.5	7.2	9.2	7.8	7.5	4.8	3.6
	Other leg/foot/ankle injuries	4.3	4.9	4.5	5.0	3.1	9.4	2.3
Medical	Medical illnesses	3.2	2.8	3.4	2.7	2.5	3.2	1.7
Missed Games/Club/Season		148.9	141.1	144.1	138.6	131.8	144.7	177.8

Snapshot

- Overall a higher injury incidence and prevalence in season 2009 compared with season 2008. However, the rate of recurrent injuries dropped in season 2009.
- Continued low rates of knee posterior cruciate ligament (PCL) and head and neck injuries.
- The number one injury in the game remains the hamstring strain. Both incidence and prevalence rates of this injury remain high. Incidence of hamstring injuries increased in 2009.
- Other studies related to the injury survey have reported that interchange use, player speed and tackling have increased parallel to injuries in recent seasons. There appears to be an association between these factors however their likely contribution to the increase in injuries needs to be confirmed.
- The most severe common injury is still the knee anterior cruciate ligament (ACL) tear, with slightly lower rates in season 2009 compared to 2006–08.
- The 'average' status of a club list of 46 players in any given week includes eight players missing through injury. This is an increase from six in 2003–05 and seven in 2006–08.
- Analysis of injuries by age for the last five seasons showed that older players miss more time through hamstring and calf strains and knee cartilage injuries. Younger players miss more time through groin injuries (including osteitis pubis), shoulder instability and leg and foot stress fractures. Overall, older players (30+) miss more time through injury than younger players (<21).
- Recurrence rates for injuries were the lowest on record, with only 10 per cent of injuries recurring from the time of return to the end of the season. This rate has steadily dropped from 20 per cent in 1997. Recurrence rates may reflect more conservative medical decision making and improved treatment and rehabilitation.

Acknowledgements

The authors and AFL Medical Officers would like to acknowledge the following people who contributed to the survey in 2009: David Binney, Dr Andrew Potter (Medical Services Coordinator and Doctor, Adelaide), Nathan Carlross (Doctor, Brisbane), Dr Ben Barresi (Doctor, Carlton), Dr Andrew Jowett and Gary Nicholls (Doctor and Physiotherapist, Collingwood), Bruce Connor (Physiotherapist, Essendon), Jeff Boyle and Norm Tame (Physiotherapist and Football Staff, Fremantle), Dr Chris Bradshaw (Doctor, Geelong), Dr Peter Baquie and Andrew Lambart (Doctor and Football Staff, Hawthorn), Dr Andrew Daff (Doctor, Melbourne), Dr Con Mitropolous (Doctor, Kangaroos), Dr Peter Barnes and Michael Heynan (Doctor and Football Staff, Port Adelaide), Dr Greg Hickey (Doctor, Richmond), Dr Tim Barbour (Doctor, St. Kilda), Dr Nathan Gibbs (Doctor, Sydney), Paul Tucker (Physiotherapist, West Coast Eagles), Dr Gary Zimmerman (Doctor, Western Bulldogs), Dr Peter Harcourt and Dr Harry Unglik (AFL Medical Commissioners), Shane McCurry, Rod Austin, Jill Lindsay and Adrian Anderson (AFL Administration), Champion data, all football operations staff at clubs who complete weekly player movement monitoring forms and all those acknowledged in the injury reports for previous years.

Associate Professor John Orchard

Adjunct Associate Professor, University of Sydney

Dr Hugh Seward

Executive Officer, ALF Medical Officers Association

The full report, detailing the methods used, is available at www.injuryupdate.com.au/images/research/AFLInjuryReport2009.pdf

References

- 1 Seward H, Orchard J, Hazard H, Collinson D. Football injuries in Australia at the elite level. *Med J Aust* 1993;159:298–301.
- 2 Orchard J, Wood T, Seward H, Broad A. AFL Injury Report 1996. *Football record* 1997;86(8):S14–S23.
- 3 Orchard J, Seward H. Epidemiology of injuries in the Australian Football League, seasons 1997–2000. *Br J Sports Med* 2002;36:39–45.
- 4 Hagglund M, Walden M, Bahr R, Ekstrand J. Methods for epidemiological study of injuries to professional football players: developing the UEFA model. *Br J Sports Med* 2005;39:340–46.
- 5 Fuller C, Molloy M, Bagate C, Bahr R, Brooks J, Donson H, et al. Consensus statement on injury definitions and data collection procedures for studies of injuries in rugby union. *Clin J Sport Med* 2007;17(3):177–81.
- 6 Fuller C, Ekstrand J, Junge A, Andersen T, Bahr R, Dvorak J, et al. Consensus statement on injury definitions and data collection procedures in studies of football (soccer) injuries. *Br J Sports Med* 2006;40:193–201.
- 7 Thacker S. Editorial: Public health surveillance and the prevention of injuries in sports: what gets measured gets done. *J Athl Train* 2007;42(2):171–72.
- 8 Orchard J, Hoskins W. For debate: consensus injury definitions in team sports should focus on missed playing time. *Clin J Sport Med* 2007;17(3):192–96.
- 9 Orchard J, Seward H. AFL Injury Report: Season 2007. *Sport Health* 2008;26(2):23–38, <http://www.injuryupdate.com.au/images/research/AFLinjuryreport2007SH.pdf>.
- 10 Rae K, Britt H, Orchard J, Finch C. Classifying sports medicine diagnoses: a comparison of the international classification of diseases 10-Australian modification (ICD-10-AM) and the Orchard sports injury classification system (OSICS-8). *Br J Sports Med* 2005;39:907–11.
- 11 Rae K, Orchard J. The Orchard Sports Injury Classification System (OSICS) Version 10. *Clin J Sport Med* 2007;17(3):201–04.
- 12 Hodgson L, Gissane C, Gabbett T, King D. For debate: consensus injury definitions in team sports should focus on encompassing all injuries. *Clin J Sport Med* 2007;17(3):188–91.
- 13 Orchard J, Best T, Verrall G. Return to play following muscle strains. *Clin J Sport Med* 2005;15(6):436–41.
- 14 Orchard J, Marsden J, Lord S, Garlick D. Preseason hamstring muscle weakness associated with hamstring muscle injury in Australian footballers. *Am J Sports Med* 1997;25:81–85.
- 15 Gabbe B, Bennell K, Finch C. Why are older Australian football players at greater risk of hamstring injury? *J Sci Med Sport* 2006;9(3):in press.
- 16 Verrall G, Slavotinek J, Barnes P, Fon G, Spriggins A. Clinical risk factors for hamstring muscle strain injury: a prospective study with correlation of injury by magnetic resonance imaging. *British Journal of Sports Medicine* 2001;35:435–40.
- 17 Orchard J. Intrinsic and extrinsic risk factors for muscle strain injury in Australian footballers. *Am J Sports Med* 2001;29(3):300–03.
- 18 Orchard J, Best T. The management of muscle strain injuries: an early return versus the risk of recurrence [guest editorial]. *Clin J Sport Med* 2002;12:3–5.
- 19 Bennell K, Wajswelner H, Lew P, Schall-Riaucour A, Leslie S, Plant D, et al. Isokinetic strength testing does not predict hamstring injury in Australian rules footballers. *Br J Sports Med* 1998;32:309–14.
- 20 Gabbe B, Branson R, Bennell K. A pilot randomised controlled trial of eccentric exercise to prevent hamstring injuries in community-level Australian football. *J Sci Med Sport* 2006;9(1–2):103–09.
- 21 Verrall G, Slavotinek J, Barnes P, Fon G, Spriggins A. Clinical risk factors for hamstring muscle strain injury: a prospective study with correlation of injury by magnetic resonance imaging. *Br J Sports Med* 2002;35:435–39.
- 22 Verrall G, Kalairajah Y, Slavotinek J, Spriggins A. Assessment of player performance following return to sport after hamstring muscle strain injury. *J Sci Med Sport* 2006;9(1–2):87–90.
- 23 Cromwell F, Walsh J, Gormley J. A pilot study examining injuries in elite gaelic footballers. *Br J Sports Med* 2000;34:104–08.
- 24 Orchard J, Seward H. AFL 1999 Injury Report: injuries on the decline. *AFL Record* 2000;89(5):29–32.
- 25 Orchard J, Chivers I, Aldous D, Bennell K, Seward H. Ryegrass is associated with fewer non-contact anterior cruciate ligament injuries than bermudagrass. *Br J Sports Med* 2005;39:704–09.
- 26 Orchard J, Seward H. AFL Injury Report 2002. *Sport Health* 2003;21 (2):18–23.
- 27 Orchard J, Seward H. AFL Injury Report 2003. *J Sci Med Sport* 2004;7(2):264–5.
- 28 Orchard J, Seward H, McGivern J, Hood S. Rainfall, evaporation and the risk of non-contact Anterior Cruciate Ligament knee injuries in the Australian Football League. *Med J Aust* 1999;170:304–06.
- 29 Orchard J, Seward H, McGivern J, Hood S. Intrinsic and extrinsic risk factors for Anterior Cruciate Ligament injury in Australian footballers. *Am J Sports Med* 2001;29(2):196–200.
- 30 Orchard J, Verrall G. Groin injuries in the Australian Football League. *International Sportsmed Journal* 2000;1(1).
- 31 Orchard J, Wood T, Seward H, Broad A. Comparison of injuries in elite senior and junior Australian football. *J Sci Med Sport* 1998;1(2):82–88.



Where are they now?

A snapshot look at the recipients of the Australian Sports Medicine Federation Fellow's Awards

As part of our 'Where are they now?' series, *Sport Health* is honoured to have Mitch Duncan provide a personal narrative of what he has been up to over the past two years since winning the **Asics Award for Best New Investigator – Health Promotion** for his paper entitled 'Association between degree of urbanisation, physical activity and perceptions of the environment in Queensland adults'.

Starting off as a young and impressionable undergraduate student at Central Queensland University, Mitch decided to continue in academics, undertaking and successfully completing his honours degree and PhD under the guidance of Professor Kerry Mummery. Over the years Mitch has developed into a leading researcher at CQUniversity (formally Central Queensland University) in Rockhampton, Queensland and is currently a Senior Post-Doctoral Research Fellow at the Institute for Health and Social Science Research. Mitch is surrounded by a group of research colleagues who share in his passion of health related physical activity research. This is evident by the many regional and national projects Mitch is currently involved with.

I am very excited to share with you all what Mitch has been up to since winning the **Asics Award for Best New Investigator – Health Promotion** and where he is now...



Dr Mitch Duncan

I was awarded the Asics Award for Best New Investigator – Health Promotion in 2008. I won this award for a paper outlining that the perceived presence of characteristics supporting physical activity, and relationships between perceptions and physical activity vary according to the degree of urbanisation. The SMA conference was held on Hamilton Island and made for a very scenic and enjoyable conference experience.

I was a Post-Doctoral research fellow at CQUniversity when I won the award and while I'm still at CQUni, a lot has changed work wise since then.

I was part of a team at CQUni that worked with other collaborators to have a very productive 2009, securing

several external grants. These included an NHMRC Project Grant, ARC – Linkage Project and ARC – Discovery Project.

The NHMRC grant will develop an internet platform to deliver a Web 2.0 intervention to increase physical activity and examine the efficacy of the platform. This project builds on the work that we have completed or that is currently underway including 10,000 Steps, and several other internet delivered interventions.

The ARC projects are concerned with how different aspects of the environment (built, social or policy) influence the activity and travel behaviours of children and, in turn, their health. The combination of the research partners on the Linkage Project (Queensland Health, Queensland Transport, Mooreland City Council, and Merri Community Health

Services), the diverse expertise of the research team, and the various research sites make this not only challenging but also a very exciting project to work on.

The ARC projects also both use 'gadgets' to help monitor the activity of children. We will be using GPS and accelerometers – this is one of the fun parts of the research because of the data that can be collected and used to paint a picture of how and where children are active. Using GPS to monitor physical activity has been an interest of mine for a while now and it will be good to use it in a large number of participants in a range of different environments.

In the two years since winning the award I have also started to co-supervise a number of research students, both PhD and Masters. They have all been very productive working

on getting their various research projects up and running and I find it very rewarding to assist them in their research.

Receiving the award was a good surprise to receive at the conference and was a boost to my confidence as a researcher. I'm looking forward to presenting at the SMA conference again this year at Port Douglas which I think will be my ninth straight SMA conference. I always find it a good conference that is informative and fun and hopefully I can make it 10 straight in Fremantle 2011.

Cristina Caperchione

Senior Post-Doctoral Research Fellow
Institute for Health and Social Science Research
CQUniversity

MORE FUEL MEANS MORE ENERGY.



An advanced CoQ10 specialised energy supplement.

Bio-Organics® combines naturally fermented premium grade Co-enzyme Q10 (150mg) with BioActive Plus™ ingredients of Magnesium and Resveratrol.

CoQ10 is an antioxidant that naturally occurs in the body. It works in the mitochondria to help maintain the body's biochemical pathways for **energy production**. Magnesium has been added to **support energy production**. Importantly this combination may be valuable in people who exercise regularly as it **assists stamina**, **helps maintain cardiovascular health** and may **improve circulation**.

This formulation makes Bio-Organics® a great choice for your energy needs.



Extra active ingredients.

BIO ORGANICS®
The Science of Wellbeing

Always read the label. Use only as directed. If symptoms persist, consult your healthcare professional. Bio-Organics and The Science of Wellbeing are registered trademarks of sanofi-aventis healthcare pty limited ABN 43 076 651 959, 87 Yarraman Place, Virginia QLD 4014. www.Bio-Organics.com.au AD-BCQ14-610 CHC 41330-03/10

Asics Conference of Science & Medicine in Sport 2010

Port Douglas | November 4–6, 2010 | Speaker profiles

Keynote Speakers



Professor Lars Engebretsen

'Are our treatment methods in orthopaedics and sports traumatology evidence based?'

Asics Sponsored Speaker

Lars' travel to Australia is supported by Club Warehouse Sports Medical

Lars Engebretsen completed his Medical Doctorate in 1979 at the University of Oslo. In 1990 he received his PhD in Orthopaedic Surgery from Trondheim University and in 1992 was credentialed in Norway as a Certified Specialist in orthopaedics and general surgery.

Lars is a Professor at the Orthopaedic Center, Ullevål University Hospital and at the Faculty of Medicine, University of Oslo. Lars' current professional affiliations include Professor of the Norwegian College of Sports and Physical Education and the Division of Orthopaedic Surgery, University of Norway, and Co-chair of Oslo Sports Trauma Research Center. He is Consultant and Chief of Sports Medicine at the Norwegian Olympic Sports Federation Olympic Committee and Para-Olympic Committee, Head Physician for the Norwegian Olympic Center and Head of Medical Sciences for the International Olympic Committee (IOC). He was the Chief Physician for the Norwegian Olympic Team for Athens 2004, Torino 2006 and for the Norwegian Olympic Training Center.

Lars has published over 400 articles, book chapters and abstracts. He has received research grants and awards from many agencies and associations, including the National Institutes of Health, the Norwegian Council for Research in Science and Humanities, the Norwegian Ministry of Health and the American Orthopaedic Society for Sports Medicine (AOSSM).

In addition to being the current President of the European Society of Sports Traumatology Knee Surgery and Arthroscopy (ESSKA), Lars is also a member of many other societies including but not limited to the Norwegian Society of Sports Medicine, the Scandinavian Foundation of Medicine & Science in Sports, the International Society of Arthroscopy, Knee Surgery and Orthopaedic Sports Medicine (ISAKOS), the Orthopaedic Research Society, and the International Knee Society.

Refshauge Lecturer



Professor Peter Fricker OAM

'Genetics and the athlete – metaphysics, science and ethics (Part 1)'

Australian Sports Medicine Federation Fellows Sponsored Speaker

Director of the Australian Institute of Sport (AIS)

Peter Fricker is well known for his significant role as Team Doctor and Medical Director of Australian teams at five Olympic Games and six Commonwealth Games. He was appointed AIS Director in 2005.

He is Chairman of the Medical Commission of the Australian Commonwealth Games Association and a Member of the Medical Commission of the Australian Olympic Committee, and was Medical Director for the Teams to Manchester and for the Australian Team to the Athens Olympics.

Peter worked as Team Medical Officer to Australian National Junior Men's Basketball Teams to two World Championships and was Team Medical Officer to National Gymnastics Teams to World Championships.

For over 25 years, Professor Fricker has conducted groundbreaking work in key areas of sports science and sports medicine, including sports injuries, exercise and immunology, and genetics in sport. He has focused on research that supports and enhances the performance and success of Australian athletes and teams.

Official commendations include a medal of the Order of Australia (1993) and the Australian Sports Medal (2001).



Professor Bengt Saltin

'Exercise science; its role today and through a century.'

Asics Sponsored Speaker

Bengt Saltin is currently the Director of the Muscle Research Center at the University of Copenhagen

Bengt has devoted his life to researching the effects of physical exercise on health and performance. He coined the term 'humans were meant to

move' and his famous 'bed rest' study transformed medical practice on how people recover from heart attacks, general surgery, or injury. Over the years he has conducted extensive research into skeletal muscle function and training, cardiac function in athletes and patients, high level elite performance, gene-environment interactions and performance enhancing drugs. His current work focuses on exercise and diabetes. He is one of the world's most respected exercise physiologists and in 2002, he was awarded the IOC Prize, an Olympic Gold Medal, for having made the greatest contribution to our understanding of exercise for health and performance.

Opening Plenary Presentation Speaker



Dr Murray Phillips

'Reflections on the past: appraising the developments of sport medicine and sport science in Australia'

Senior Lecturer in Socio-Cultural Aspects of Sport and Physical Activity, The University of Queensland

Murray Phillips has a range of research interests in the historical and contemporary dimensions of sport. He has written on the historical and contemporary aspects of sport and war, sport and gender, sports coaching, golf, rugby league, rugby union, sport structures as well as the ontological, epistemological and methodological aspects of sport history.

With these interests in mind, Dr Phillips has received external funding from the Australian Research Council, Australian Sports Commission, the Australian Coaching Council, the Australian War Memorial, as well as internal funding from the Universities of Canberra, South Australia and Queensland. He was commissioned by the Women and Sport Unit at the Australian Sports Commission to write *An Illusory Image: A Report on the Media Coverage and Portrayal of Women's Sport in Australia 1996*, has written a history of coaching in Australia entitled *From Sidelines to Centre Field for the Australian Coaching Council*, and is currently writing the centennial history of swimming in Australia for the National Sporting Organisation, Australian Swimming. In addition, Dr Phillips has been contracted to edit a book on the ontological, epistemological and methodological dimensions of sport history that draws on the collective experience of 12 of the leading sport historians around the world.

Dr Phillips has been an Associate Editor and Book Reviews Editor for the *Journal of Football Studies* and is also on the executive committee of the Australian Society for Sport.

Invited Speaker



Dr Evert Verhagen

'The cost of sports injuries'

Senior Researcher, Department of Public and Occupational Health, VU University Medical Center, Amsterdam

Evert Verhagen, PhD (1976) is a Senior Researcher of the Department

of Public and Occupational Health at the VU University Medical Centre in Amsterdam. He is a board certified occupational epidemiologist and human movement scientist. Evert received his PhD in 2004 after emphasising the preventive effect balance training has against ankle sprains. As a former Track & Field athlete who had to cease participating at the elite level at the age of 17 due to an injury, he has a natural interest in sports and physical activity injury prevention. He gained his mark for his work on the prevention of ankle sprains, but also has a strong focus on safety and injury prevention in youth sports and physical activity, as well as the uptake of the interventions within a broad sporting population.

Evert was the project-leader of the recently completed 2BFit (Balance Board Functional instability training) study on the preventive effect of proprioceptive training given after usual care. Results of this very effective intervention have been accepted for publication in the *British Medical Journal*. He is also the instigator of the effective iPlay study (Injury Prevention Lessons Affecting Youngsters). The iPlay study evaluated a school-based intervention program aimed at preventing sports and physical activity injuries in children aged 10–12. Evert is also a current member of various Dutch 'expert' groups within the field of sports medicine, including the 'project group National Sports Database', 'the National Sports Injury Registration Platform', and 'the National Sports Injury Prevention Platform'.

The Australian Conference of Science and Medicine in Sport (ACSMS 2011) will be held at the Esplanade Hotel Fremantle, 19–22 October 2011.

sma.org.au/asics-conference/future-conferences/acsms-2011/

ASICS CONFERENCE OF SCIENCE & MEDICINE IN SPORT

PORT DOUGLAS
4-6 NOVEMBER 2010



Conference Program

Wednesday 3rd November	
Time	
0900 - 1600	AAPSM Board meeting (Il Pescatore Restaurant)
1200 - 1600	SMA Board meeting (Pandanus Room 1)
1700 - 1800	Official opening ceremony (Mirage Ballroom) Opening plenary presentation Murray Phillips <i>"Reflections on the past: Appraising the developments of sport medicine and sport science in Australia"</i>
1800 - 1900	Welcome reception (Daintree Lounge) (ticketed event)



Thursday 4th November					
Time	Mirage Ballroom 1	Mirage Ballroom 2	Mirage Ballroom 3	Pandanus Room	Il Pescatore Restaurant
0800 - 0900	Workshop: Stuart Imer <i>"Degenerative joint disease and Tendinopathy in the foot and ankle - a biomechanical and manual therapy approach"</i>	Workshop: SDrA <i>"A hands on approach to the evidence based diagnosis and management of common shoulder problems"</i>	Workshop: Susie Burrell and Chris McLellan <i>"Supplementation for peak performance - what sports science professionals need to know"</i>	Workshop: "CPR certification"	
0900 - 0930	Change over				
0930 - 1030	Keynote: Bengt Saltin <i>"Exercise science; its role today and through a century"</i>				
1030 - 1100	Morning tea (Daintree Lounge)				
1100 - 1230	TBA	Free Papers: Clinical - knee	Free Papers: Exercise physiology	Free Papers: Physical activity 1 - children	Themed poster session
1230 - 1330	Lunch (Daintree Lounge)				
1330 - 1500	Free Papers: Clinical - tendon	Free Papers: Clinical - shoulder	Free Papers: Neuromechanics	Free Papers: Physical activity 2 - adults	Themed poster session
1500 - 1530	Afternoon tea (Daintree Lounge)				
1530 - 1700	Multidisciplinary Grand Round: Lumbo pelvic, hip and lower limb	Symposium: Managing drugs in sport: The evidence base for second generation policy	Free papers: Sports science	Invited: Evert Verhagen <i>"The cost of sports injuries"</i> and Free Papers: Injury prevention and epidemiology	
1700 - 1800	Trade exhibition opening (Glade Pavilion)				
1930 - Late	ASMF Fellows dinner (ticketed event - not included in registration)				

Friday 5th November

Time	Mirage Ballroom 1	Mirage Ballroom 2	Mirage Ballroom 3	Pandanus Room	Il Pescatore Restaurant
0800 - 0900	Workshop: Trish Wisbey-Roth "Retraining graded and functional control of the hip region"		Workshop: Leo Pinczewski "Diagnosis and management of knee osteoarthritis in the middle aged athlete"	Workshop: AAPSM	Workshop: "CPR certification"
0900 - 0930	Change over				
0930 - 1030	Keynote: Lars Engebretsen "Are our treatment methods in orthopaedics and sports traumatology evidence based?"				
1030 - 1100	Morning tea (Glade Pavilion) (Trade exhibition)				
1100 - 1230	Multidisciplinary Grand Round: Upper limb, cervical and thoracic spine	Free Papers: Clinical - foot and ankle	Free Papers: Recovery and fatigue	Free Papers: Physical activity 3 - adults and Invited: Sigmund Loland "From morality and medicine to meaning: the values of a physically active life"	Themed poster session
1230 - 1330	Lunch (Glade Pavilion) (Trade exhibition)				
1330 - 1500	Free Papers: Clinical - hip and groin	Free Papers: Exercise and physical activity in chronic disease		Free Papers: Injury aetiology and prevention	Themed poster session
1500 - 1600	Afternoon tea (Glade Pavilion) (Trade exhibition)				
1600 - 1700	Physical Activity: practising what we preach				
1700 - 1900	Poster session (Mirage Ballroom and Mirage Ballroom Foyer)				
1930 - Late	Discipline Group dinners (ticketed events - not included in registration)				

Saturday 6th November

Time	Mirage Ballroom 1	Mirage Ballroom 2	Mirage Ballroom 3
0800 - 0900	Workshop: Caroline Finch <i>"What is it about context that makes the implementation of sports safety interventions difficult?"</i>	Workshop: SDrA <i>"A hands on approach to the evidence based diagnosis and management of common knee problems"</i>	Workshop: AAPSM
0900 - 0930	Change over		
0930 - 1030	Refshauge Lecture: Peter Fricker <i>"Genetics and the athlete – metaphysics, science and ethics (Part 1)"</i>		
1030 - 1100	Morning tea (Glade Pavilion) (Trade exhibition)		
1100 - 1230	Symposium: Management of the ACL injured knee	Symposium: Whole body vibration – why does it work; why does it fail	Free Papers: Physical activity 4 - adults
1230 - 1330	Lunch (Glade Pavilion) (Trade exhibition)		
1330 - 1500	QANDA		
1500 - 1530	Afternoon tea (Glade Pavilion) (Trade exhibition closes)		
1530 - 1630	"Best of the Best" Best paper winners re-present to determine Asics Medal winner for Best Conference Paper		
1630 - 1700	SMA AGM		
1900 - Late	Conference dinner (Poolside Gazebo) Theme: "SMA historical dinner" (ticketed event)		

ASICS CONFERENCE OF SCIENCE & MEDICINE IN SPORT

PORT DOUGLAS
4-6 NOVEMBER 2010

Registration Form

Contact Details

Title..... First Name..... Last Name..... DOB..... Gender M / F
 Profession / Position.....
 Organisation / Discipline Group.....
 Mailing Address.....
 Suburb..... State..... Post Code..... Country.....
 Phone..... Fax.....
 Mobile..... Email.....
 Special Requirements - Dietary, Physical etc.....

Registration Fees

Sports Medicine Australia Membership

Join SMA now to be eligible for one of the ASMF Fellows awards. Conference awards are only available to SMA members. Joining fee of \$40 waived for Conference delegates.

SMA membership is open to anyone with an interest in or direct involvement with sports medicine, sports science, physical activity promotion or sports injury prevention and a minimum three year full time tertiary degree (or studying full time for a degree for student membership).

☐ Full Member - \$195 ☐ Student Member - \$50 Sub Total AUD\$

Conference Registration

	Early Bird Registration On or before 31 July 2010	Late Registration On or after 1 August 2010	
SMA Member Registration - Full	\$650	\$750
SMA Member Registration - Student^	\$500	\$600
Non Member Registration - Full	\$890	\$990
Non Member Registration - Student^	\$600	\$700

^Student Registration: Student delegates must be full time and must supply a letter from their Head of School verifying full time status.

Registered delegates receive access to all sessions being offered during the conference. Delegates also receive entrance to the Welcome Reception, Poster Session, the Conference Dinner, lunch, morning and afternoon teas, entrance to the trade exhibition, a Book of Abstracts, which includes a detailed Conference Program, and a Conference bag.

Social Program

Costs are included in the registration fee unless otherwise noted above. For catering purposes please Tick ☒ if attending.

	Delegate Ticket	Additional Ticket	# Required	
Welcome Reception (Wed 3 November)	\$nil <input type="checkbox"/>	\$70 <input type="checkbox"/>
ASMF Fellows Dinner (Thurs 4 November)^	\$TBA <input type="checkbox"/>	\$TBA <input type="checkbox"/>
Conference Dinner (Sat 6 November)^	\$nil <input type="checkbox"/>	\$130 <input type="checkbox"/>

^Ticket includes food and entertainment only - includes some drinks

Total Payment

- ☐ Enclosed is my cheque, payable to ASMF LTD
- ☐ Electronic transfer, please quote your initial & surname as written above.
 Account Name: ASMF LTD, BSB: 082 967, Account Number: 02939 7275
- ☐ I wish to pay by ☐ MasterCard ☐ Visa
- Card # / / Expiry Date /
- Cardholder's Name.....
- Cardholder's Signature.....

- ☐ Please tick if you do NOT wish your contact details to be made available to Conference Trade Exhibitors.
- ☐ Photographs will be taken during the course of the conference for use in SMA publications and communications. If you do not wish for your photograph to be included as part of these publications or communications please tick the box

Please forward this completed form to:

ACSMS Conference Secretariat
 C/- Sports Medicine Australia
 PO BOX 78
 Mitchell ACT 2911
 Phone 02 6241 9344
 Fax 02 6241 1611
 Email acsms@sma.org.au

Notice of Annual General Meeting and call for nominations

Notice is hereby given that the Annual General Meeting of Sports Medicine Australia will be held at the Sheraton Mirage Port Douglas 6 November 2010 at 4.30PM.

Agenda

- | | |
|---|-------------------------------------|
| 1. President's welcome | 2. Roll call, apologies and proxies |
| 3. Minutes of the previous AGM | 4. Reports |
| 5. Financial statements and audit report | 6. Board election (if required) |
| 7. Appointment and remuneration of auditors | 8. Special business |
| 9. Close | |

Call for nominations – Board of Directors

Members are asked to provide nominations for positions on the Board of Directors of Sports Medicine Australia.

National Directors for:

- ACT • QLD • VIC • NT • TAS • WA

I _____ of _____

hereby nominate _____

for the position of _____
on the National Board of Directors of Sports Medicine Australia

Proposer's signature _____ Date _____

Seconder (full name) _____

Seconder's signature _____ Date _____

Nominations should reach: Sports Medicine Australia PO Box 78 Mitchell ACT 2911 or fax to 02 6241 1611

BY NO LATER THAN 5.00PM (EST) ON 24 SEPTEMBER 2010

Note to the validity of nominations to the Board of Directors of SMA

Appointment and election of National Directors

- a) Each State Branch shall elect a National Director from and by the Federation membership in their state.

The training of a Sport and Exercise Physician



Dr Steve Reid, Chairman of Training of the Australasian College of Sports Physicians explains the pathway to becoming a Specialist in Sport and Exercise Medicine.

The Autumn 2010 issue of *Sport Health* included an article by Dr John Ackerman, Censor in Chief of the Australasian College of Sports Physicians (ACSP). The piece was entitled 'The making of a Sport and Exercise Physician' and described the examination structure that must be negotiated en route to gaining Fellowship of the ACSP. This article describes the training program that is administered and run by the College. The aim of the training program is not only to ensure that registrars successfully negotiate the hurdles described by Dr Ackerman, but graduate to Fellowship with the knowledge and expertise, truly deserving the title of 'Specialist in Sport and Exercise Medicine'.

The training of Sport and Exercise (SEM) Physicians is divided into two main phases: Basic (Foundation) Training, and Advanced Training. During Basic Training the registrar is required to complete the equivalent of three years of post-graduate general medical and surgical experience in posts recognised by the ACSP Board of Censors. At least two of these three years must be spent in full time positions in accredited teaching hospitals. During this period the applicant is recommended to include attachments in the following posts:

- General medical unit.
- Accident and emergency unit.

- An orthopaedic service dealing with sports medicine related trauma.

Other useful training posts would include cardiology, respiratory or rheumatology units, supervised general practice, or a sports medicine centre.

While undertaking Basic Training it is highly recommended that intending applicants demonstrate commitment to a career in sport and exercise medicine. This could be in the form of team or event medical coverage, attendance at sport and exercise medicine conferences, or completion of relevant courses or research. Attending registrar tutorials and sitting in with ACSP Fellows is also well regarded.

After an individual has successfully completed Basic Training, and passed the ACSP Part 1 examination, he or she may apply for a place on the ACSP Advanced Training Program. Potential ACSP registrars are interviewed in October or November each year, with successful applicants being offered training posts commencing the following February (the beginning of the ACSP academic year).

Advanced Training refers to the time period after an individual has commenced the ACSP Training Program until he or she has completed all components necessary to achieve Fellowship. Each registrar is required to complete four years of accredited full time clinical experience in approved training posts. Three of these years have mandatory supervision requirements, with supervision being provided by Clinical

Training Supervisors (CTS – who are all ACSP Fellows), or ACSP Accredited Clinical Training Instructors (CTIs – Fellows of other recognised specialties, such as sports orthopaedic surgeons). The minimum supervision requirement during the first year of Advanced Training is 32 hours per week. The weekly supervision requirement is reduced to 24 hours per week during year two and 16 hours per week in year three. The fourth year of accredited clinical work does not require formal supervision, but must be completed in posts that have been approved by the ACSP Training Committee.

Registrars may spend a maximum of two years doing accredited training in any one post. Of the two remaining years of accredited training the registrar is required to spend at least one year in a different state (or on the other island in the case of New Zealand). The purpose of this 'interstate training year' is to ensure that registrars are exposed to a broad range of practice styles and patient populations, and work with a range of ACSP Fellows and accredited CTIs.

The ACSP training year commences on the first Monday of February, and this represents a busy time for the newly appointed registrar. He or she will commence supervised work in one or more training practices and then, during the first weekend in February, attend the annual ACSP Registrar Conference. This is mandatory for all registrars and is essentially an academic 'residential retreat'. It enables the registrar group and members of the ACSP Training Committee to meet over several days. The academic program features presentations by all registrars, as well as invited speakers. A social program, including a sports afternoon, allows for recreation and networking opportunities.

Throughout the Advanced Training program registrars attend weekly tutorials. A tutorial 'syllabus' is published in the College Manual to guide the subjects that need to be covered over a two year cycle. The syllabus reflects the extensive curriculum that a Sport and Exercise Physician must study en route to Fellowship. It includes diagnosis and management of acute and overuse injuries in all regions of the body, with comprehensive study of relevant clinical examination technique, and radiological investigation and interpretation. There are in depth tutorials covering medical conditions (asthma, epilepsy, cardiovascular medicine, rheumatology, renal medicine etc); how these conditions and their treatment affect exercise, and how exercise affects the conditions and their treatment. Registrars also learn about exercise as a modality for treatment and prevention in its own right (e.g. with regard to hypertension, diabetes, hypercholesterolaemia, obesity), and sport and exercise medicine as it relates to

particular populations (e.g. the paediatric or adolescent patient, paralympic sport, or exercise during pregnancy). Tutorials are based on a 44 week year to permit breaks for holidays and conference leave. They are supervised by an ACSP Fellow, or accredited CTI, but are registrar driven in terms of content. Examples of material included in tutorials are formal lectures, case presentations of interesting or difficult patients, journal reviews and practice examinations.

As well as the weekly tutorial program, registrars must complete five academic modules during advanced training. These are designed to give the registrar an advanced understanding of the concepts and principles relating to:

- Research methods
- Sports nutrition
- Sports psychology
- Sports pharmacology
- Biomechanics

The modules can be completed through any formally assessed university course that has been prospectively approved by the ACSP Training Committee.

In addition to the weekly tutorial program, registrars receive supervision from CTSs and CTIs within their training practices. In this setting the registrar is able to discuss challenging cases on a regular basis. Furthermore, this setting is used for clinically based assessments (Workplace Based Assessments) throughout the year. Two formal Workplace Based Assessment tools are currently utilised by the ACSP. The first of these is the Mini-Clinical Evaluation Exercise (mini-CEX) in which the registrar interviews and examines a new (real) patient with the CTS observing in the room. This is immediately followed by a feedback session (10–15 minutes) during which the CTS and registrar can discuss strengths and weaknesses of the consultation. The second form of Workplace Based Assessment is Direct Observation of Procedural Skills (DOPS) during which the registrar is observed performing a procedure on a real patient. The DOPS is used to assess the practical skills required for practicing as a Sport and Exercise Physician, such as common joint injections (knee, ankle, shoulder etc).

During ACSP training registrars must acquire a broad range of practical experience outside of the clinic setting. It is mandatory that they serve under the direction of an accredited supervisor as assistant medical officer to a high level AFL, rugby league or rugby union team for 12 months. This is to ensure that the registrar gains a high level of expertise in



providing the medical support necessary for the safety and well being of the team members (from pre-season planning to post-season review). In addition, trainees must gain experience in providing medical coverage and support for a wide variety of sporting events. This includes the organisation of the medical coverage for at least one major sporting event, such as an endurance event or a multi-event competition. This exposes the registrar to situations where multiple medical and paramedical staff are required, and onsite medical, communication and ambulance facilities must be coordinated.

The performance and publication of peer reviewed academic research has been fundamental to the development of Sport and Exercise Medicine as a distinct discipline. Research is also recognised by the CanMEDS competencies upon which the training program is assessed. For these reasons, research has always been a key component of ACSP training. During the training program a registrar is required to complete an original project involving basic or applied research in the field of SEM. The project must be prospectively approved, and be capable of being published in a peer-reviewed Medline recognised journal (with the registrar as first author on the resulting publication).

ACSP registrars are offered a significant support structure throughout their program. Their first contact in matters relating to planning and implementation of their training program is the State Training Coordinator (STC). As suggested by the name, an STC oversees all ACSP registrars in any one State. As such, the STC ensures that weekly education meetings are occurring, and that they are being attended. The STC

is the first point of contact if a registrar has problems with a supervisor (or vice versa), and also monitors the progress of registrars by way of six-monthly interviews.

All registrars are required to nominate a 'mentor'. This is a senior ACSP Fellow whose role is of a pastoral nature, and from whom the registrar can seek independent advice regarding problems or concerns. Discussions between mentor and registrar are confidential, and not subject to reporting back to the Training Committee of the ACSP.

Clearly, the ACSP Training Program is necessarily demanding and rigorous, as befits a Specialist College. However, every effort is made to make a registrar's experience of the Program positive and enjoyable. The ACSP is a small College (approximately 150 Fellows), and there are approximately 25–40 registrars at any one time. As a result, there is good camaraderie and peer support within the registrar body, particularly since the registrars meet as a group twice a year at the Registrar Conference, and again at the ACSP Annual Scientific Conference. The size of the College also makes it easier for Fellows and Registrars to get to know one another. Because training occurs within a private practice setting, rather than in large teaching hospitals, teaching is at a more personal level. Also, many sports in Australia now require doctors to travel with age group, as well as senior teams. Therefore, registrars on the Training Program often enjoy opportunities to travel domestically and internationally with a variety of sports, ranging from teams competitions such as netball, soccer and rugby union, through to individual sports such as swimming and triathlon.

The mission statement of the ACSP is 'To set and maintain a standard of excellence in the practice of Sport and Exercise Medicine'. This mission statement can only be upheld if the training program that is run by the College enables its registrars to acquire the knowledge and skills to practice at a Specialist standard. For this reason, a Training Committee that is comprised of senior ACSP Fellows, with input from external educational advisors, continually reviews the training program. In this way the program continues to evolve and develop in accordance with the highest academic and educational standards.

All enquiries regarding the ACSP training program should be directed in the first instance to the College office on +61 2 9223 4055 or acsp@bigpond.com

Dr Steve Reid

Chairman of Training
Australasian College of Sports Physicians



PREVENTION IS BETTER THAN CURE.

Wearing the wrong type of sports shoes can be one of the most common causes of sports injuries. Having shoes fitted correctly reduces strain on the entire body and can help your patients to avoid some common injuries. That's why at The Athlete's Foot, our staff are trained in basic foot anatomy and shoe technology to recommend the correct shoe for each and every customer. This knowledge, combined with our exclusive Fitprint® system, guarantees the most comfortable, best fitting shoes every time. To make sure the shoe fits, and fits well, refer your patients to The Athlete's Foot.

The Athlete's foot has over 120 stores across Australia and New Zealand so wherever you are, comfort is just around the corner.



www.theathletesfoot.com.au
1800 677 621

The female pelvic floor in women's artistic gymnastics



APA Sports Physiotherapist Keren Faulkner writes about pelvic floor dysfunction as evidenced by stress urinary incontinence.

Women's artistic gymnastics is characterised by very high impact forces, long training sessions and high skill repetitions. Athletes begin training at very early ages and train up to 30 hours per week at the elite level. Epidemiology studies show that low back injury is the most common injury in the sport and gymnastics training routinely incorporates lumbo-pelvic stability exercises to help address this issue.

There is a proposed contribution of the pelvic floor in facilitating stability for the lumbar spine and pelvis through regulating intra-abdominal pressure and increasing stiffness of the sacroiliac joints. Dysfunction of the pelvic floor, as evidenced by stress urinary incontinence (SUI), could indicate poor lumbo-pelvic stability. It is also conceivable that the intra-abdominal forces replicated by some gymnastics skills are so great that the pelvic floor is unable to achieve its function, making SUI inevitable. Vertical ground-reaction forces

during simple landing skills approach 15 times bodyweight and it is likely this is much greater during complex dismounts.

In trampoline sports, it has been demonstrated that 80 per cent of elite female athletes, with a mean age of 15 years, report involuntary urinary leakage during trampoline training. This correlated with more challenging skills and to the number of years of elite level training¹⁻². Athletes in this study also reported greater leakage towards the end of a training session, indicating reduced muscular endurance. Leakage was related to particular skills for 28 per cent of athletes. Reported coping strategies included protective pads, frequent toilet visits and limiting fluid intake.

Another study investigated the ultrasonography of pelvic floor musculature of athletes involved in high impact, intense and frequent training³. This sample group included gymnasts along with other female elite athletes from sports like aerobics, basketball and tennis. The investigators demonstrated increased mean diameter of pubovisceral muscles and greater bladder neck descent on valsalva for the athlete group

compared with matched controls. This study shows that these athletes have adapted to training loads by increasing pelvic floor musculature. There may also be some increased laxity of non-contractile elements as a result of high impact training.

In Denmark, a survey was developed to monitor urinary incontinence in a range of elite female athletes⁴.

Gymnasts reported the highest rate of SUI at 56 per cent over other sports like ballet (43 per cent), aerobics (40 per cent), badminton (31 per cent) and volleyball (30 per cent).

The activity across all sports most likely to provoke leakage was jumping, although it is unclear whether the leakage occurs during take-off or landing.

Gymnastics Australia is currently supporting an anonymous survey of junior artistic gymnasts which is based on surveys used in other sporting populations. We are particularly interested in behaviours which are considered normal in the sport but may not promote normal pelvic floor function. This might include frequent urination during training, reduced fluid intake, routine bladder emptying before challenging skills or wearing protective pads.

In my experience with women's artistic gymnastics, I do feel that stress urinary incontinence is an issue for elite athletes. I note frequent bathroom trips during training, especially prior to challenging skills like floor tumbling. Athletes report minor SUI on landing forward tumbling skills and I suggest this is a result of both the vertical ground reaction force combined with postero-anterior horizontal ground reaction force, placing maximal load on the anterior pelvic floor. Gymnasts also reduce fluid intake and I feel that maintaining an empty bladder is seen as the easiest way to prevent SUI by these athletes.

In men's gymnastics, landing forces are greater as athletes are generally heavier, perform more complex tumbling skills of a greater magnitude and dismount from higher apparatus (rings and high bar are 10 foot). There are no studies investigating pelvic floor function, possibly because SUI is not reported amongst male gymnasts. While the pelvic floor musculature is most likely exposed to significant stress and adaptation, and dysfunction may result, incontinence is not a symptom. I believe this is due to the anatomical advantage of the longer male urethra, contributing to enhanced control. So in male gymnasts, pelvic floor dysfunction is more likely to result in symptoms like lumbo-pelvic pain rather than SUI.

Low back pain and sacro-iliac symptoms are common in both men's and women's gymnastics and it is likely that pelvic floor dysfunction is a factor. Current prevention is based around encouraging lumbo-pelvic stability

and postural awareness through a variety of exercises, including TA isolation, movement awareness drills, ballet, yoga and Pilates. Coach and athlete education incorporates discussion of pelvic floor function, symptoms to be aware of and exercises to elevate the pelvic floor in both a tonic and dynamic fashion. Uptake of these exercise programs is variable and depends upon the coach having a strong appreciation for the benefits. Individuals with symptoms are referred to a women's health physiotherapist.

Longitudinal research is required to investigate the longer term consequences of high impact sport on pelvic floor function. It could be hypothesised that muscular adaptation to load (i.e. hypertrophy) may be reversible following retirement while any changes to the non-contractile elements supporting the pelvic floor musculature may remain. This could lead to higher rates of incontinence later in life. There is currently no relevant research or anecdotal information collected regarding gymnasts following retirement.

Armed with information from the current Gymnastics Australia survey, we will be well placed to direct further related research. Physiotherapists interested in being involved are encouraged to visit www.gymnastics.org.au to contact us or for more information about gymnastics (follow links to 'Technical Information' and 'Sports Science and Medicine').

Keren Faulkner

APA Sports Physiotherapist

Worked for gymnastics Australia since 2003

Attended Olympic Games – Athens, Beijing;

Commonwealth Games – Melbourne; and

World Championships with national team

Area of interest – injury prevention

References

- 1 Eliasson, Edner and Mattson (2006). Urinary incontinence in very young and mostly nulliparous women with history of regular organised high-impact trampoline training; occurrence and risk factors. *Int Urogynecol J Pelvic Floor Dysfunct.* May 19(5): 687–96.
- 2 Eliasson, Larsson and Mattson (2002). Prevalence of stress incontinence in nulliparous elite trampolinists. *Scand J Med Sci Sports.* Apr; 12 (2); 106–10.
- 3 Kruger, Dietz and Murphy (2007). Pelvic floor function in elite nulliparous athletes. *Ultrasound Obstet Gynecol.* Jul; 30(1) 81–5.
- 4 Thyssen, Clevin, Olesen and Lose (2002). Urinary incontinence in elite female athletes and dancers. *Int Urogynecol J Pelvic Floor Dysf.* 13(1); 15–17.

Discipline group news and events

Australasian Academy of Podiatric Sports Medicine (AAPSM)

AAPSM has held a successful roadshow in Sydney, Melbourne and Brisbane, with Dr Doug Richie as keynote speaker, supported by Simon Bartold. Approximately 300 registrants heard the latest on the adult acquired flat foot, barefoot running, research on sporting footwear, and many other topics around the informal fireside chat at the end of each day.

In other news, the administration duties for AAPSM are now being managed by Sports Medicine Australia, the Board is targeting new Fellowship guidelines to bring the award to an acceptable standard for 2010 and the future, and a new website is being planned.

In regards to events, AAPSM is looking forward to Port Douglas in November 2010 and the 2011 Conference to ensure members receive more of the quality experienced at the recent roadshow.

For more information visit www.aapsm.org.au

Australasian College of Sports Physicians (ACSP)

Upcoming events

October 24–27, 2010
25th ACSP Annual Scientific Conference
Couran Cove Island Resort
South Stradbroke Island, QLD

March 6, 2011
ACSP Clinical Sports Medicine
Sydney, NSW

For more information visit www.acsp.org.au

Australian Psychological Society (APS)

The 2010 APS Annual General Meeting is being held in conjunction with the NSW State Convention.

October 16, 2010

4.30pm

Sydney Masonic Conference (SMC) and Function Centre
66 Goulburn Street, Sydney, NSW

For more information visit www.psychology.org.au

Exercise and Sports Science Australia (ESSA)

From July 1, 2010 ESSA is implementing changes to the practicum requirements for exercise physiology and the exercise scientist (ES) full member application forms. These changes will ensure members have the necessary knowledge and skills to meet industry requirements.

The areas of study required for ES full member applications have been taken directly from the National University Course Accreditation Program (NUCAP) guidelines. NUCAP is the ESSA program that accredits university courses in exercise and sports science.

A summary of the changes can be viewed at www.essa.org.au.





Sports Dietitians Australia (SDA)

From July 1, 2010 SDA's Career Development Pathway (CDP) will move to Phase 2 – the activation of compulsory membership criteria.

To be an SDA Accredited Sports Dietitian, members must meet the following four criteria:

- Two years minimum clinical experience from graduation date
- Completion of SDA's four day Sports Nutrition Course
- Full DAA membership
- Minimum 250 CDP points

Upcoming events

- June 19: NSW Nutrition for exercise and sport course – Sydney
- July 3: ACT Nutrition for exercise and sport course – Canberra
- July 31: SA Nutrition for exercise and sport course – Adelaide
- August 21: VIC Nutrition for exercise and sport course – Melbourne
- September 4: QLD Nutrition for exercise and sport course – Gold Coast
- October 30: WA Nutrition for exercise and sport course – Perth

For more information visit www.sportsdietitians.com.au

Sports Doctors Australia (SDrA)

SDrA is continuing discussions with RACGP regarding the Faculty of Special Interest in Sports Medicine, to ensure equity for all our members. As negotiations and the process evolves, regular updates will be posted on www.sportsdoctors.com.au

SDrA will be making a substantial contribution to the upcoming GP10 conference www.gp10.com.au being held in Cairns between October 6–9, 2010. A significant component of the conference will be dedicated to sports medicine with all sessions being run by SDrA members. We encourage all SDrA members and GPs with a special interest in sports medicine to attend as the sessions will be clinically related and relevant to day-to-day primary care presentations.

For more information visit www.sportsdoctors.com.au





Sports Medicine Australia continues to be Australia's leader in the training of sports trainers and sports first aiders. Over 5,000 sports trainers are accredited by SMA annually and over 15,000 sports trainers and sports first aiders form part of this network of volunteers throughout the nation.

The vast majority of these trainers ply their trade within the community levels of grassroots sport providing a vital, yet sometimes thankless service.

Whilst stakeholders at all levels of community sport including coaches, administrators, parents and players, appreciate the effort and support provided by sports trainers, Sustagen Sport, in partnership with Sports Medicine Australia last year set out to provide recognition of these invaluable services.

Implementing the Sustagen Sport – Sports Trainer of the Year initiative in 2009, the program recognised some of the outstanding work being done by many of our unsung heroes at all levels of support.

In their search, Sustagen came across a plethora of worthy recipients and had no trouble awarding the monthly prize of \$500 worth of Sustagen products and recognition plaques.

The overall winner and 2010 Sustagen Sport Sports Trainer of the Year, Taryn Cummane is reflective of the quality role community sports trainers are playing.

Taryn works with the reserves and seniors at the Chirside Park Football Club who competes in Victoria's Eastern Football League.

She was selected for the way she used the knowledge gained through completing the Sports Medicine Australia Sports Trainers and First Aid courses to educate the players with advice throughout the season.

After a number of players commented on cramping and the lack of energy they had early in games, Taryn did further

research and put together a small booklet to inform players of the importance of hydration and nutrition. Containing a number of tips and advice the booklet highlighted the types and amount of fluid and food to consume in the lead up, during and after games.

As a result many of the players noticed a difference in their performance and at the end of the year they achieved the ultimate goal of a Senior Premiership!

As Taryn and Chirside Park's football season has recommenced in 2010, so has the sports trainer initiative, this time titled the Community Sports Trainer of the Year.

We're certain that Taryn is just one of the many examples of how sports trainers are impacting on the health and ongoing participation of players and their wider communities.

Sustagen would love to hear more such stories and all Sports Medicine Australia accredited sports trainers are encouraged to tell us how they're assisting their team to perform at their peak by completing the entry form which can be found at www.sustagensport.com.au (follow the link to Trainer of the Year).



Taryn on left



Top 10 hottest articles of the *Journal of Science and Medicine in Sport* January to March 2010

The *Journal of Science and Medicine in Sport*, published by Sports Medicine Australia (SMA), is the major refereed research publication on sport science and medicine in Australia. The Journal provides high quality, original research papers to keep members and subscribers informed of developments in sports science and medicine. Produced for SMA six times a year by Elsevier Australia, it reflects SMA's commitment to encouraging world-class research within the industry, and its commitment to the continuing education of its members. Journal articles can be found at jsams.org

The following highlights the most popular article downloads at jsams.org over recent months.

1. Negative effect of static stretching restored when combined with a sport specific warm-up component
Vol. 12, Iss. 6, November 2009, pgs. 657–661
Taylor, K.L.; Sheppard, J.M.; Lee, H.; Plummer, N.
2. Predictability of physiological testing and the role of maturation in talent identification for adolescent team sports
Vol. 9, Iss. 4, August 2006, pgs. 277–287
Pearson, D.T.; Naughton, G.A.; Torode, M.
3. Maximising performance in triathlon: Applied physiological and nutritional aspects of elite and non-elite competitions
Vol. 11, Iss. 4, July 2008, pgs. 407–416
Bentley, D.J.; Cox, G.R.; Green, D.; Laursen, P.B.
4. Does plyometric training improve strength performance? A meta-analysis
Vol., Iss., pgs. n/a
Saez-Saez de Villarreal, E.; Requena, B.; Newton, R.U.
5. Anthropometric and fitness characteristics of international, professional and amateur male graduate soccer players from an elite youth academy
Vol. 13, Iss. 1, January 2010, pgs. 90–95
le Gall, F.; Carling, C.; Williams, M.; Reilly, T.
6. The effects of compression garments on recovery of muscle performance following high-intensity sprint and plyometric exercise
Vol. 13, Iss. 1, January 2010, pgs. 136–140
Duffield, R.; Cannon, J.; King, M.
7. Effect of water immersion methods on post-exercise recovery from simulated team sport exercise
Vol. 12, Iss. 3, May 2009, pgs. 417–421
Ingram, J.; Dawson, B.; Goodman, C.; Wallman, K.; Beilby, J.
8. Strength and conditioning in tennis: Current research and practice
Vol. 11, Iss. 3, June 2008, pgs. 248–256
Reid, M.; Schneiker, K.
9. The effects of multidirectional soccer-specific fatigue on markers of hamstring injury risk
Vol. 13, Iss. 1, January 2010, pgs. 120–125
Small, K.; McNaughton, L.; Greig, M.; Lovell, R.
10. Vertical jump in female and male basketball players. A review of observational and experimental studies
Vol. 13, Iss. 3, May 2010, pgs. 332–339
Ziv, G.; Lidor, R.

Podcasts

Listen to interviews with authors discussing their work and the latest from JSAMS, via podcast at jsams.org or through iTunes by searching *Journal of Science and Medicine in Sport*.



Awful tooth about sports drinks



Complicated, lengthy and expensive dental treatment can result from frequent and excessive consumption of sports drinks, bottled water, fruit juices and sports gels. Dentist, John Banky explains.

For some time, dental professionals have been concerned about an increasing incidence of dental problems amongst sports participants and increasing rates of tooth wear, particularly dental erosion, affecting all ages – from pre-school children through to adults. Sports drinks and the like play a role which is worrying as they are not only being consumed by electrolyte-depleted athletes but also individuals who are simply thirsty.

Tooth surface dissolution due to high sugar foods and dietary acid results in dental decay, dental erosion or both. Dental erosion is the main cause of the visible, hard, outer covering of teeth (enamel) softening. Further dental tissue loss occurs by attrition (tooth to tooth contact) and abrasion (loss of dental hard tissue by physical means such as direct action of abrasive substances) eventually exposing or removing more underlying tooth material (dentine)¹.

An Australian survey in 2007 found nearly 70 per cent of 714 students aged 6–15 years in eight schools had at least one tooth with excessive wear², compared with 41 per cent in the United States³ and 51 per cent in the United Kingdom⁴. The increased rate of erosion has been linked to the growth in consumption of dietary acidic intake particularly soft drinks, fruit juices and sports drinks, often at the expense of dairy products⁵.

Signs of dental erosion include:

- Hollow defects on the cusp tips/loss of surface detail on the chewing (occlusal) surfaces of posterior teeth.
- Fillings in affected teeth appearing to 'stick out' of the tooth surface due to the surrounding tooth structure being dissolved.
- Thinning/chipping of the biting (incisal) edges of the anterior teeth.
- Thinned outer enamel layer of affected teeth so the underlying grey/brown tooth colour is more noticeable.
- Tooth sensitivity to hot/cold or sweet for the duration of contact with affected tooth surface.

Both enamel and dentine are weakened by the irreversible loss of dental hard tissue which commences within five minutes of the tooth surface contacting an acidic solution⁶ continuing until normal salivary flow dilutes, neutralises and washes away the acidic solution. Dental decay and tooth erosion are the clinical effects of tooth mineral dissolution.

The erosive potential of drinks is determined by:

- **pH** – enamel is at risk of mineral dissolution when the pH of a solution in contact with it is less than 5.5 (**critical pH**). Dentine is also demineralised (weakened) by acid. The enamel layer in primary teeth is thinner making them particularly vulnerable⁷. Low pH does not affect gastric emptying or absorption rate⁸ yet commercially prepared

sports drinks' pH is 2.4–4.5, well below the **critical pH** (5.5) hence the concern about damaging teeth.

- **Acid buffering capacity (titratable acid content)⁹** – the greater the buffering capacity of the drink the greater the volume of saliva required to neutralise the acid. The titratable acid content is directly affected by food additives such as carbonic acid (the reaction product of water and carbon dioxide when drinks are carbonated), malic acid, tartaric acid, ascorbic acid (fruit acid 300), citric acid (food acid 331) and phosphoric acid (food acid 338). Citric acid combines with and removes the calcium in the tooth weakening it. Phosphoric acid is a major component of both 'regular' and 'diet' cola drinks. Reviewing the inclusion of these additives in drink formulations could reduce the erosion risk¹⁰.
- **Frequency and duration of exposure** – when acidic liquid contacts tooth surface a sudden, rapid drop of pH occurs at the tooth surface which then slowly rises over the next 20–30 minutes (recovery phase) due to neutralisation and clearance of acidic solution by normal salivary flow. During this time the mineral content which has been dissolved is replaced if adequate saliva (containing calcium and phosphate) is available. Another exposure to acidic solution during this time causes another rapid drop in pH extending the total period of tooth surface demineralisation. Swishing the solution around the mouth retains the acid solution prolonging contact time between acid solution and tooth surface.
- **Sugar content** – high sugar content provides energy. In cola 'premix' however it makes colas 'sticky' more to teeth than saliva, posing a risk to teeth¹⁰.

The role of saliva

Saliva controls the pH of the oral cavity protecting the teeth from erosive beverages by¹¹:

- Dilution and clearance of potentially erosive liquids from the mouth.
- Neutralisation and buffering of dietary acids due to bicarbonate.
- Maintaining a solution of calcium and phosphate in contact with the tooth surface for remineralisation (tooth surface re-hardening).

The risk of dental decay is increased by:

- **Any material which is 'sticky' or has a honey-like consistency** – this adheres to tooth surface delaying

clearance from the mouth by swallowing, tongue action and flushing by saliva. While in the mouth this material provides substrate for conversion into acid by oral bacteria.

- **Frequent or continual consumption of food with a high sugar content** – this extends acid attack on exposed tooth surface providing abundant substrate for conversion into acid by oral bacteria.
- **Reduced salivary flow** – this extends the duration of acid attack on tooth surfaces by delayed clearance of substrate (food debris) from the mouth as well as ineffective neutralisation and buffering of the acidic solution.

Risks for sports participants

- **'Water chaser' myth** – a mouthful of water immediately following a mouthful of sports drink does not prevent dental erosion. Water contains no bicarbonate, calcium or phosphate so while some of the solution may be washed away no acid neutralisation or surface remineralisation occurs.
- **Dry mouth, reduced salivary volume and quality** – saliva contains bicarbonate which neutralises the acidic solution, and calcium and phosphate to re-mineralise softened tooth surface^{12,9,13,14}. Mouth-breathing is common during physical activity which can cause a dry mouth. Prolonged high-intensity exercise reduces salivary flow¹⁵ lowering saliva bicarbonate content limiting acid solution neutralisation at tooth surface¹¹. It can take up to 30 minutes for pH in the mouth to return to a normal level with low salivary flow.¹⁶ Until this happens surface damage occurs.
- **Low pH liquids** – liquids with a pH of less than 5.5 include sports drinks, energy drinks (2.4–4.5), commercial fruit juices (3.4–3.6), carbonated mineral water, cola and non-cola soft drinks (2.5–3.6) (13). These products also contain food additives which determine the volume of saliva required to neutralise the acid (titratable acid content)⁹. Changing some of these additives could reduce erosive potential¹³ so that less saliva (as in 'dry mouth' or dehydrated athletes) is required to neutralise the acidic solution.
- **Frequent exposure to low pH liquids** – minimising net fluid loss amongst sports participants is achieved by frequent and regular drinking/sipping. During training and competition participants may have a dry mouth due to mouth breathing or be dehydrated reducing salivary flow. Low salivary flow extends the time acidic solution residue remains in contact with tooth surface. Frequent sipping of low pH liquid at intervals of 15–25 minutes causes another rapid drop in pH (while pH is still below 5.5) extending time for tooth surface demineralisation to occur.

- **Carbohydrate and sugars in sports gel** – these provide ideal substrate for acid production by oral bacteria. The ‘sticky’ consistency adheres to tooth surface further delaying clearance from the mouth particularly if salivary flow is low. (Gels are consumed 45–60 minutes into the event when the athlete may have a dry mouth due to dehydration).
- **Not consuming water with sports gel** – if low pH fluid (sports drink) is consumed instead of water the pH at tooth surface is kept low for much longer further increasing the risk of tooth damage. The total acid volume at the tooth surface consists of low pH sports drink and oral bacteria converting gel carbohydrate to acid.
- **Brushing teeth within 30 minutes of consuming a sports drink** – delay brushing for at least 30 minutes after consuming a sports drink to prevent further damage as tooth surface is still soft. The frequent use of highly abrasive toothpastes (e.g. smoker’s toothpaste) by some health/aesthetic conscious individuals may also result in the removal of the outer layer of tooth enamel¹⁷.
- Training and hydration regime should be discussed with your dental professional who can also advise on the use of neutralising products, fluoride varnishes, gels or rinses, remineralising agents such as CPP-ACP (a milk derivative) which is now being added to chewing gum, lozenges, mouthwashes or milk to re-harden tooth surfaces. Regular dental review detects early damage to teeth minimising problems.
- Be aware that the salt and caffeine content in sports and energy gels is of concern for low body mass individuals (e.g. children) consuming these products as it is with soft drinks, cola drinks and energy drinks¹⁹.

John Banky

Dental Surgeon, Melbourne

Member

Australian Dental Association,

Sports Medicine Australia

References

- 1 Young G. The oral medicine of tooth wear. *Australian Dental Journal* 2001;46;236–250.
- 2 Kazoullis S, Seow WK, Holcombe T, Newman B, Ford D. Common dental conditions associated with dental erosion in schoolchildren in Australia. *Paediatric Dentistry* 2007; 29; 33–39.
- 3 Deery C, Wagner ML, Longbottom C, Simon R, Nugent ZJ. The prevalence of dental erosion in a United States and a United Kingdom sample of adolescents; *Paediatric Dentistry* 2000; 22; 505–510.
- 4 Al-Dlaigan YH, Shaw L, Smith A. Dental erosion in a group of British 14 year old school children. Part 1: Prevalence and influence of differing socioeconomic backgrounds. *British Dental Journal* 2001;190;145–149.
- 5 Hamack L, Stang J, Story M. Soft drink consumption among U.S. children and adolescents: Nutritional consequences. *Journal of the American Dietetic Association* 1999; 99; 436–441.
- 6 Seow WK, Thong KM. Erosive effects of common beverages on extracted premolar teeth. *Australian Dental Journal* 2005;50;173–178.
- 7 Smith AJ, Shaw L. Baby fruit juice and tooth erosion. *British Dental Journal* 1987;162;65–67.
- 8 Maughan RJ, Leiper JB. Limitations to fluid replacement during exercise. *Canadian Journal of Applied Physiology* 1999; 24; 173–187.
- 9 www.foodstandards.gov.au/consumerinformation/additives.cfm accessed 5.5.2010.
- 10 Owens BM. The potential effects of pH and buffering capacity on dental erosion. *General Dentistry* 2007;55(6);527–31.
- 11 Young G. Tooth wear: diet analysis and advice. *International Dental Journal* 2005; 55; 68–72.
- 12 Cochrane NJ, Cai F, Yuan Y, Reynolds EC. Erosive potential of beverages sold in Australian schools. *Australian Dental Journal* 2010; 54; 238–244.
- 13 Lussi A, Jaeggi T, Zero D. The role of diet in the aetiology of dental erosion. *Caries Research* 2004;38;34–44.
- 14 Gedalia C, Dakuar A, Shapira L, Lewinstein I, Goultschin J, Rahamin E. Enamel softening with Coca-Cola and rehardening with milk or saliva. *American Journal of Dentistry* 1991; 4; 120–122.
- 15 Chicharro JL, Lucia A, Perez M, Vaquero AF, Urena R. Saliva composition and exercise. *Sports Medicine* 1998;26;17–27.
- 16 Tenuvuo J, Rekola M. Some effects of sugar-flavoured acid beverages on the biochemistry of human whole saliva and dental plaque. *Acta Odontologica Scandinavica* 1977; 35; 317–330.
- 17 Amaechi BT, Higham SM. Dental erosion: possible approaches to prevention and control. *Journal of Dentistry* 2005; 33; 243–252.
- 18 Schneyer LH, Pigman W, Hanrahan L, Gilmore RW. Rate of flow of human parotid, sublingual and submaxillary secretions during sleep. *Journal Dental Research* 1956;35(1); 109–114.
- 19 Keast RSJ, Riddell LJ. Caffeine as a flavor additive in soft-drinks. *Appetite* 2007; 49; 255–259.

Minimising dental problems – some top tips

- Tap water is appropriate for children and athletes participating in low intensity activity. Sports drinks should be used carefully by athletes only for intense physical activity of more than 60 minutes duration.
- When preparing sports drinks from powders do not use less water than specified in the instructions.
- Reduce the consumption/frequency and contact time of acidic beverages. Swallow acidic drinks immediately do not hold or swish them in your mouth. Drinking acidic beverages via a straw also reduces contact with teeth.
- Do not use sports drinks as a mouthwash. Do not rinse your mouth with sports drink before inserting your mouthguard. Rinse mouthguards only in water.
- Drink water with sports/energy gels not sports/energy drinks.
- The teeth of dehydrated athletes consuming several high glycaemic index foods during post-training or post-competition recovery may also be risking dental decay from reduced salivary flow compromising tooth surface protection.
- Do not consume acidic foods or beverages immediately before bed as salivary flow is minimal during sleep¹⁸.
- Fluoride, bicarbonate and calcium added to sports/soft drinks reduces their erosive potential but may also affect their taste.

Keep 'em moving.



Voltaren[®]
The Joy of Movement



Don't let muscle pain call game over. Voltaren Emulgel is a medicated anti-inflammatory rub that is clinically proven to penetrate the site of pain and help reduce swelling in soft tissue injuries. It's cool to apply and concentrates its action where it's needed most to help get them moving again.

Always read the label. Use only as directed. If symptoms persist see your healthcare professional.

Sponsors of
 **SPORTS
MEDICINE
AUSTRALIA**



sound mind sound body

running cleanses the mind and body

asics