The results are in: SMA’s
Member survey

Lack of follow up
The biggest problem of our health system

Concussion
The new rules

• AFL Injury Report 2010
• Paper vs internet: which works best?
• Performance medicine physiotherapy
• Sports medicine in rural Australia
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SMA Member research
And the results are…

“Generally members are satisfied with their SMA membership. Seventy percent of members surveyed indicated that they were either satisfied (51%) or extremely satisfied (19%).”

But before any discussion of the research and the results, a huge thank you to each and every member who took the time to respond to the survey. The response rate is a very positive indication that there are many members who have a great passion for the organisation which is approaching its 50th year. Whilst the responses don’t represent the views of the entire membership, the information will assist in shaping the services and benefits offered to members in the future.

All types of members were surveyed including full professionals, fellows, graduates, students, sports trainers and associates, and responses were generally proportionate to gender representation and membership representation across all States and Territories. Similarly representation from numerous professions reflective of SMA’s multidisciplinary profile was also evident.

Generally members are satisfied with their SMA membership. Seventy percent of members surveyed indicated that they were either satisfied (51%) or extremely satisfied (19%). A mean score of 3.84 (out of five) would suggest that members generally rate their SMA membership as valuable.

“The three main reasons for joining were professional development/training (49.7%), access to resources/educational material/information (46.9%) and finally conferences and events (42%).”

Reasons for joining SMA and continuing membership were wide and varied and respondents were offered 17 different options to respond with. The three main reasons for joining were professional development/training (49.7%), access to resources/educational material/information (46.9%) and finally conferences and events (42%). Interestingly these three options were also key reasons for membership continuation for most members.

Publications were also of great interest given the great number of contributions to our many and varied member publications.

SMA CEO, Nello Marino, discusses the results of the recent SMA Member survey.

Members with an email address would have recently been invited to take part in an SMA member survey. The survey sought to provide SMA Management with a better understanding of why members join, why they stay members and why they allow their membership to lapse.

Almost 30% of invited members responded to the survey which we are delighted to learn is above industry standard for this type of research. This survey is the most extensive research conducted on the SMA membership for some years and will provide us with invaluable data to support the provision of improved and more tailored member services across the organisation in the future.

Sports Medicine Australia is pleased to announce a new partnership with DJO Global, the leading global provider of high-quality, orthopaedic devices, with a broad range of products used for rehabilitation, pain management and physical therapy. Nello Marino is pictured with DJO Global’s Compex Muscle Stimulator.

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

“Resources” which includes the many and varied fact sheets.

Whilst this is a positive response to JSAMS which recently
achieved an improved Impact Factor and ranking score (see page 68), it also suggests that many of our members are unaware of the information resources available to them.

Improvements to publications were also suggested. Most notably members sought more information specific to their area of ‘interest’ which would suggest either more discipline specific content or greater exploration of our members’ interests is required.

“... a very large proportion of respondents (72%) indicated that they do not currently use the SMA logo on their website, business card or other similar branding opportunity.”

SMA’s online presence was also scrutinised and it is highlighted that this is an area requiring clear improvement. Most of the SMA National website features including content, navigation and look rated in the moderate to valuable range. However it is clear that a number of members feel this is an area of underperformance and requires improvement. This is particularly so in the ‘member portal’ and member directory areas of the site.

Our member benefits program was also an area in which the response was resounding. Member benefits, which include a number of third party products and services available to members at a discounted price, were generally unknown to members as reflected by low uptake and obvious low awareness. Again this is another area which will require significant review.

Finally a very large proportion of respondents (72%) indicated that they do not currently use the SMA logo on their website, business card or other similar branding opportunity.

Whilst the information presented in this article is not an exhaustive description of the results, they are an initial component of feedback to our members and the sports medicine community. More importantly it is what comes next that really counts and our readers can rest assured that the results will be used to forge a comprehensive membership strategy which will provide improved service and value to SMA members.

Most notably it is critical that we continue to alert, inform and provide every opportunity for members to advance their expertise and skills. We will use the information to develop a comprehensive membership retention, recruitment and fulfillment strategy, however in the short term we anticipate some fairly prompt action particularly in the area of professional development and improved exposure and accessibility to SMA resources.

Follow SMA CEO
Nello Marino on Twitter @smaceo

Sports Medicine Australia says importance of trained sport personnel highlighted by tragic rugby union on field accident
http://t.co/KbHl5DK – July 18, 2011

Sports injury accounts for more than twice the number of hospital treated injuries than road traffic accidents
http://t.co/ctiplqx – June 28, 2011

SMA is calling on all major ski resorts to implement a mandatory helmet policy for ski instructors, to improve safety
http://t.co/V0wu4kO – June 28, 2011

Great concussion article by Sam Lane highlights the pressure felt by all athletes with injuries
http://t.co/L0wPJxB – June 26, 2011

Most afterschool activities undertaken by 10–14 year olds are sedentary with TV topping the list, a JSAMS study shows
http://t.co/b2fT9eR – June 22, 2011

Shane Brun from SMA says link between migraine, i.e. Wallaby Berrick Barnes and continuous blows to the head is cloudy
http://t.co/Gg62oEw – June 15, 2011

The harder NFL rugby league players train, the more injuries they will sustain, according to a recent JSAMS study

Attention Sports Medicine Australia members. June 2011 member benefits now available. Check out

Know your football codes? Podcast with Aaron Coutts-Sports Science Advisor, Carlton FC and Paramatta Eels

Winter is here! SMA encourages correct cold weather preparation to prevent winter sports injuries http://bit.ly/me9cOQ – June 1, 2011

We appreciate the effort that our members have made to provide the necessary feedback to critically inform us of our strengths, weaknesses and the opportunities that these present us in the future.

Nello Marino
Chief Executive Officer
Sports Medicine Australia
nello.marino@sma.org.au
Where do you work?

My main job is as the Executive Officer of the Sports Medicine Australia Queensland Branch (SMA QLD), though with the disappointing elimination last year of funding from the State Government (that SMA QLD used to receive) and the resulting restructure I have started doing some work for the SMA National Office. I also have a part-time adjunct position with the Faculty of Health Sciences and Medicine at Bond University.

What does your typical day consist of?

Given that the role of a not-for-profit organisation manager has many components I’m not sure there is such a thing as a typical day! Primarily though my job is to make sure the SMA strategic plan, as set by the Board of Directors, is executed effectively and efficiently. I also spend a lot of my time either meeting with people from sporting, health or education organisations and providing advice about safer sport and physical activity via phone/email.

What is your favourite aspect of your job?

I love that what SMA does improves people’s health and wellbeing and that this has positive effects for individuals and society as a whole. The fact that we can institute recommendations and strategies that have an increasingly strong evidence base for their effectiveness makes this even more satisfying.

What has been the highlight of your career?

Being appointed as the Director of Physiotherapy for the Sydney 2000 Olympic and Paralympic Games. While this was nominally a part-time role, and unpaid I hasten to add, it was a vast undertaking that stretched me to my limits but ultimately was immensely satisfying. Over a period of 8 weeks 530 volunteer physiotherapists provided just under 5,000 treatments across 63 different venues to visiting athletes without any adverse outcomes, and in fact received huge praise for the quality of care and commitment of all who were involved. It was a very proud time and spoke volumes for the skills and character of Australian physiotherapists.
When, why and how did you become involved with SMA?

I started attending SMA courses/conferences and reading SMA publications in 1983, straight after graduation, because I soon realised what I had learned in my physiotherapy degree was not enough to make me a good sports medicine practitioner. The SMA multi-disciplinary approach was vitally useful in gaining knowledge about other aspects of sports medicine. Additionally, the networking SMA provided was pivotal in making enduring connections that resulted in securing both work experience and paid work with sporting teams initially which I was then able to build on, especially later.

Tell us about your work with SMA courses.

Currently I am involved in delivering the SMA Safer Sport Program courses to the local community and in addition am involved in the development of a course in conjunction with the IOC for physiotherapists from the Oceania region. One of the great things about the Olympics is the commitment to providing an enduring legacy, in this case by improving the skills and knowledge of physiotherapists from developing countries, who in turn can institute more effective sports injury prevention and management strategies in their local communities. Another area I’m involved in is the development of a delivery model or models for the new Certificate III Sports Trainer qualification that has recently been endorsed as a new qualification under the Australian Qualification Framework, including how this qualification will fit in with SMA Sports Trainer accreditation.

What are you passionate about?

Doing things, whether they be career, hobbies or family activities. My motto is that life is not a spectator sport and I’ve tried to live that by having a go at a lot of different things. As well as greatly enjoying sport and physical activity I’m also passionate about playing music and have been involved in various bands and music groups most of my life. I also am very interested in anthropology, history and archaeology.

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

Unfortunately I mustn’t have been listening at the time because I can’t remember anything at the moment!

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

Too hard, but one would be Dennis Lillee, my cricket hero and my inspiration for wanting to be a fast bowler which resulted in registering myself for cricket when I was 13. Later on he became someone I often refer to when talking about what sports medicine and sports science can achieve, given how important this was in his career after his injury. Maybe Paul Keating, too, along with someone he didn’t like or agree with to see what he would come up with in conversation.

Favourites

Travel destination: Anywhere in Australia, the best country on the planet. I also love visiting my wife’s homeland of Cyprus, and also the UK.

Sport to play/watch: Cricket was my main sport and I played it for 30 years. I LOVE watching test cricket and make no apologies for that, most people don’t get it but having played the game I do. Other sports I’ve competed in include soccer, hockey, judo, tennis and motocross.

Cuisine: Greek, Italian, Indian, Mexican, and most of the others!

Movie: Blade Runner.

Song: 40 by U2.

Book: The Grapes of Wrath by John Steinbeck.

Gadget: I just got an iPad2 and so far I think it’s great.
ARE YOU TAKING FULL ADVANTAGE OF YOUR SMA MEMBERSHIP?

“My career in sports medicine has been significantly **ENHANCED** by the great **KNOWLEDGE, NETWORKING** and professional **SUPPORT** that **SMA** provides.”

*Trish Wisbey-Roth, SMA Member
Olympic and Specialist Physiotherapist, Bounce Back*

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- **SMA membership KEEPS YOU INFORMED** of the latest industry news via *Sport Health* magazine, the *Journal of Science and Medicine in Sport* and the SMA Member e-news.

- **SMA membership PROVIDES YOU WITH NETWORKING OPPORTUNITIES** and maximises interdisciplinary referral and information exchange opportunities by being an active participant at many of the industry’s finest conferences/events.

- **SMA membership MAXIMISES YOUR EXPOSURE** through the SMA online Member Directory and other advertising opportunities.

- **SMA membership PROTECTS YOUR INTERESTS AND FUTURE** by supporting the industry’s peak multidisciplinary body. SMA lobbies government, provides representation and advice, develops policies and guidelines and actively promotes the industry in the media.

- **SMA membership SAVES YOU MONEY** by offering the Member Benefits program, discounted education opportunities and many useful resources.

To make the most of your SMA membership visit [sma.org.au](http://sma.org.au)
Lack of follow-up –
The biggest problem of our health system

Dr J explores the shortcomings and challenges associated with following up patients within our sports medicine system.

In Australia, we like to think we are home to the world’s best standard of sports medicine. We do have some objective evidence to support this proposition, like our research output in international sports medicine journals and conferences. We can also now (finally) lay claim to a recognised four year full-time medical specialty training program in sport and exercise medicine. We also like to think our sports medicine clinical management is amongst the world’s best. In this sense we have something in common with the Americans (...an arrogance that we are the world leaders in sports medicine).

It isn’t actually the only thing we have in common with them. In the field of sports medicine, both Australia and the US have a thriving fee-for-service private sector. In the US, the public sector is almost non-existent, whereas in Australia the public sector basically does not engage with the specialty of sport and exercise medicine.

“The evidence-based-medicine purists may claim that observational follow-up studies... are not all that valid for determining whether a treatment is helpful...”

“...lack of follow-up’ is an almost universal failing of all fee-for-service health systems...”

In Australia, the public system will fully treat approximately 1% of sport and exercise medicine cases on the basis that they are major trauma/emergency cases and expect that the patient will organise their own treatment for the other 99% of cases. This is one of the massive structural reforms our health system will need over the next few years. There is an enormous excess health burden (heart disease, stroke, cancer, depression, osteoporosis) due to lack of exercise, yet those who do exercise are often treated as outcasts by the public system if they are unfortunate enough to be injured while doing the right thing (i.e. exercising). If you are only injured (but not dying) you get downgraded to the end of the five hour queue in the Emergency Department and then told that your X-ray is normal and you must leave and seek treatment elsewhere (with the ‘where’ not provided by the public system). Those of us in the private sector are in some ways the beneficiaries of this neglect in that the public sector does not even attempt to provide a free sports medicine service at a baseline level to act as competition for the private sector.
“In this sense we have something in common with the Americans (...an arrogance that we are the world leaders in sports medicine).”

The poor quality of the Australian ‘public’ sports medicine system is not in any doubt, but is our private system as good as it makes out? In the majority of cases it is probably world class (in my opinion). However it is user-pays fee-for-service. If you scrape together the $3,000 you might need to get your knee fixed in the private system (which could be the bargain basement total price if uninsured but also could be the ‘gap’ amount even if insured), will it actually be money well spent? The answer is ‘maybe’ and in trying to assess whether your investment in private sports medicine care would actually be money well spent, you quickly come across the biggest weakness of our system – lack of systematic follow-up. A reason we have to explain this – but perhaps not an excuse – is that ‘lack of follow-up’ is an almost universal failing of all fee-for-service health systems not just the Australian sports medicine one.

“Those of us in the private sector are in some ways the beneficiaries of this neglect…”

The evidence-based-medicine purists may claim that observational follow-up studies (cohorts and case series) are not all that valid for determining whether a treatment is helpful, because there is a selection bias in who received treatment. In the real world, I would argue that you need a combination of Randomised Controlled Trials (RCTs) and observational studies to properly evaluate a treatment.

“...is it less ethical to enquire about success rates than to ignore them altogether (which is what happens 95% of the time in a fee-for-service system)?”

RCTs have their own problems as well, being expensive to conduct (and with bias potentially being associated with the funding body) and often only being able to study a particular type of patient or circumstance that may not be able to be generalised.

In the orthopaedic/sports medicine field, there have been RCTs over the past decade showing that knee arthroscopy for knee osteoarthritis/chondral damage fails to beat conservative care or even placebo surgery. Yet despite the dismal RCT results, there has been no suggestion of limiting funding for knee arthroscopy for osteoarthritis under Medicare (or alternate funding of treatment which may get better results). In fact the incidence of knee arthroscopy has steadily increased in Australia over the past decade despite one of the major indications being...
discredited by RCTs. Those knee surgeons who still perform arthroscopy for chondral damage and osteoarthritis will claim that the particular indications that they are operating for, on average, lead to better results than non-surgical treatment. At least they should be claiming this; otherwise they should not be performing the surgery in the first place! In trying to work out the validity of this claim, it is impractical to conduct a huge number of RCTs (e.g. RCT for chondral lesions on the lateral femoral condyle in highly active female patients under 40 with knee effusion but full range of motion). There are so many variables that a RCT taking all of them into account is impractical, yet if you don’t assess all of them, you leave the window open for surgeons to argue “in this circumstance I am convinced that knee arthroscopy is helpful, and the RCTs haven’t studied this particular circumstance”.

“...despite the dismal RCT results, there has been no suggestion of limiting funding for knee arthroscopy for osteoarthritis under Medicare...”

The practical solution is to strongly encourage (and eventually mandate?) follow-up of patients. If the real life observational follow-up results for, say, knee arthroscopy in cases of chondral damage, are equally as dismal as the RCT results, then the procedure should actually not be funded by health systems. If the observational results show circumstances where the patients are getting better results in medium-term follow up than similar patients who don’t choose surgery, then the operation probably still has some validity.

So how easy is it to achieve a reasonable follow-up of patients in the medium term? In this issue of Sport Health, an international medical student of mine presents results of a study we conducted to compare the follow-up rate of a mailout pen and paper questionnaire to using email and an internet site to complete a survey.

The procedure we chose to follow-up results for was shock wave (mainly for plantar fasciitis and calcific Achilles tendinopathy). There have been multiple RCTs showing a benefit for shock wave over placebo for these conditions, although interestingly Medicare doesn’t fund the treatment.

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We also have an open returns policy, so when you refer to The Athlete’s Foot, you know your patients are in good hands. Contact your local store for more information on how you can become part of our referral program and receive invites to education events and industry updates.
“So, in a fee-for-service system, where you get paid for performing a treatment, but it costs you lots of money to do high-end internet follow-up, how many practitioners are going to attempt the follow-up?”

The study was far more difficult to conduct than we expected. The first barrier was the ethics committee. Even though this was a non-interventional observational study protocol, the ethics committee initially had many concerns with the study. The most interesting concern was a question asked by the ethics committee – “What are you going to do for the patients who report that the treatment didn’t work for them (and that they still have pain)?” The answer, sadly, was that from the study viewpoint we weren’t trying to treat/help any specific individual – we just wanted to try to move in the direction of better patient follow-up which might lead to more appropriate treatment of all patients in the future. I can see why the ethics committee would ask this question, and in an ideal world we could address this. But is it less ethical to enquire about success rates than to ignore them altogether (which is what happens 95% of the time in a fee-for-service system)?

We finally made it through ethics (with a struggle) but came across even bigger hurdles during the study itself. In the study (which was self-funded) about $500 was spent on mailing and printing questionnaires and about $3,000 was spent on designing a web interface for the questionnaire, in addition to the many (unpaid) hours working on the project. The website was an unmitigated disaster. It took much longer than expected for the work to get completed, there were large number of bugs at many stages and then, when our initial large batch of requests to patients were sent out, someone from the web design company managed to wipe out the entry page of the site so that no one could log in for two weeks.

“The poor quality of the Australian ‘public’ sports medicine system is not in any doubt, but is our private system as good as it makes out?”

We persisted to a degree but have reported that, in our environment, a mailout pen and paper questionnaire gave far more satisfactory results than a website interface, despite more money being spent on the latter.
What is the lesson learnt from this? The technology is available to do it properly using the internet, but it was probably naive to think that for $3,000 there was enough resourcing to get the website fully functional in an ongoing sense. Google and Facebook don’t crash because there are millions spent keeping their servers alive and bug-free. So, in a fee-for-service system, where you get paid for performing a treatment, but it costs you lots of money to do high-end internet follow-up, how many practitioners are going to attempt the follow-up?

Particularly if you are on a lovely earner through our health system doing, say, knee arthroscopies for chondral damage, and you have a sneaking suspicion that maybe the RCTs are right and your lucrative procedure isn’t leading to net positive results. I have used the example of knee arthroscopy for chondral damage, but the same logic applies to less invasive procedures like cortisone injections for tennis elbow. The RCTs are reporting poor long-term results, yet there is no onus on practitioners who give these injections to do any follow-up and show that their results justify the procedure. Medicare doesn’t fund unguided injections, but will give a rebate for an ultrasound-guided injection of cortisone for tennis elbow. The majority of ultrasound-guided injections are done by radiologists, a group of specialists who often don’t offer review consultations, but are still funded for the procedure.

“It is altruistic to want to get better with follow-up, but it makes the decision easier if it also helps maintain your practice.”

There are some good examples of long-term follow-up studies in Australia that are proving to be cost effective. Leo Pinczewski has done up to 15 year follow-up studies of a large cohort of his ACL reconstructions. This has been an expensive undertaking (requiring him to finance full-time research assistants) but in the big picture he would have had a return on his investment. Leo is a very high volume knee reconstruction proceduralist, and the fact that he has multiple publications on the follow-up he has undertaken drives ongoing referrals. It is altruistic to want to get better with follow-up, but it makes the decision easier if it also helps maintain your practice. The AOA joint replacement register is also a major success story with respect to long-term follow-up. This is funded and mandated by government (as it should be, to stay independent from the device manufacturers) and in vivo it is working well when prostheses with poor results get removed from the market.

Ultimately the big ticket system reform would be that any practitioner getting substantial funding from Medicare/private health for a particular procedure would need to demonstrate adequate follow-up of results (or contribution to a register) in order to keep receiving the rebate. This would be a bit like the cost-benefit approach applied for pharmaceuticals to receive PBS listing. If my patients were drawing on Medicare rebates for shock wave (which they’re not, as it is not currently funded) and these rebates were contingent on getting adequate follow-up results, then I might be prepared to spend the many additional thousands of dollars following through on a working internet-based system for patient follow-up. At the moment, though, I have bailed out on trying to get the follow-up website working as a long term venture. Some people would suggest that I should insist on asking for money back from the website developers, for providing a product that didn’t properly do what I paid for. For the $3,000 spent on it, you would like to think that a website wouldn’t crash. But when I work and profit in a medical system where people regularly spend $3,000 on a knee operation that doesn’t work, and they aren’t entitled to their money back, it would be a bit rich for me to force the issue.

Dr J

The opinions expressed in Dr J are the personal opinions of the author.
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Injury Report 2010: Australian Football League

The AFL has conducted and published an annual injury survey every season since 199214-15, making it the longest-running sports injury surveillance system in Australia and 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 199716. Following is the 19th annual AFL Injury Report containing injury data from the 2010 season.

“The injury incidence... for 2010 was the highest... it has been in the last decade.”

Table 1 – Key indicators for all injuries over the past 10 seasons*

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<td>Incidence (recurrent)</td>
<td>5.5</td>
<td>4.4</td>
<td>4.6</td>
<td>3.7</td>
<td>4.8</td>
<td>4.1</td>
<td>5.6</td>
<td>5.4</td>
<td>3.6</td>
<td>4.7</td>
<td>4.6</td>
</tr>
<tr>
<td>Incidence (total)</td>
<td>41.3</td>
<td>38.7</td>
<td>38.7</td>
<td>38.5</td>
<td>40.1</td>
<td>38.2</td>
<td>40.3</td>
<td>42.3</td>
<td>41.4</td>
<td>43.3</td>
<td>40.3</td>
</tr>
<tr>
<td>Prevalence (missed games</td>
<td>136.4</td>
<td>134.7</td>
<td>118.7</td>
<td>131.0</td>
<td>129.2</td>
<td>138.3</td>
<td>147.1</td>
<td>147.1</td>
<td>151.2</td>
<td>153.8</td>
<td>138.8</td>
</tr>
<tr>
<td>per club per season)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Average injury severity</td>
<td>3.8</td>
<td>3.9</td>
<td>3.5</td>
<td>3.8</td>
<td>3.7</td>
<td>4.1</td>
<td>4.3</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>3.9</td>
</tr>
<tr>
<td>(number of missed games)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recurrence rate</td>
<td>15%</td>
<td>13%</td>
<td>14%</td>
<td>11%</td>
<td>14%</td>
<td>12%</td>
<td>16%</td>
<td>15%</td>
<td>10%</td>
<td>12%</td>
<td>13%</td>
</tr>
</tbody>
</table>

* For this and other tables, results are reported to a fixed number of decimal places and therefore some columns may appear to not add up correctly due to rounding.

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 2010 was the highest (38.6 new injuries per team per season) it has been in the last decade. 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 (4.7 per team per season or 12%) was close to the long-term average.

Injury incidence

Table 2 (overleaf) details the incidence of the major injury categories. Notable findings to report for injury incidence in 2010 include a higher than usual incidence of groin strains/ostitis pubis and ankle sprains. However, the vast majority of injury categories exhibited incidence close to or slightly above the long-term (10 year) average.
### Table 2 – Injury incidence (new injuries per club per season)

<table>
<thead>
<tr>
<th>Body area</th>
<th>Injury type</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>10 year average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head/neck</td>
<td>Concussion</td>
<td>0.7</td>
<td>0.7</td>
<td>0.3</td>
<td>0.3</td>
<td>0.7</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Facial fractures</td>
<td>0.4</td>
<td>0.4</td>
<td>0.6</td>
<td>0.8</td>
<td>0.6</td>
<td>0.3</td>
<td>0.4</td>
<td>0.2</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Neck sprains</td>
<td>0.1</td>
<td>0.0</td>
<td>0.0</td>
<td>0.1</td>
<td>0.2</td>
<td>0.3</td>
<td>0.1</td>
<td>0.2</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td></td>
<td>Other head/neck injuries</td>
<td>0.3</td>
<td>0.2</td>
<td>0.3</td>
<td>0.2</td>
<td>0.1</td>
<td>0.2</td>
<td>0.2</td>
<td>0.1</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Shoulder/arm/elbow</td>
<td>Shoulder sprains and dislocations</td>
<td>1.1</td>
<td>0.9</td>
<td>1.3</td>
<td>1.0</td>
<td>1.4</td>
<td>1.6</td>
<td>1.0</td>
<td>1.8</td>
<td>1.3</td>
<td>1.6</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>A/C joint injuries</td>
<td>0.9</td>
<td>1.1</td>
<td>0.3</td>
<td>1.1</td>
<td>0.8</td>
<td>1.2</td>
<td>0.8</td>
<td>0.7</td>
<td>0.5</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>Fractured clavicles</td>
<td>0.3</td>
<td>0.3</td>
<td>0.2</td>
<td>0.6</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.1</td>
<td>0.2</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td>Elbow sprains or joint injuries</td>
<td>0.2</td>
<td>0.1</td>
<td>0.1</td>
<td>0.3</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>Other shoulder/arm/elbow injuries</td>
<td>0.5</td>
<td>0.8</td>
<td>0.5</td>
<td>0.4</td>
<td>0.6</td>
<td>0.3</td>
<td>0.2</td>
<td>0.3</td>
<td>0.1</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>Forearm/wrist/hand</td>
<td>Forearm/wrist/hand fractures</td>
<td>0.8</td>
<td>1.1</td>
<td>0.8</td>
<td>1.1</td>
<td>1.3</td>
<td>1.1</td>
<td>0.9</td>
<td>1.2</td>
<td>1.1</td>
<td>1.2</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Other hand/wrist/forearm injuries</td>
<td>0.3</td>
<td>0.4</td>
<td>0.7</td>
<td>0.4</td>
<td>0.3</td>
<td>0.6</td>
<td>0.4</td>
<td>0.4</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>Trunk/back</td>
<td>Rib and chest wall injuries</td>
<td>0.4</td>
<td>0.9</td>
<td>0.8</td>
<td>0.7</td>
<td>0.4</td>
<td>1.0</td>
<td>0.4</td>
<td>0.7</td>
<td>0.3</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>Lumber and thoracic spine injuries</td>
<td>1.4</td>
<td>0.9</td>
<td>0.8</td>
<td>1.6</td>
<td>2.1</td>
<td>1.5</td>
<td>1.3</td>
<td>1.5</td>
<td>1.4</td>
<td>1.7</td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>Other buttck/back/trunk injuries</td>
<td>0.5</td>
<td>0.4</td>
<td>0.5</td>
<td>0.6</td>
<td>0.4</td>
<td>0.6</td>
<td>0.5</td>
<td>0.7</td>
<td>0.5</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Hip/groin/thigh</td>
<td>Groin strains/osteitis pubis</td>
<td>3.5</td>
<td>3.8</td>
<td>2.9</td>
<td>3.1</td>
<td>2.9</td>
<td>3.3</td>
<td>4.1</td>
<td>3.2</td>
<td>3.3</td>
<td>4.1</td>
<td>3.4</td>
</tr>
<tr>
<td></td>
<td>Hamstring strains</td>
<td>6.0</td>
<td>4.4</td>
<td>5.7</td>
<td>6.3</td>
<td>5.2</td>
<td>6.4</td>
<td>6.7</td>
<td>6.6</td>
<td>7.1</td>
<td>6.0</td>
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<tr>
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<td>Quadriceps strains</td>
<td>1.6</td>
<td>1.7</td>
<td>2.0</td>
<td>1.9</td>
<td>1.9</td>
<td>1.7</td>
<td>1.8</td>
<td>2.1</td>
<td>1.7</td>
<td>1.8</td>
<td>1.7</td>
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<tr>
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<td>Thigh and hip haematomas</td>
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<td>1.0</td>
<td>1.1</td>
<td>0.6</td>
<td>0.5</td>
<td>1.0</td>
<td>1.1</td>
<td>0.8</td>
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<tr>
<td></td>
<td>Other hip/groin/thigh injuries, including hip joint</td>
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<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
<td>0.2</td>
<td>0.3</td>
<td>0.8</td>
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<td>1.0</td>
<td>0.7</td>
<td>0.5</td>
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<tr>
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<td>Knee ACL</td>
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<td>0.8</td>
<td>0.6</td>
<td>0.5</td>
<td>0.6</td>
<td>0.9</td>
<td>0.6</td>
<td>0.9</td>
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<td>0.6</td>
<td>0.7</td>
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<tr>
<td></td>
<td>Knee MCL</td>
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<td>0.9</td>
<td>1.0</td>
<td>0.7</td>
<td>1.0</td>
<td>0.8</td>
<td>1.4</td>
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<td>0.4</td>
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<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>Knee cartilage</td>
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<td>1.3</td>
<td>1.7</td>
<td>1.2</td>
<td>1.3</td>
<td>1.0</td>
<td>1.2</td>
<td>1.6</td>
<td>2.0</td>
<td>1.7</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Patella injuries</td>
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<td>0.4</td>
<td>0.1</td>
<td>0.1</td>
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<td>0.2</td>
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<tr>
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<td>Knee tendon injuries</td>
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<td>0.8</td>
<td>0.7</td>
<td>0.4</td>
<td>0.7</td>
<td>0.4</td>
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<td>0.5</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Other knee injuries</td>
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<td>0.5</td>
<td>0.7</td>
<td>0.7</td>
<td>0.9</td>
<td>0.2</td>
<td>0.8</td>
<td>1.0</td>
<td>1.0</td>
<td>0.4</td>
<td>0.7</td>
</tr>
<tr>
<td>Shin/ankle/foot</td>
<td>Ankle joint sprains, including syndesmosis sprains</td>
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<td>2.5</td>
<td>2.6</td>
<td>2.5</td>
<td>2.5</td>
<td>2.1</td>
<td>2.2</td>
<td>2.5</td>
<td>2.6</td>
<td>3.3</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>Calf strains</td>
<td>1.6</td>
<td>2.2</td>
<td>1.6</td>
<td>0.9</td>
<td>1.9</td>
<td>1.6</td>
<td>1.2</td>
<td>2.0</td>
<td>1.3</td>
<td>1.7</td>
<td>1.6</td>
</tr>
<tr>
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<td>Achilles tendon injuries</td>
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<td>0.6</td>
<td>0.4</td>
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</tr>
<tr>
<td></td>
<td>Leg and foot fractures</td>
<td>1.0</td>
<td>0.8</td>
<td>0.5</td>
<td>0.5</td>
<td>0.4</td>
<td>0.7</td>
<td>0.5</td>
<td>0.5</td>
<td>1.0</td>
<td>0.9</td>
<td>0.7</td>
</tr>
<tr>
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<td>Leg and foot stress fractures</td>
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<td>0.7</td>
<td>0.9</td>
<td>0.9</td>
<td>0.9</td>
<td>1.1</td>
<td>1.1</td>
<td>0.9</td>
<td>0.9</td>
<td>1.2</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>Other leg/foot/ankle injuries</td>
<td>1.7</td>
<td>0.8</td>
<td>1.5</td>
<td>1.7</td>
<td>1.3</td>
<td>1.5</td>
<td>1.3</td>
<td>1.1</td>
<td>1.5</td>
<td>1.7</td>
<td>1.4</td>
</tr>
<tr>
<td>Medical</td>
<td>Medical illnesses</td>
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<td>2.3</td>
<td>2.4</td>
<td>2.0</td>
<td>2.2</td>
<td>0.7</td>
<td>1.9</td>
<td>2.1</td>
<td>2.9</td>
<td>2.1</td>
<td>2.0</td>
</tr>
<tr>
<td>Non-football injuries, including pre-existing</td>
<td>0.2</td>
<td>0.3</td>
<td>0.4</td>
<td>0.1</td>
<td>0.1</td>
<td>0.2</td>
<td>0.2</td>
<td>0.3</td>
<td>0.2</td>
<td>0.5</td>
<td>0.2</td>
<td></td>
</tr>
</tbody>
</table>

| **NEW INJURIES/CLUB/SEASON** | 35.8 | 34.4 | 34.1 | 34.8 | 35.3 | 34.0 | 34.7 | 36.9 | 37.8 | **38.6** | 35.6 |
Injury recurrence

Table 3 and Figure 1 show the rate of recurrence of some of the common injury types which are prone to 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 rate. 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>
<thead>
<tr>
<th>Recurrence rates</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>10 year average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamstring strains</td>
<td>25%</td>
<td>30%</td>
<td>27%</td>
<td>22%</td>
<td>26%</td>
<td>16%</td>
<td>22%</td>
<td>27%</td>
<td>18%</td>
<td>14%</td>
<td>23%</td>
</tr>
<tr>
<td>Groin strains and osteitis pubis</td>
<td>20%</td>
<td>23%</td>
<td>20%</td>
<td>24%</td>
<td>23%</td>
<td>28%</td>
<td>38%</td>
<td>23%</td>
<td>19%</td>
<td>20%</td>
<td>24%</td>
</tr>
<tr>
<td>Ankle sprains or joint injuries</td>
<td>17%</td>
<td>16%</td>
<td>6%</td>
<td>11%</td>
<td>15%</td>
<td>10%</td>
<td>20%</td>
<td>9%</td>
<td>10%</td>
<td>5%</td>
<td>12%</td>
</tr>
<tr>
<td>Quadriceps strains</td>
<td>10%</td>
<td>17%</td>
<td>9%</td>
<td>6%</td>
<td>20%</td>
<td>19%</td>
<td>18%</td>
<td>15%</td>
<td>15%</td>
<td>18%</td>
<td>15%</td>
</tr>
<tr>
<td>Calf strains</td>
<td>17%</td>
<td>13%</td>
<td>14%</td>
<td>6%</td>
<td>12%</td>
<td>7%</td>
<td>9%</td>
<td>5%</td>
<td>0%</td>
<td>12%</td>
<td>9%</td>
</tr>
<tr>
<td>All injuries</td>
<td>15%</td>
<td>13%</td>
<td>14%</td>
<td>11%</td>
<td>14%</td>
<td>12%</td>
<td>16%</td>
<td>15%</td>
<td>10%</td>
<td>12%</td>
<td>13%</td>
</tr>
</tbody>
</table>

Weekly player status and injury prevalence

Table 4 (overleaf) 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 2010 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, etc.).

Figure 1 – Recurrence rates (recurrent injuries as a percentage of new injuries)
### Table 4 – Average weekly player status by season

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
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<td>Playing AFL</td>
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<td>22.0</td>
<td>22.0</td>
<td>22.0</td>
<td>22.0</td>
<td>22.0</td>
<td>22.0</td>
<td>22.0</td>
<td>22.0</td>
<td>22.0</td>
<td>22.0</td>
<td>22.0</td>
<td>22.0</td>
<td>22.0</td>
</tr>
<tr>
<td>Playing lower grade</td>
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<td>11.4</td>
<td>11.4</td>
<td>11.3</td>
<td>12.9</td>
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### Table 5 – Injury prevalence (missed games per club per season)

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Hamstring injuries

Hamstring injuries are the most common injury in the AFL and are responsible for the highest number of matches missed through injury. 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). Previous analysis of hamstring and other muscle strain data shows a high rate of recurrence. The current AFL data shows that management of these injuries has become more conservative over the past decade in the AFL, with recurrence tending to decrease but prevalence and severity tending to increase. This change in management strategy has possibly been led by research showing that recurrence rates remain high for many weeks after the initial injury and that performance of players is often decreased in the matches soon after return from hamstring strain. Hamstring injuries are known to affect older players and those with a past history of injury more often than other players.

Table 6 – Key indicators for hamstring strains over the past decade

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<th>Hamstring injuries</th>
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<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
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<th>2008</th>
<th>2009</th>
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<td>22%</td>
<td>26%</td>
<td>16%</td>
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<td>27%</td>
<td>18%</td>
<td>14%</td>
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</table>
Shoulder injuries

Table 7 shows a slight but steady increase in the rates of shoulder injuries over the past decade. In 2010, shoulder injury recurrence rates were the highest they have been on the ten-year record. 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 facilitated through increased use of the interchange, combined with the subsequent increase in collisions and high intensity collisions may also be a contributing factor.

A research project is currently underway examining 1) the evolution of tackling in the modern game; 2) the potential impact this might be having on rates of shoulder injury; and 3) outcomes from past shoulder injury management including surgical outcomes.

In addition to the above, the other factor possibly contributing to the increasing trend in shoulder injuries is the greater tendency for teams to end a player’s season somewhat earlier with shoulder reconstruction which is impacting on the observed rates of shoulder injury.

“In 2010, shoulder injury recurrence rates were the highest they have been on the ten-year record.”

Table 7 – Key indicators for shoulder injuries over the past decade

<table>
<thead>
<tr>
<th>Shoulder sprains and dislocations</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>10 year average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence</td>
<td>1.1</td>
<td>0.9</td>
<td>1.3</td>
<td>1.0</td>
<td>1.4</td>
<td>1.6</td>
<td>1.0</td>
<td>1.8</td>
<td>1.3</td>
<td>1.6</td>
<td>1.3</td>
</tr>
<tr>
<td>Prevalence</td>
<td>5.4</td>
<td>5.9</td>
<td>5.7</td>
<td>5.9</td>
<td>7.7</td>
<td>10.8</td>
<td>6.4</td>
<td>10.2</td>
<td>7.7</td>
<td>10.9</td>
<td>7.7</td>
</tr>
<tr>
<td>Severity</td>
<td>4.9</td>
<td>6.7</td>
<td>4.4</td>
<td>5.9</td>
<td>5.6</td>
<td>6.7</td>
<td>6.3</td>
<td>5.8</td>
<td>5.7</td>
<td>6.9</td>
<td>5.9</td>
</tr>
<tr>
<td>Recurrence rate</td>
<td>10%</td>
<td>13%</td>
<td>9%</td>
<td>11%</td>
<td>20%</td>
<td>13%</td>
<td>16%</td>
<td>9%</td>
<td>12%</td>
<td>26%</td>
<td>14%</td>
</tr>
</tbody>
</table>
Knee ligament injuries

“There have been lower rates of PCL injuries since the introduction of the centre circle rule in season 2005, including zero centre bounce PCL injuries in 2010.”

The two major knee ligament injuries, anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL), have shown slightly decreased injury rates in recent years (Table 8). There have been lower rates of PCL injuries since the introduction of the centre circle rule in season 2005, including zero centre bounce PCL injuries in 2010. There has certainly been a long-term decline in the risk of PCL injuries in ruckmen in the AFL33.

“The use of LARS artificial grafts has contributed to the quicker return to play of some ACL injuries and lower prevalence.”

Knee ACL injury incidence has been generally steady over the past few seasons (Table 8) although there was a lower reported prevalence in 2010. Not all ACL injuries in 2010 missed the remainder of the season, which is usually the case. Some (partial) ACL injuries were treated non-surgically and resulted in less missed time as a result. It is still too early to determine whether these grafts will have a good success rate in the longer term, but for circumstances where a quick return is paramount (e.g. older players), then LARS grafts appear to offer an alternative management which allows quicker return to play. Further surveillance and research is required before they can be recommended as a long-term alternative for younger players.

Table 8 – Key indicators for major knee ligament injuries over the past decade

<table>
<thead>
<tr>
<th>Knee ligament injuries</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>10 year average</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCL incidence</td>
<td>1.0</td>
<td>0.4</td>
<td>0.5</td>
<td>0.7</td>
<td>0.4</td>
<td>0.3</td>
<td>0.2</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>PCL prevalence</td>
<td>5.9</td>
<td>2.3</td>
<td>2.0</td>
<td>6.5</td>
<td>2.7</td>
<td>1.8</td>
<td>1.6</td>
<td>2.2</td>
<td>1.2</td>
<td>3.2</td>
<td>2.9</td>
</tr>
<tr>
<td>Number of PCL injuries (total)</td>
<td>18</td>
<td>8</td>
<td>13</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>8.0</td>
<td></td>
</tr>
<tr>
<td>Number of centre bounce PCL injuries</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>ACL incidence</td>
<td>0.9</td>
<td>0.8</td>
<td>0.6</td>
<td>0.5</td>
<td>0.6</td>
<td>0.9</td>
<td>0.6</td>
<td>0.9</td>
<td>0.7</td>
<td>0.6</td>
<td>0.7</td>
</tr>
<tr>
<td>ACL prevalence</td>
<td>13.6</td>
<td>15.3</td>
<td>10.8</td>
<td>10.1</td>
<td>9.3</td>
<td>14.1</td>
<td>15.1</td>
<td>15.3</td>
<td>11.1</td>
<td>7.8</td>
<td>12.3</td>
</tr>
<tr>
<td>Number of ACL reconstructions using autografts</td>
<td>17</td>
<td>15</td>
<td>11</td>
<td>9</td>
<td>10</td>
<td>19</td>
<td>13</td>
<td>15</td>
<td>13</td>
<td>5</td>
<td>12.7</td>
</tr>
<tr>
<td>Pre-existing ACL injuries/non-AFL injuries</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0.6</td>
</tr>
<tr>
<td>Number of graft ruptures</td>
<td>1</td>
<td>4</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>1.9</td>
</tr>
<tr>
<td>Number of LARS reconstructions</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0.6</td>
</tr>
<tr>
<td>Partial ACL injuries</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>0.4</td>
</tr>
</tbody>
</table>
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Concussion

“The rates of concussion in the past decade are lower than those reported in the 1990s.”

Table 9 shows consistently low incidence and prevalence for concussion (consistently fewer than one injury per team per season which causes a game to be missed). The rates of concussion in the past decade are lower than those reported in the 1990s. The AFL’s stance on 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 the low rates of concussion. Further tightening of these rules occurred prior to the 2011 season.

The AFL Injury Report definition of concussion is the one definition most frequently challenged in the context of only capturing those concussions which cause a week to be missed. Any change to the definition of concussion for the survey would compromise the ability to detect long-term trends based on the historical data. There are reports from other codes of football where retired players concede that on some occasions when they received concussions they did not report the full extent of symptoms to team medical staff. For this reason, trying to achieve a record of ‘all’ concussions for all teams would be very difficult. A separate study is being undertaken to monitor concussion in greater detail this year.

There is increasing concern about the potential cumulative impact of so-called ‘minor’ concussions, particularly in the sport of American Football. However, return to play strategies in the AFL (including the majority of players not missing a game) have been validated as in line with best practice, included in the American Journal of Sports Medicine. The AFL Medical Officers Association introduced new concussion guidelines at the beginning of the 2011 Season. These guidelines promote a more conservative approach to managing concussion whereby a player diagnosed with concussion cannot return to the field.

In addition to the new concussion guidelines, there are two detailed research projects underway investigating a) the use of advanced neuroimaging techniques to help identify factors associated with more severe injuries and higher risks of complications; and 2) tracking the longer term outcomes in current and former AFL players who have sustained concussions.

Groin injuries

“Groin injuries... have a high rate of recurrence and a high rate of becoming chronic.”

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.

Table 9 – Key indicators for concussion over the past decade

<table>
<thead>
<tr>
<th>Concussion</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>10 year average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence</td>
<td>0.7</td>
<td>0.7</td>
<td>0.3</td>
<td>0.3</td>
<td>0.7</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Prevalence</td>
<td>1.3</td>
<td>2.0</td>
<td>0.6</td>
<td>0.3</td>
<td>0.9</td>
<td>0.3</td>
<td>0.3</td>
<td>0.5</td>
<td>0.7</td>
<td>0.8</td>
<td>0.8</td>
</tr>
</tbody>
</table>
Relationship between increasing interchange use and injuries

“AFL overall injury incidence and prevalence have slightly but significantly increased over the last seven years.”

AFL overall injury incidence and prevalence have slightly but significantly increased over the last seven years. Over this same time period interchange use by AFL teams has substantially increased. There appears to be an association between these factors however the relationship is complicated. An analysis carried out in 2010 further explored the relationship between injuries and interchange. A statistically significant relationship was demonstrated between risk of injury and interchange using a logistic regression model (Table 11) as detailed overleaf.

Table 10 – Key indicators for groin injuries over the past decade

<table>
<thead>
<tr>
<th>Groin injuries</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>10 year average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence</td>
<td>3.5</td>
<td>3.8</td>
<td>2.9</td>
<td>3.1</td>
<td>2.9</td>
<td>3.3</td>
<td>4.1</td>
<td>3.2</td>
<td>3.3</td>
<td>4.1</td>
<td>3.4</td>
</tr>
<tr>
<td>Prevalence</td>
<td>13.6</td>
<td>15.7</td>
<td>13.7</td>
<td>13.3</td>
<td>11.2</td>
<td>14.0</td>
<td>18.0</td>
<td>12.4</td>
<td>11.7</td>
<td>15.3</td>
<td>13.8</td>
</tr>
<tr>
<td>Severity</td>
<td>3.9</td>
<td>4.1</td>
<td>4.8</td>
<td>4.4</td>
<td>3.9</td>
<td>4.3</td>
<td>4.4</td>
<td>3.9</td>
<td>3.5</td>
<td>3.7</td>
<td>4.1</td>
</tr>
<tr>
<td>Recurrence rate</td>
<td>20%</td>
<td>23%</td>
<td>20%</td>
<td>24%</td>
<td>23%</td>
<td>28%</td>
<td>38%</td>
<td>23%</td>
<td>19%</td>
<td>20%</td>
<td>24%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other hip</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>10 year average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
<td>0.3</td>
<td>0.2</td>
<td>0.3</td>
<td>0.8</td>
<td>0.8</td>
<td>1.0</td>
<td>0.7</td>
<td>0.5</td>
</tr>
<tr>
<td>Prevalence</td>
<td>1.7</td>
<td>1.2</td>
<td>1.5</td>
<td>2.6</td>
<td>1.0</td>
<td>2.3</td>
<td>4.5</td>
<td>3.4</td>
<td>6.9</td>
<td>4.7</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Each interchange made by the opposition increases a team’s risk of injury by approximately 0.8% (statistically significant relationship, P=0.005, 95% confidence intervals 0.3% to 1.4%) (Figure 3 overleaf). Each interchange made by the team itself (in the previous week) decreases their risk of injury by 0.4% (strong trend, P=0.13, 95% confidence intervals +0.1% to -1.0%). This logistic regression model did not find game continuity (as measured by length of the game/percentage of time in play) to be a significant predictor of injury, suggesting that the increases in injury rates in recent years were related to interchange use rather than changes in game continuity.

Although this described link does not fully explain the underlying mechanisms, a simple paradigm which is consistent would be that a player who has just come onto the ground having been interchanged is temporarily less likely to get injured (because he is rested) but his direct opponent is temporarily more likely to get injured (as he is a fatigued player competing against, and trying to run with, a rested player).
There are further consequences of this complex relationship, apart from the increase in injuries for the competition as a whole. There is now a strong incentive for clubs to continue to increase their interchange movements in an ‘arms race’, because they have perceived (correctly) that there are advantages to making more interchanges than the opposition. This advantage extends to a lower rate of injuries relative to the opposition (Figure 4).

There is also an increased consequence to a team of an injury occurring during a game. Not only does the injury decrease a team’s chance of winning that match, but it also restricts the number of interchange rotations that can be made, furthering the likelihood of other injuries.

In addition to the above research, a number of other studies were undertaken to address questions that had been raised throughout the Laws of the Game consultation. Four independent reviews of the methodology used in the research were also commissioned. Both the further research and the reviews fortified the initial concerns.

“...if unchecked interchange would take player speed and congestion to a new level...”

Although direct cause and effect could not be proven, the evidence available suggested that if left unchecked interchange would take player speed and congestion to a new level and there remained concern about potential further increases in collision injuries.

After extensive consultation over a four-year period and throughout 2010 involving clubs, coaches, players, club medical officers, physiotherapists and fitness staff, the AFL announced that the interchange would be reduced from four to three players, and that a substitute player would be introduced for the 2011 Season.
Figure 3 – Risk that there will be an injury for each AFL team squad each week (22 players) based on opposition team number of interchanges made in the match (2003–10 data for home and away season rounds 1–21)*

* Round 22 not included as it is less likely that a player will miss a match because some teams end their season.

Figure 4 – Risk that there will be an injury for each AFL team squad each week (22 players) based on differential number of interchanges made between own team (previous week) and opposition (current week) (seasons 2003–10, rounds 2–21)

* The previous week is used for own team interchange count because of the confounder that a low number of interchanges is itself a marker of an injury having occurred. Round 1 is also excluded (compared to dataset in Figure 3) as there is no previous week’s match to include.

Table 11 – Logistic regression model for AFL team risk of suffering at least one injury (i.e. player misses the following week) from a game (seasons 2003–10, rounds 2–21)*

<table>
<thead>
<tr>
<th>Effect of each interchange made by the opposition</th>
<th>B</th>
<th>S.E.</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>95.0% C.I. for EXP(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.008</td>
<td>.003</td>
<td>.005</td>
<td>1.008</td>
<td>1.003 1.003 1.014</td>
</tr>
<tr>
<td>Effect of each interchange made by the team in the previous week</td>
<td>-.004</td>
<td>.003</td>
<td>.133</td>
<td>.996</td>
<td>.990 1.001</td>
</tr>
<tr>
<td>Constant</td>
<td>.181</td>
<td>.088</td>
<td>.039</td>
<td>1.198</td>
<td></td>
</tr>
</tbody>
</table>

* The previous week is used for own team interchange count because of the confounder that a low number of interchanges is itself a marker of an injury having occurred. Round 1 is also excluded (compared to dataset in Figure 3) as there is no previous week’s match to include.
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Snapshot

- Overall a higher injury incidence and prevalence in season 2010 compared with season 2009, which is a continuation of a consistent but gradual upwards trend in both injury incidence and prevalence since 2003.
- 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.
- The number one injury in the game remains the hamstring strain. Incidence and prevalence rates of this injury remain high. The 2010 figures were slightly down from 2009 but were consistent with the long-term averages. A recurrence rate of 14% for hamstring strains in 2010 was the lowest rate recorded.
- Rates of concussion have been low and steady over the past decade. The AFL Medical Officers Association introduced new guidelines for the management of concussion at the beginning of the 2011 Season. The guidelines promote a conservative approach to managing concussion whereby a player diagnosed with concussion cannot return to the field.
- The most severe of the common injuries is still the knee anterior cruciate ligament (ACL) tear, with slightly lower rates in season 2010 compared with recent seasons. In particular, prevalence (missed time) for ACL injuries was down in 2010.
- Other studies related to the injury survey have reported that interchange use, player speed and tackling have increased similarly to injuries in recent seasons. Research undertaken in 2010 demonstrated that each interchange is beneficial (from an injury risk viewpoint) for the team that makes it, but is harmful for the opposition team.
- The trend in centre bounce PCL injuries has continued to remain at record low levels following the introduction of the ruck rule in 2005. In 2010 there were zero PCL injuries from centre bounces and there have been only four in total since 2005.

Acknowledgements

The authors and AFL Medical Officers would like to acknowledge the following people who contributed to the survey in 2010: David Binney, Dr Andrew Potier (Medical Services Coordinator and Doctor, Adelaide), Paul McConnan, Lachlan Penfold (Doctor and Sports Scientist, Brisbane), Dr Ben Barresi (Doctor, Carlton), Gary Nicholls (Physiotherapist, Collingwood), Bruce Connor (Physiotherapist, Essendon), Jeff Boyle and Norm Tame (Physiotherapist and Football Staff, Fremantle), Dr Chris Bradshaw (Doctor, Geelong), Drs Peter Barrie and Michael Makdissi (Doctors, Hawthorn), Dr Andrew Daff (Doctor, Melbourne), Dr Con Mitropoulos (Doctor, Kangaroos), Dr Mark Fisher and Michael Heynan (Doctor and Physiotherapist, Port Adelaide), Dr Greg Hickey (Doctor, Richmond), Dr Tim Barbour and Andrew Walls (Doctor and Physiotherapist, St Kilda), Dr Nathan Gibbs (Doctor, Sydney), Paul Tucker (Physiotherapist, West Coast Eagles), Dr Gary Zimmerman, Andrew McKenzie (Doctor, Western Bulldogs), Dr Peter Harcourt and Dr Harry Unglik (AFL Medical Commissioners), Shane McCurry, Rod Austin, Adrian Anderson and Peta Edebone (AFL Administration), Touraj Vizari (Athletic Logic), Greg Planner (Champion Data), Jessica Orchard and 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, AFL Medical Officers Association


References, as indicated within the article, are available at sma.org.au/publications/sport-health/
Paper vs internet for follow up

Vox pop

SMA took to the streets to ask members their opinions on the following question:

What do you see as SMA’s role in the sports medicine industry?

“SMA is an important umbrella organisation, important in research and education for all those involved in sports medicine.”
Professor George Murrell, Department of Orthopaedic Surgery, St George Hospital, NSW

“I see SMA as an umbrella organisation that encourages cross-disciplinary interactions (e.g., between physios, psychologists, sport scientists, podiatrists, nutritionists, and medicos). With the multidisciplinary involvement and support, SMA also represents greater numbers than any single subdiscipline could manage on its own, thereby increasing the strength of members’ voices in the political arena.”

Stephanie J. Hanrahan, Sport and Exercise Psychologist, The University of Queensland, QLD

Victor van den Berg and sports physician Dr John Orchard compare the methods of paper mail out and internet for clinical follow-up of sports medicine patients.

A patient survey is one way to assess the success rate for medical procedures. There are various methods for trying to achieve high follow-up rates, but there is no consensus that one particular method is universally superior to others. Since more and more people are using the internet, the usefulness of this as a survey method needs to be further investigated. Using the internet for data collection has some obvious advantages, i.e. can potentially be cheaper (particularly when the number of participants is high), can give faster results, collected data can be transferred directly to a statistical program, and the questionnaire can easily be adjusted if needed. However one of the most important features of any mode of data collecting is the response rate and those of the internet have not yet shown to be superior to those of the traditional paper questionnaire.

“The assumption that people get more and more comfortable with the use of the internet...seems to be wrong.”
Study results comparing web and paper surveys published from 1995 to 2005, showed an overall response rate for web surveys of 34% compared to a 45% response for paper surveys. These studies were observing the response rates in various settings and populations with different research goals (not all medical). The analysis also found some other interesting statistics. The assumption that people get more and more comfortable with the use of the internet, which would possibly lead to an increase over time of web survey responses, seems to be wrong. The publication year did not significantly influence the difference in response rate between web and paper survey. Further, the researchers found that a follow-up reminder is significantly more effective for mail surveys. Comparative studies without reminders found a difference in response rate of 4% in favour of mail surveys. In studies that did use follow-up reminders this difference was 14%.

Because neither internet nor paper surveys alone obtains very impressive response rates, it is common to use mixed-mode designs for surveys. Mixed modes are used to increase the response rate and to reduce an over or under representation of a certain group in society, i.e. the various modes compensate for each other’s weaknesses. For example, it has been found that the college population is more likely to respond to an internet survey instead of a paper one while the rest of the population is more likely to respond to a paper questionnaire.

“We hypothesized that an internet survey in a sports medicine clinic population would have a higher response rate than a traditional paper questionnaire.”

By giving the interviewee a choice in how they will answer, it is more likely that their favourite mode is available and thus they will answer and thereby more valid results will be obtained. A comparative study mixing letter questionnaires and web questionnaires among physicians evaluating the Electronic Medical Record found the overall response rate grew from 57.4% to 70.5% for the mail/web combination and from 46.9% to 62.9% for the web/mail combination.

Despite the fact that internet surveys have yet to be proven to generate higher response rates, using the web does have advantages (some of which have been stated previously). Further to these, patients attending sports medicine clinics may differ from the normal population. They are perhaps more likely to be younger and professionals or students. Since sports medicine clinics in Australia are private, out of pocket costs bias the population of patients to upper socioeconomic groups. We hypothesized that an internet survey in a sports medicine clinic population would have a higher response rate than a traditional paper questionnaire.
The study
We aimed to compare the success rate (particularly in terms of response rate) of a paper questionnaire to a web-based questionnaire. Study patients were those who had received ESWT (Extracorporeal Shock Wave Treatment) at South Sydney Sports Medicine clinic for a sports medicine condition. The majority of patients had been treated for calcific insertional Achilles tendinopathy or plantar fasciitis (treated by author John Orchard).

There were two groups of patients. One group was recruited prospectively to receive either an email or mailout (or both) asking them to report on their progress. A pilot trial on a group of historical patients was also started. Only the mail address details were known for these patients so they were sent a paper questionnaire with the offer that they could answer it and return it in a pre-paid envelope or answer it online at a website. The questionnaire designed for this research contained six questions about injury and what effect the patient felt the treatment had on that injury. The estimated time for completing the questionnaire was less than five minutes. The paper questionnaire was mailed out to the last known address of the patients, along with a participant information statement and a pre-paid envelope. A professional web design company was engaged to design a web page for data entry, with a question format identical to the paper questionnaire, along with an ID and password entry. All patients had four weeks to respond.

“...paper-based administration was far more successful than the web-based administration.”

The results
The paper-based administration was far more successful than the web-based administration. In total only 3 surveys were completed through the website versus 87 completed surveys received by mail. Table 1 shows a breakdown of the response rates. When solely looking at the method of response for those who did respond, paper-based responses comprised 96.7% of surveys received, compared to 3.3% for the internet-based administration.

Table 1 – Summary of response rates

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Responses</th>
<th></th>
<th></th>
<th></th>
<th>Response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td></td>
<td>Internet</td>
<td>Mail</td>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First pilot</td>
<td>212</td>
<td>2</td>
<td>67</td>
<td>69</td>
<td></td>
<td>32.6%</td>
</tr>
<tr>
<td>Second pilot</td>
<td>50</td>
<td>0</td>
<td>11</td>
<td>11</td>
<td></td>
<td>22.0%</td>
</tr>
<tr>
<td>Prospective mixed mode study</td>
<td>22</td>
<td>1</td>
<td>9</td>
<td>10</td>
<td></td>
<td>45.5%</td>
</tr>
<tr>
<td>Total</td>
<td>284</td>
<td>3</td>
<td>87</td>
<td>90</td>
<td></td>
<td>31.7%</td>
</tr>
</tbody>
</table>
In order to assess if there was a non-response bias, we compared age, gender, injury and the year of treatment of the respondents to those characteristics of the total study group. The results are presented in Table 2. No bias was found for gender or type of injury but there was a significant difference in age. The respondents were on average older than the total group with a significant difference if the group of cases ‘40 and younger’ is compared with the group of cases ‘40 and older’.

Even though it was not the primary objective for this study to assess the success rate of the ESWT, the results are presented in Table 3 (overleaf). There was no significant difference in success rates for the different injuries. Almost 40% of the respondents claimed that the ESWT definitely made them better or even cured them. Overall about 23% would definitely not do the treatment again if they had the same condition. There was only one claim of being worse off as an effect of the treatment.

### Table 2 – Comparison of response rates

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall distribution</th>
<th>Excluding non delivered</th>
<th>Responses through mail</th>
<th>Responses through internet</th>
<th>Total responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=290</td>
<td>n=284</td>
<td>n=87</td>
<td>n=3</td>
<td>n=90</td>
</tr>
<tr>
<td>Age (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;=30</td>
<td>15 (5.2%)</td>
<td>15 (5.3%)</td>
<td>1 (1.1%)</td>
<td>1 (1.1%)</td>
<td>1 (1.1%)</td>
</tr>
<tr>
<td>31–40</td>
<td>32 (11.0%)</td>
<td>32 (11.3%)</td>
<td>4 (4.6%)</td>
<td>1 (33.3%)</td>
<td>5 (5.6%)</td>
</tr>
<tr>
<td>41–50</td>
<td>67 (23.1%)</td>
<td>66 (23.2%)</td>
<td>22 (25.3%)</td>
<td>2 (66.7%)</td>
<td>22 (24.4%)</td>
</tr>
<tr>
<td>51–60</td>
<td>84 (29.0%)</td>
<td>81 (28.5%)</td>
<td>26 (29.9%)</td>
<td>2 (66.7%)</td>
<td>28 (31.1%)</td>
</tr>
<tr>
<td>61–70</td>
<td>67 (23.1%)</td>
<td>66 (23.2%)</td>
<td>24 (27.6%)</td>
<td></td>
<td>24 (26.7%)</td>
</tr>
<tr>
<td>70+</td>
<td>25 (8.6%)</td>
<td>24 (8.5%)</td>
<td>10 (11.5%)</td>
<td></td>
<td>10 (11.1%)</td>
</tr>
<tr>
<td>Gender (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>152 (52.4%)</td>
<td>149 (52.5%)</td>
<td>45 (51.7%)</td>
<td>2 (66.7%)</td>
<td>47 (52.2%)</td>
</tr>
<tr>
<td>Male</td>
<td>138 (47.6%)</td>
<td>135 (47.5%)</td>
<td>42 (48.3%)</td>
<td>1 (33.3%)</td>
<td>43 (47.8%)</td>
</tr>
<tr>
<td>Injury (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achilles tendinopathy</td>
<td>92 (31.7%)</td>
<td>91 (32.0%)</td>
<td>26 (29.9%)</td>
<td>2 (66.7%)</td>
<td>28 (31.1%)</td>
</tr>
<tr>
<td>Plantar fasciitis</td>
<td>148 (51.0%)</td>
<td>145 (51.1%)</td>
<td>41 (47.1%)</td>
<td>1 (33.3%)</td>
<td>42 (46.7%)</td>
</tr>
<tr>
<td>Other</td>
<td>50 (17.2%)</td>
<td>48 (16.9%)</td>
<td>20 (23.0%)</td>
<td></td>
<td>20 (22.2%)</td>
</tr>
<tr>
<td>Years of treatment (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>51 (17.6%)</td>
<td>50 (17.6%)</td>
<td>11 (12.6%)</td>
<td></td>
<td>11 (12.2%)</td>
</tr>
<tr>
<td>2007</td>
<td>60 (20.7%)</td>
<td>59 (20.8%)</td>
<td>18 (20.7%)</td>
<td></td>
<td>18 (20.0%)</td>
</tr>
<tr>
<td>2008</td>
<td>63 (21.7%)</td>
<td>61 (21.5%)</td>
<td>20 (23.0%)</td>
<td></td>
<td>20 (22.2%)</td>
</tr>
<tr>
<td>2009</td>
<td>89 (30.7%)</td>
<td>87 (30.6%)</td>
<td>28 (32.2%)</td>
<td>2 (66.7%)</td>
<td>30 (33.3%)</td>
</tr>
<tr>
<td>2010</td>
<td>5 (1.7%)</td>
<td>5 (1.8%)</td>
<td>1 (1.1%)</td>
<td></td>
<td>1 (1.1%)</td>
</tr>
<tr>
<td>2011</td>
<td>22 (7.6%)</td>
<td>22 (7.7%)</td>
<td>9 (10.3%)</td>
<td>1 (33.3%)</td>
<td>10 (11.1%)</td>
</tr>
</tbody>
</table>
Table 3 – Summary of impression of value of ESWT

<table>
<thead>
<tr>
<th>Question: How are your symptoms now compared to just before your first treatment?</th>
<th>Cured</th>
<th>Cured, reduced exercise</th>
<th>Much better</th>
<th>Slightly better</th>
<th>Similar</th>
<th>Slightly worse</th>
<th>Much worse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responses</td>
<td>26 (28.9%)</td>
<td>15 (16.7%)</td>
<td>24 (26.7%)</td>
<td>8 (8.9%)</td>
<td>13 (14.4%)</td>
<td>3 (3.3%)</td>
<td>1 (1.1%)</td>
</tr>
</tbody>
</table>

| Question: How much exercise/activity are you now able to do? | Exercise fully | Exercise with mild limitations | Only restricted exercise |
|---|---|---|
| Responses | 28 (31.1%) | 41 (45.6%) | 21 (23.3%) |

<table>
<thead>
<tr>
<th>Question: What is your impression of the value of the treatment in helping treat your condition?</th>
<th>I am sure that it completely cured me</th>
<th>I am sure that it made my condition better</th>
<th>I think it made my condition better</th>
<th>It did not make my condition better/worse</th>
<th>I think it made my condition worse</th>
<th>I am sure it made my condition worse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responses</td>
<td>17 (18.9%)</td>
<td>19 (21.1%)</td>
<td>24 (26.7%)</td>
<td>29 (32.2%)</td>
<td>1 (1.1%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question: With the benefit of hindsight, would you have the treatment again for the condition?</th>
<th>I would definitely do it again</th>
<th>I would probably do it again</th>
<th>I might but I am not sure if it helped</th>
<th>I would not because it did not work</th>
<th>I would not because it might have made it worse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responses</td>
<td>37 (41.1%)</td>
<td>15 (16.7%)</td>
<td>17 (18.9%)</td>
<td>20 (22.2%)</td>
<td>1 (1.1%)</td>
</tr>
</tbody>
</table>

The reasons why

In our study the postal survey turned out to be far more successful than the internet survey. However, there were problems with the internet survey website being offline right after delivery of the survey during the first pilot, but even in both the second pilot and in the prospective mixed-mode study the website was barely used.

We hypothesized that the internet would yield superior results in a sports medicine population. After reading the available literature we became less confident but we did not suspect that our web-based response rate would be so poor.

The response rate generated by the paper-based administration was just 30.6% which is substantially lower than the 45% response rate reported for paper surveys.3

The primary failure in this study was a catastrophic website error. Whilst it would be easy to dismiss this as being an error that “should not have happened” and therefore should not be reported on, the potential for a website to ‘crash’ is ever present and in this case it severely affected our study results.

“...an email may: be less highly rated than a letter, be deleted as it was thought to be spam, be less noticed in an array of emails in an inbox, not evoke the same obligation of ‘return’, not be as ‘trusted’, i.e. people are more aware of the hazards of the internet and may be less likely to complete internet surveys.

The website failure may have also affected the response rate for the paper-based survey, since some patients who tried to log into the website and found the site down probably did not bother to return a paper questionnaire in lieu. However there may be other explanations for the poor response rate. For example, an email may: be less highly rated than a letter, be deleted as it was thought to be spam, be less noticed in an array of emails in an inbox, not evoke the same obligation of ‘return’, not be as ‘trusted’, i.e. people are more aware of the hazards of the internet and may be less likely to complete internet surveys.

Although we hypothesized that sports medicine patients may be more likely to reply to an internet survey than a paper-based one, perhaps our choice of treatment (ESWT) did not reflect the ‘average’ sports medicine patient. The vast majority of patients suffered from calcific Achilles tendinopathy or plantar fasciitis and the average age was over 50.
We not only found that these patients preferred paper surveys but also that older patients had a higher response rate than younger patients.

One further weakness in our study was that we did not send out any reminders which have been a proven effective way to significantly raise the response rate, especially for paper-based administration. We did not feel that it was fair, in the circumstances, to follow up non-respondents when a major reason for the non-respondents was that the website we designed had crashed, particularly when the primary research question had been answered (i.e. that paper questionnaires were clearly showing superior results).

“Web surveys could be completed far more cheaply using a generic survey site like Survey Monkey or Zoomerang, however these websites are not designed with medical confidentiality in mind.”

Because of time constraints, we perhaps did not allow enough time to receive all surveys, although it is likely that if any replies are received after the closing date that these will be paper surveys rather than surveys completed online. In a paper comparing the response rate and time of an email and a postal mail survey an average response time of 33 days was reported for the first mailing. Another proven way to increase the response rate is to notify participants before sending out questionnaires. In our study we only did this in our prospective mixed-mode group who were asked to participate during their treatment. According to the Cochrane review, the odds of response are increased by half if participants were notified up front.

In contrast to the results found in other studies, in our research the mail arm turned out to be a lot cheaper than the internet arm. The main reason for this was the size of our study cohort. Initial high development costs of the website were split among a small group size which made the costs per outgoing invitation a lot higher as compared to the internet survey. There would also be monthly maintenance fees to keep a custom-made website online. Web surveys could be completed far more cheaply using a generic survey site like Survey Monkey or Zoomerang, however these websites are not designed with medical confidentiality in mind.

Both the internet survey and the postal survey did not reach an acceptable response rate (>=70%). With the low response rates observed (1.1% for internet and 30.6% for postal) the results when considering patient satisfaction rates may not be reliable. Even though we did not reach the follow up rate we hoped for, the results of the survey shows that the patient satisfaction rates for ESWT seem to be good. Over 65% of the patients stated that their injury was improved by the treatment and almost 20% of the patients were even sure that they were completely cured by the shock wave treatment. The treatment is mostly used for treating plantar fasciitis and (calcific) Achilles tendinopathy. Both are complex and not well understood injuries. There is often little explanation about why one person gets the injury and the other does not. Also the best treatment is not clear with different people responding different to a range of offered treatments.

Victor van den Berg
Dr John Orchard

References, as indicated within the article, are available at sma.org.au/publications/sport-health/
Management of concussion in Australian football and rugby union

So before outlining the guidelines, what is concussion?
Concussion falls into the milder spectrum of traumatic brain injury and reflects a disturbance in brain function caused by a direct or indirect force to the head. Common symptoms include headache, blurred vision, dizziness, nausea, balance problems, fatigue and feeling ‘not quite right’. Other common features include confusion, memory loss and reduced ability to think clearly and process information. It often does not involve loss of consciousness. Loss of consciousness is seen in only 10–20% of cases of concussion in Australian football. The changes are temporary and the majority of players recover completely if managed correctly. The recovery process is variable from person to person and injury to injury. A person may recover quickly or it could take weeks. Despite this, all concussions must be taken extremely seriously.

The guideline basics
The fundamentals of the guidelines include:

- Concussion must be taken extremely seriously to safeguard the long term welfare of players.
- Players suspected of having concussion must be removed from play and must not resume play in the match.
- Players suspected of having concussion must be medically assessed.
- Players suspected of having concussion or diagnosed with concussion must go through a graduated return to play protocol.
- Players must receive medical clearance before returning to play or contact training.

However there are minor variations in the guidelines. Following is a summary of the key points of each separated into those for medical practitioners/healthcare professionals and those for the broader sporting community.
For the full details of the guidelines visit:
IRB: www.irbplayerwelfare.com/?documentid=3

What is the SCAT 2?
A tool that represents a standardised method of evaluating injured athletes for concussion and can be used in athletes from 10 years and older. Download at www.cces.ca/files/pdfs/SCAT2[1].pdf. Download the pocket SCAT 2 at www.irbplayerwelfare.com/pdfs/Pocket_SCAT2_EN.pdf

A look into the recently updated concussion policies of two of Australia’s biggest sports; Australian football and rugby union. What is similar; what is different?

There has been a lot of press about concussion recently. And rightly so. It’s a big deal. Any injury involving the head is. The importance of the issue is emphasised by the Australian Football League (AFL) and International Rugby Board (IRB – rugby union) recently introducing new concussion guidelines to limit the impact of head injuries in these sports.

It’s reassuring that both sets of guidelines from these respective codes are closely aligned. Both emphasise the importance of effectively managing players as a means of protecting their long term health and welfare. Both have been designed for use by physicians and other health professionals, as well as team management, teachers, parents and players.
IRB concussion guidelines

When a medical practitioner/healthcare professional is present

The key components of management of concussion in rugby union when a medical practitioner/healthcare professional is present include:

Diagnosis and management of concussion

- The player will be examined and if any signs of concussion are evident and/or the player fails to answer correctly five memory questions (from Pocket Sport Concussion Assessment Tool – SCAT 2) the player MUST be removed from the field of play for a comprehensive medical evaluation.
- The player MUST NOT resume play once removed from the field for suspected concussion.
- A medical practitioner can use the SCAT 2 or other diagnostic tools to assist in the comprehensive medical evaluation of players with concussion or suspected concussion.

Graduated Return to Play (GRTP)

- Management of GRTP should be undertaken on a case by case basis and with the full cooperation of the player.
- It is important that concussion is managed so that there is physical and cognitive rest until there are no remaining symptoms.
- Activities that require concentration and attention should be avoided until symptoms have been absent for a minimum of 24 consecutive hours without medication.
- When a medical practitioner is managing the recovery of a player it is possible for the player to return to play after a minimum of six days having successfully followed and completed each stage of the GRTP protocol.
- The medical practitioner may observe the player at each stage of the GRTP protocol (see Diagram 1) but may also delegate the observation to a healthcare professional while remaining responsible for the management of the protocol.
- Provided that the player with concussion or suspected concussion is, and remains, symptom free the player may commence the GRTP.

Adolescents and children must not return to play without a clearance from a medical practitioner. In Australia, all players must have a clearance from a medical practitioner before returning to play.
When a medical practitioner/healthcare professional is not present

The key components of management of concussion in rugby union when a medical practitioner/healthcare professional is NOT present include:

Diagnosis and management of concussion
- Those who observe an injured player displaying any concussion symptoms after an injury event with the potential to cause a head injury or concussion MUST do their best to ensure that the player is removed from the field of play in a safe manner.
- The player must not be left on their own and must not be allowed to drive a vehicle.
- If a medical practitioner is not available onsite the player must be referred to a medical practitioner for diagnosis and comprehensive assessment ASAP.
- The Pocket SCAT 2 can be used to identify a suspected concussion where a medical practitioner is not present at the time of incident.
- If a player has any concussion symptoms, fails to answer any of the memory questions correctly in the Pocket SCAT 2, makes more than five errors in the balance test in Pocket SCAT 2 or there are any concerns that the player is suspected of having concussion, then concussion must be suspected and the player must be removed from play and referred to a medical practitioner or emergency department.

Graduated Return to Play (GRTP) NOT managed by a medical practitioner
- Management of GRTP should be undertaken on a case by case basis and with the full cooperation of the player.
- It is important that concussion is managed so there is physical and cognitive rest until there are no remaining symptoms.
- Activities that require concentration and attention should be avoided until symptoms have been absent for a minimum of 24 consecutive hours without medication.
- There is a 14 day stand down period for players whose GRTP is not managed by a medical practitioner.
- If a player has shown signs of concussion that player must be treated as having suspected concussion and must not play until at least the 21st day after the incident and should follow the GRTP process outlined in Diagram 2.

Adolescents and children must not return to play without a clearance from a medical practitioner. In Australia, all players must have a clearance from a medical practitioner before returning to play.
AFL concussion guidelines

When a medical practitioner/healthcare professional is present

The key components of management of concussion in Australian football when a medical practitioner/healthcare professional is present include:

1. Confirming the diagnosis
   - Concussion should be suspected in any player that presents with any symptoms (these include headache, nausea, dizziness and balance problems, blurred vision or other visual disturbance, confusion, memory loss and a feeling of slowness or fatigue) following a collision or direct trauma to the head or neck.
   - Clinical features that are more specific to a diagnosis of concussion include: loss of consciousness (LOC), concussive convulsions, confusion and/or attention deficit, memory disturbance and balance disturbance. These features however, may not be present in all cases; for example LOC is seen in only 10–20% of cases of concussion in Australian football. This rate is similar to other sports internationally.
   - Questioning close relatives, especially parents or guardians in the case of children and adolescents, is often valuable. Any report that the individual ‘does not seem right’ or ‘is not themselves’ following trauma, is strongly suggestive of a concussive injury.
   - The use of a graded symptom checklist is often helpful, i.e. SCAT 2.
   - In a concussed individual with adverse warning signs (i.e. high velocity of impact or collision, immediate and/or prolonged LOC, a focal neurological deficit or progression of clinical features), urgent computerised tomography (CT brain scan) is required to exclude intracranial haemorrhage.
   - Following an uncomplicated concussion, however, conventional imaging techniques such as skull x-ray, CT brain scan and magnetic resonance brain imaging (MRI) are typically normal.

2. Determining when the player has recovered so that they can safely return to competition
   - Expert consensus guidelines recommend that players should not be allowed to return to competition until they have recovered completely from their concussive injury. There is no single gold standard measure of brain disturbance and recovery following concussion. Instead, clinicians must rely on indirect measures to inform clinical judgment. In practical terms this involves a comprehensive clinical approach, including:
     a) A period of cognitive and physical rest to facilitate recovery;
     b) Monitoring for recovery of post-concussion symptoms and signs;
     c) The use of neuropsychological tests to estimate recovery of cognitive function;
     d) Graduated return to activity with monitoring for recurrence of symptoms, and
     e) A final medical clearance before resuming full contact training and/or playing.

3. Game-day evaluation and treatment
   - The same basic management plan applies to concussive injuries being managed on game day. The main difference is that players assessed on game day should not be returned to play on the day of their injury.
   - With all concussive injuries, the critical game day management relates to the basic first aid principles, which apply when dealing with any unconscious player (i.e. airway, breathing, circulation). Care must be taken with the player’s cervical spine, which may have also been injured in the collision.
   - The key components of game day concussion management involve making an accurate diagnosis, differentiating concussion from structural pathologies and careful monitoring of the injured player.
When a medical practitioner/healthcare professional is not present

The key components of management of concussion in Australian football when a medical practitioner/healthcare professional is NOT present include:

1. **Recognising the injury (making a diagnosis of concussion)**
   - Know the symptoms to look for.
   - Use tools such as the pocket SCAT 2 to help make a diagnosis.
   - Note: sideline concussion evaluation tools are designed to help make a diagnosis and are not meant to replace a more comprehensive medical assessment and should never be used as a stand alone tool.

2. **Removing the player from the game**
   - Any player with a suspected concussion must be removed from the game.
   - Any player who has suffered a concussion should not be allowed to return to play in the same game.

3. **Referring the player to a medical doctor for assessment**
   - All players with concussion or suspected concussion need an urgent medical assessment with a registered medical doctor. If a doctor is not available at the venue then they should be sent to a local general practitioner or hospital emergency department.
   - Keep a list of local doctors and the emergency department on hand.

4. **Managing of the unconscious player and when to refer to hospital**
   - Urgent hospital referral is necessary if there is any concern regarding the risk of a structural head or neck injury.
   - Indications for urgent referral to hospital include:
     - Any player with loss of consciousness or seizures.
     - Any player with persistent confusion.
     - Any player who deteriorates after their injury.
     - Any player who reports neck pain or spinal cord symptoms (numbness, tingling, weakness).
   - If in doubt, refer.

5. **Follow up management**
   - Any concussed player must not be allowed to return to play before having a medical clearance.
   - The decision to return to play/training should be made by a medical doctor with experience in managing concussion.

6. **Return to play**
   - Players should be returned to play in a graduated fashion.

For the full guidelines visit:
IRB: www.irbplayerwelfare.com/?documentid=3

These guidelines have been written by Sport Health Editor, Amanda Boshier in consultation with Dr Rob Reid.
Refshauge Lecturer
Professor Ken Fitch (OAM)

“Asthma, exercise and the athlete – an overview of four decades of researching these topics and their inter-relationships”

Australian Sports Medicine Federation Fellows Sponsored Speaker

Ken Fitch was a Medical Consultant from 1965–93 at the University of Western Australia before becoming an Adjunct Professor at the University’s School of Sports Science, Exercise and Health in 1993. He has worked as a Sports Physician in private practice from 1986 until 2004, and was also a Physician and Head of the Sports and Soft Tissue Injury Clinic, Department of Orthopaedic Surgery at the Royal Perth Hospital from 1969 until 2001. Since then, he has gone on to fulfill the role of Emeritus Consultant in Sports Medicine. He is the Chairman of the Medical Advisory Committee for the Australian Sports Anti-Doping Agency; Member of the Medical Commission for the Australian Olympic Committee; Member of the Australian Doping Research Panel and is a Fellow of the American College of Sports Medicine and Sports Medicine Australia.

Professor Martin Hagger

“Promoting kids’ sport and physical activity in physical education contexts: Can it really make a difference outside of school?”

“Effects of an intervention based on self-determination theory on self-reported leisure-time physical activity participation”

Mr Mark Fenton

“Overcoming the cholera of the 21st century: Inoculating communities against inactivity”

Physical Activity Taskforce Sponsored Speaker

Mark Fenton is a vocal pedestrian and bicycle advocate and recognised authority on public health issues and the need for community, environmental, and public-policy initiatives to encourage more walking and bicycling. His expertise includes planning policies and engineering approaches to create active living environments, and he serves on his local planning board. Mark is a contributing editor for Health magazine, was host of the America’s Walking series on PBS television, and is author of numerous books including Pedometer Walking and The Complete Guide to Walking for Health, Weight Loss, and Fitness. He’s a facilitator with the Walkable Community Workshop series of the National Center for Bicycling and Walking and a Safe Routes to School National Program Developer and Instructor for the University of North Carolina’s Pedestrian and Bicycle Information Center.

Dr Richard Bouché

“Medial tibial stress syndrome”
“1st MTPJ Fusion: Can the athlete still function?”

Asics Sponsored Speaker

Dr Richard Bouché graduated from Illinois Benedictine College in Lisle, IL with a bachelor’s degree in Biology in 1975. After a year sabbatical, he attended the Illinois College of Podiatric Medicine in Chicago, IL and graduated in 1980. He completed a two year residency in foot and ankle surgery at the Northwest Podiatric Surgical Residency Program in Seattle, WA. After one year in private practice, he joined the Virginia Mason Medical Center in Seattle and practiced for 20 years in the Orthopedic Surgery and Sports Medicine Departments. He presently works at The Sports Medicine Clinic in North Seattle. Dr Bouché is Special Editor (Sports Medicine) for the Journal of Foot & Ankle Surgery, board certified by the American Board of Podiatric Surgery, a Fellow in the American College of Foot and Ankle Surgeons, and Past President of the American Academy of Podiatric Sports Medicine.

Martin Hagger obtained his undergraduate degree and PhD in exercise psychology from Loughborough University in the UK and has worked in Psychology Schools at the Universities of Sheffield, Essex, and Nottingham. He is currently Professor of Psychology in the School of Psychology and Speech Pathology at Curtin University, Perth, Australia. Professor Hagger’s research interests are the motivation and self-regulation of health behaviour. He is interested in how people’s beliefs, attitudes, intentions, and motives affect their behaviour and what health professionals can do to change health-related behaviour. His research applies motivational theories to understand, intervene and change health behaviours particularly young people’s sport and physical activity. He is editor-in-chief of Health Psychology Review and Psychology of Sport and Exercise, associate editor of Stress and Health and editorial board member of five other international peer-reviewed journals.
Professor Romain Meeusen

“Exercise performance in the heat – can the brain be manipulated?”

“Nutrition and the brain”

Qualisys Sponsored Speaker

Romain Meeusen is Head of the Department of Human Physiology at the Vrije Universiteit Brussel. His research is focused on ‘exercise and the brain’ exploring the influence of neurotransmitters on human performance and training. His recent work focuses on thermoregulation, overtraining syndrome, and neurogenesis. He teaches exercise physiology, training and coaching, and sports physiotherapy and has published over 350 articles and book chapters in peer-reviewed journals, 18 books on sport physiotherapy, and has given lectures at more than 650 national and international conferences. He is President of the Belgian Federation of Sports Physiotherapy, Secretary General of the European College of Sport Science, and Board member of the American College of Sports Medicine. In 2009 he received the Belgian ‘Francqui Chair’ at the Université Libre de Bruxelles on exercise and the brain.

Invited Speakers

Winthrop Professor Daniel Green

“Exercise as cardiovascular medicine: An update of the direct impacts of exercise on the heart and arteries in humans”

Danny Green is currently Winthrop Professor at the School of Sports Science, Exercise and Health at The University of Western Australia and Professor of Cardiovascular Physiology at the Research Institute for Sport and Exercise Sciences, Liverpool John Moores University. He completed a BSc (Hons) and PhD (University of Western Australia) and has worked in Australia, the US and UK. His research revolves around exercise, exercise training and physical activity in the prevention of cardiovascular disease. This includes the best combinations of exercise, pharmacological and other preventive measures to minimise future development of atherosclerosis in young people at risk and re-occurrence of cardiovascular disease in older individuals. His research encompasses the lifespan; from exercise training in the prevention of the development of atherosclerosis in obese children and adolescents, to research on the best combination of exercise and medications in the management of patients with hypercholesterolemia, diabetes, coronary disease and end-stage heart failure patients awaiting cardiac transplantation.

Dr Mary Magarey

“Clinical reasoning and management of a throwing athlete presenting with a shoulder injury”

Mary Magarey is a Specialist Musculoskeletal Physiotherapist and Specialist Sports Physiotherapist, and Senior Lecturer in the School of Health Sciences, University of South Australia, where her primary responsibility is classroom, laboratory and clinical education on the Master of Musculoskeletal and Sports Physiotherapy program. Mary completed her PhD in shoulder diagnosis in 1999 and has been involved in research, education and clinical practice related to the shoulder region for more than 20 years. She was awarded her Fellowship in Musculoskeletal Physiotherapy by the Australian College of Physiotherapists in 2009 and her Fellowship in Sports Physiotherapy in 2010.
## Conference Program

### Wednesday 19th October

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>0900 – 1630</td>
<td>AAPSM Board meeting (Terrace Room)</td>
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<tr>
<td>1300 – 1630</td>
<td>SMA Board meeting (Rottnest Room)</td>
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<tr>
<td>1700 – 1800</td>
<td>Official opening ceremony (Orion &amp; Pleiades Room)</td>
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<tr>
<td>1700 – 1800</td>
<td><strong>Keynote:</strong> Mark Fenton “Overcoming the Cholera of the 21st Century: Inoculating communities against inactivity”</td>
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<tr>
<td>1800 – 1930</td>
<td>Welcome reception (Resort Poolside) (ticketed event)</td>
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### Thursday 20th October

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<thead>
<tr>
<th>Time</th>
<th>Orion Room</th>
<th>Pleiades Room</th>
<th>Carnac Room</th>
<th>Garden Room</th>
<th>Rottnest Room</th>
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<td>0900 – 0930</td>
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<tr>
<td>0930 – 1030</td>
<td><strong>Keynote:</strong> Romain Meeusen “Exercise performance in the Heat – can the Brain be manipulated?”</td>
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<td>1030 – 1100</td>
<td>Morning tea (Promenade bar)</td>
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<tr>
<td>1100 – 1230</td>
<td>Invited: Mary Magarey “Clinical reasoning and management of a throwing athlete presenting with a shoulder injury”</td>
<td>Symposium: Developing evidence-informed exercise guidelines to prevent lower limb injuries among community Australian Football players — the NoGAPS project</td>
<td>Symposium: Influence of development, exercise and disease on tendon and muscle mechanics</td>
<td>Free papers: Physical activity — older adults</td>
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<tr>
<td>1230 – 1330</td>
<td>Lunch (Restaurant &amp; Promenade bar)</td>
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<td>Free papers: Physical activity — interventions, policy and advocacy</td>
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<tr>
<td>1330 – 1500</td>
<td>Invited: Rob Newton “Exercise is medicine for chronic disease management”</td>
<td>Free papers: Groin / football</td>
<td>Free papers: The anti-doping landscape now and beyond — A practical guide to assist athlete support personnel in the prevention of doping</td>
<td>Free papers: Training effects</td>
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<tr>
<td>1500 – 1530</td>
<td>Afternoon tea (Promenade bar)</td>
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<tr>
<td>1530 – 1630</td>
<td><strong>Refshauge Lecture:</strong> Ken Fitch “Asthma, Exercise and the Athlete — an overview of four decades of researching these topics and their inter-relationships”</td>
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<td>1630 – 1700</td>
<td>1630 – 1700 AAPSM AGM</td>
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<tr>
<td>1630 – 1730</td>
<td>Trade exhibition opening (Indian Ocean Suite)</td>
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<tr>
<td>1830 – 2300</td>
<td>ASMF Fellows dinner (The View Restaurant Fremantle) (ticketed event — not included in registration; only open to ASMF Fellows and their invited guests)</td>
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### Friday 21st October

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<td>0900 – 0930</td>
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<tr>
<td>0930 – 1030</td>
<td><strong>Keynote:</strong> Martin Hagger “Promoting kids’ sport and physical activity in physical education contexts: Can it really make a difference outside of school?”</td>
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<td>1030 – 1100</td>
<td>Morning tea (Trade exhibition)</td>
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<tr>
<td>1230 – 1330</td>
<td>Lunch (Trade exhibition)</td>
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<tr>
<td>1330 – 1500</td>
<td>Multidisciplinary Grand Round</td>
<td>Free papers: Orthotics and lower limb</td>
<td>Invited: Romain Meuseen “Nutrition and the Brain” and Free papers: Supplements</td>
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<tr>
<td>1500 – 1545</td>
<td>Afternoon tea (Trade exhibition)</td>
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<td>1645 – 1700</td>
<td>Change over</td>
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<tr>
<td>1700 – 1830</td>
<td>Poster session (Island Suite)</td>
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<tr>
<td>1900 – Late</td>
<td>Group dinners (ticketed events – not included in registration)</td>
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### Saturday 22nd October

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<tr>
<th>Time</th>
<th>Orion Room</th>
<th>Pleiades Room</th>
<th>Carnac Room</th>
<th>Garden Room</th>
<th>Rottnest Room</th>
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<tbody>
<tr>
<td>0800 – 0900</td>
<td>Workshop: Jeni Saunders “Ultrasound guided injections for tendonopathies: A user’s guide”</td>
<td>Workshop: Eamon Koh “How read a wrist MRI”</td>
<td>Workshop</td>
<td>Workshop: Rob Naish “Taping foot and lower limb – the different and difficult”</td>
<td>Workshop</td>
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<td>0900 – 0930</td>
<td>Change over</td>
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<tr>
<td>0930 – 1030</td>
<td><strong>Invited:</strong> Richard Bouché “1st MTPJ Fusion: Can the Athlete Still Function?” 1000 – 1030</td>
<td><strong>Invited:</strong> Erik Witvrouw “The rationale for stretching”</td>
<td>Free papers: Rehabilitation and return to sport after injury</td>
<td>Free papers: Response to strenuous exercise</td>
<td>Free papers: Physical activity – adults epidemiology</td>
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<tr>
<td>1030 – 1100</td>
<td>Morning tea (Trade exhibition)</td>
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<tr>
<td>1100 – 1230</td>
<td>Multidisciplinary Grand Round</td>
<td>Free papers: Knee injury and pain</td>
<td>Training effects themed poster session</td>
<td>Free papers: Exercise and recovery</td>
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<tr>
<td>1230 – 1330</td>
<td>Lunch (Trade exhibition)</td>
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<tr>
<td>1330 – 1430</td>
<td><strong>Keynote:</strong> Erik Witvrouw “Patellofemoral problems concerning etiogenesis and prevention”</td>
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<td>Workshop: Mark Fenton “Walk audit”</td>
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<tr>
<td>1430 – 1500</td>
<td>Afternoon tea (Promenade bar)</td>
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<tr>
<td>1500 – 1630</td>
<td>“Best of the Best”</td>
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<tr>
<td>1630 – 1700</td>
<td>Best paper winners re-present to determine Asics Medal winner for Best Conference Paper</td>
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<tr>
<td>1900 – Late</td>
<td>Conference dinner (Southern Cross Ballroom)</td>
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<td>Theme: TBA (ticketed event)</td>
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</table>
Registration Form

Contact Details

Title........................................ First Name........................................ Last Name........................................ DOB........................................ Gender M / F

Profession / Position............................................................... Membership No........................................

Organisation / Discipline Group............................................................

Postal 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 - $215

Student Member - $55

Conference Registration

Early Bird Registration

On or before 31 July 2011

SMA Member Registration - Full $685

SMA Member Registration - Student* $520

Non Member Registration - Full $945

Non Member Registration - Student* $620

One Day Registration.* (Please Tick ☐ which day you would like to attend)

☐ Thurs 20 October (includes Wed 19 October)  ☐ Fri 21 October  ☐ Sat 22 October

Registration - Full or Student $300

Late Registration

On or after 1 August 2011

$785

$620

$1045

$720

Sub Total AUD$

Social Program

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

Welcome Reception (Wed 19 October) $nil

ASMF Fellows Dinner (Thurs 20 October)* $80

Conference Dinner (Sat 22 October)* $nil

*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
P: +61 2 6230 6671
F: +61 2 6230 6676
E: 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 Orion and Pleiades Room at the Esplanade Hotel Fremantle, on Saturday October 22 at 4.30pm.

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:
- President
- Vice President
- Financial Director
- Disciplines Director
- NSW
- SA
- QLD

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 of auditors
8. Special business
9. Close

I hereby nominate _______________________________ of _______________________________ 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 5PM (EST) ON OCTOBER 1, 2011

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

Do you need a social media presence?
Brought to you by Great 2 Tweet U

It’s a question that is becoming more and more relevant to business. It’s hard to ignore a medium that can reach more than 500 million people around the world everyday.

If Facebook was a country it would be ranked third in population behind China and India. And if current trends are anything to go by then not having a social media presence means you’re fast becoming the minority.

A global survey from workplace relations firm Regus has found that 40% of Australian businesses are successfully winning new customers through business social networking activity. The research also reveals that globally more firms are using social media to connect and engage with existing customers.

The Regus Social Recovery Report reveals:
- Globally there has been a rise of 7% in the proportion of businesses successfully recruiting new customers through social networks such as Facebook.
- 52% of businesses globally and 48% in Australia use websites such as Twitter and Weibo to engage, connect with and inform existing customers.
- In Australia 52% of firms encourage their employees to join social networks such as LinkedIn, Xing and Vimeo, compared to 53% globally.
- Two fifths (39%) of companies globally and over a third in Australia (35%) devote up to 20% of their marketing budget to business social networking activity.
- Over a third (36%) of Sydney businesses devote up to 20% of their marketing budget to social networking activity, followed by Brisbane (35%), Melbourne and Perth (34%), and Adelaide (33%).

Social networking has fully evolved from a nice-to-have to a necessity as the majority of businesses in Australia (68%), and internationally (74%) agree that without social media activity marketing strategies cannot hope to be successful. Nevertheless, Australian and global firms are also emphasising the need for a balance of marketing media, confirming their belief that without a combination of traditional and digital techniques marketing campaigns will not work (61%).

The beauty of using social media for marketing is it moves away from traditional advertising and becomes more like a source of information. By setting up a fan page on Facebook and a Twitter account you can make your clients feel like part of the family. They are able to interact on your page, and this helps build a relationship with them that goes beyond client – provider. It’s also an excellent way to retain customers, the more they hear from you, the more they will use your service when they need it.

Great 2 Tweet U are the social media specialists who manage your Facebook and Twitter presence. Headed by Daniel Hoy, Herald Sun journalist, they can help you to produce a consistent, well-planned message that helps grow and promote your brand. Drive sales, build brand awareness, increase customers or simply connect more regularly with the customers you have. For more information email daniel@great2tweetu.com.au
Brand basics
Brought to you by ZOO Advertising

ZOO.

There’s a lot of talk in business about ‘brand’ right now. In many ways, it’s replaced advertising and marketing as the buzz word of the moment. But how many businesses really understand what a brand is?

More than a logo
Much more, in fact – though it’s easy to see where the confusion comes from. Logos, or brandmarks, have been around for a very long time – perhaps thousands of years – and were an obvious way to identify individual traders in an era when not many people could read or write.

But over the last hundred years or so, things have changed, and a logo is only a small part of what a brand is.

In fashion
Perhaps the easiest way to understand what a brand is and what it does is to think about fashion.

All designers are different, and one tailor may be better than another, but when you look at what people are wearing, what matters most is the name on the label.

But it’s a little more complicated than that. Because it’s not actually the name itself, nor the look of the label – though those things help – but the whole cluster of thoughts and feelings that that label brings to mind.

Some, like Armani, represent the height of trés chic. Others, like Cotton On, have a more casual feel. And some stand for a way of life – the most obvious being Nike, with its famous tagline, ‘Just do it’.

A big difference
Think of the difference between Apple and IBM. In fact, if you remember those ‘I’m a Mac/I’m a PC’ TV ads from a few years back, they perfectly demonstrate the difference between the two brands – even though they’re obviously written from Apple’s point of view.

Of course, there are real and important differences between IBM and Apple. But the most important differences – when it comes to who buys what sort of computer – are all about brand.

If you close your eyes and picture a typical Apple user, you might imagine a graphic designer in jeans, or a cool, sophisticated interior designer. What you probably won’t picture is an accountant in a suit and tie.

Look around
Forty years ago, brands just kind of evolved. Nowadays, though, organisations – including retailers like Aesop and T2 – put a lot more thought into their brands, and what they stand for.

So the next time you find yourself attracted to a particular brand, take a closer look for the ways in which it’s been designed to appeal to you.

ZOO is a full service agency specialising in advertising, design and digital solutions for everyone from small businesses all the way up through to large government departments. Whether it’s great strategic thinking, amazing creativity, business smarts, or just a genuinely friendly way of answering the phone, ZOO has built a reputation on being one of Canberra’s most interesting and premier communication professionals.

For more information visit www.zooadvertising.com.au
Superannuation

Brought to you by Dominic Morello – Davidsons

The Australian superannuation system is regularly quoted as being the envy of the world. We are one of the few countries that has a mandated system and since its introduction (early 90’s) the industry has grown rapidly. It is now estimated that over a trillion dollars is held in Australian superannuation accounts.

It is a much regulated system and has extremely complex rules regarding contributions, withdrawals, pensions; especially around the tax treatment of each of these. This article by no means will be able to explore all these intricate issues however should provide a basic snapshot on some of the main points. We recommend that you seek professional advice regarding your personal circumstances.

Superannuation Guarantee Scheme

The Superannuation Guarantee Scheme requires employers to pay 9% of remuneration into a superannuation fund on behalf of employees. These employer superannuation contributions must be paid quarterly.

Since 2005, many Australian employees have been able to choose the fund their employer’s superannuation guarantee contributions can be paid to. The choice of superannuation funds allows workers to better manage their superannuation and have one single account should they wish.

The current 2011/12 individual concessional contribution limits including contributions made under salary sacrifice arrangements are $25,000 and $50,000 for individuals 50 years or older. Although, the government has announced changes to reduce these limits over the next few years for people over 50.

Along with concessional (tax deductible) contributions, individuals can make non-concessional or after tax contributions to superannuation. The current cap on these non-concessional contributions is $150,000 per person in a financial year. There are also transitional arrangements that allow this yearly cap to be brought forward to enable three years non-concessional contributions to be made in one year as long as no further contributions are made in the following years.

Super Co- Contribution

The Super Co- Contribution scheme assists people that contribute after tax dollars into super. The scheme works by having the Government match the personal contribution with a super co-contribution payment to the super fund provided the individual’s income is below the current year threshold of $61,920. Noting this co-contribution amount can be as high as dollar for dollar up to $1,000 for those people earning less than $31,920 per year but does reduce over this income level.

Do-It-Yourself Super Funds

The vast majority of the superannuation accounts of Australians are currently held in large Industry or Retail Superannuation Funds. However the past few years has seen a large growth in Self-Managed or Do-It-Yourself (DIY) Super Funds. It is estimated that DIY Funds now make up more than 30% or approximately $400 billion of superannuation savings.

The growth in DIY funds over the years has been driven mainly by people wanting to control their own superannuation. This added control has many benefits which can include the flexibility to control costs, invest in specific assets and often direct property as well as estate planning benefits and flexibility around retirement.

However there are a number of issues that need to be considered before setting up a DIY fund as they are definitely not for everyone. In order to have a DIY fund the members of the fund must also be trustees of the fund. The responsibilities and obligations of Trustees of super funds are extensive and enforceable by the ATO who have had an increased focus recently on Trustees of DIY funds.

Davidsons Accountants and Business Consultants specialised service offerings of Tax, Audit, Financial Services, Personal Insurances and Self Managed Superannuation can provide you with all the information, assistance and advice regarding your superannuation requirements. For more information visit www.davidsons.com.au.
Writing a job description
Brought to you by Bill Haggerty – BGH International

An employee has left your company; did you undertake an exit interview to determine why? How many people have been in that role over the past few years, has there been high turnover? Why is that so? Not everybody could have been that poor a performer.

The consequences of an employee leaving your business are twofold. Firstly it has an impact on the morale of the remaining employees, which is often negative; i.e. the additional stress that is placed on existing employees who have to cover that position until another person is appointed. It can also affect your credibility with your clients, particularly if there has been a high turnover in that position.

Secondly there is the financial cost of having to go through the recruitment process; it has been estimated that it can cost up to 1.5 times that person’s annual remuneration, which is represented in recruitment costs, loss of sales and the impact on your and other employees’ time.

A critical success factor in ensuring your search for the right candidate is successful is a concise and accurate job description. The successful candidate doesn’t want to encounter any surprises once they are employed. Does the role report to you? If not discuss it with the person who is responsible; ensure you are in agreement with the competencies required.

So what should a good job description look like? It should include the following:

1 A brief description of your business
   - Provide an outline of your company, does it have offices interstate, what business are you in, who are your clients?

2 A description of the role
   - Provide information regarding the role, who does it report to, are there any direct reports?
   - What are the must have competencies and the nice to have competencies?
   - This will require you to really think through the absolute musts. Does the position require a tertiary qualification or is this just nice to have?
   - Describe the business’s culture and working environment; do you have an open office plan, flexible working hours?
   - Where is the role located, is there travel required?

3 Selection criteria
   - Outline the experience required in terms of time, industry. Is experience in your sector essential?
   - Is there a requirement for specific qualifications?
   - Personal attributes. These can be team player, good verbal and written communication skills, emotional intelligence and good time management.

4 Remuneration and benefits
   - What are the benefits you are offering in terms of remuneration, holidays, sick leave and study time?

5 Special requirements in your business
   These can be items such as regular health checks and mandatory drug testing.

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REPAIR, RECOVER & REFUEL.

The Melbourne Vixens netball team represent their home city in the elite Australia and NZ Championship competition. The Melbourne Vixens includes Australia’s best female athletes and a new generation of netball stars, with seven Australian squad members in the team, including recent World Champions Julie Prendergast, Bianca Chatfield and two-time Commonwealth Games gold medallist Sharelle McMahon.

Sports Dietitian Kerry Leech speaks with Sharelle McMahon, captain of the Melbourne Vixens Netball team.

Q. What is your favourite food?
I’m a little partial to chocolate but my favourite meal is chicken and vegetable risotto.

Q. Cereal or toast for breakfast?
Definitely a cereal girl, eating muesli, yogurt and milk helps me to keep going through the morning.

Q. Sharelle, you are working with Netball Victoria as well as playing and training with the Vixens - how do you fit it all in?
I’m very busy. I manage it with a very up to date diary!

Q. So how do you manage healthy meals on the run?
I need to be organised and pack food each morning. It makes drinks like Sustagen important as I can have them in the car on the way to or after training.

Q. What flavour Sustagen is your favourite?
That’s easy, Chocolate - I told you I am a chocolate girl!

Q. How do you feel Sustagen helps your recovery?
Netball is a hard game, I tend to come out of each game with a few bumps and bruises. Sustagen after each game helps to get the recovery process started and provides a great source of protein and carbohydrate.

Q. So what now for Sharelle McMahon?
The Vixens are finished for the season but the Australian team has international matches over the next few months against New Zealand and England. So plenty of training camps, travel and tough matches. No slowing down for me!

www.sustagensport.com
Interview with Juanita Claire Wilkinson
Cirque du soleil (performance medicine) physiotherapist

Sports Medicine Australia member, Juanita Claire Wilkinson takes us into her world of overseeing the health of performance medicine artists.

What is performance medicine?
It’s an area of medicine that encompasses dance, circus arts, exotic dancers, theater, singers, stunt performers and musicians.

Is this a relatively new area?
Dance medicine has been around for awhile, especially for ballet, but performance medicine has only become evident as a field on its own in the last few years.

Can you describe your role as a performance medicine physiotherapist? i.e. what does a typical day consist of?
A typical day would be treating in the clinic, attending performances/rehearsals and monitoring individual rehabilitation programs. Also collaborating with others involved; artistic directors, doctors, senior management etc when required.

Who are your clientele?
I treat a range of performing artists, both when I am on tour and in a private clinic when home in Sydney. They are singers, dancers, musicians and performing artists. Mostly I specialise in aerial artists, exotic dancers, stunt and physical performers.

“Contortionists tend to have more stability issues than others.”

Does treating this clientele differ in any way?
This group of people definitely requires different rehabilitation. Most of my Sydney based artists are teachers and performers, so injury can cause disruption to both aspects. It is therefore essential to have a good knowledge of apparatuses and know how to modify tricks/acts to minimise further injury.

What are some common medical issues performance medicine clientele have?
It is closely related to the type of apparatus or performance they do. For example trapeze artists have a high incident of shoulder problems as compared to trampolinitsts. Contortionists tend to have more stability issues than others.
Does the rehabilitation process for these injuries differ in comparison to injuries that might be seen in a community physiotherapist practice?

Most commonly it’s the stunt and aerial performers. Due to gravity acting in different and unpredictable ways this can impact on rehabilitation. For example, concussion on the football field is different to concussion with falling or spinning from height.

“...concussion on the football field is different to concussion with falling or spinning from height.”

What inspired you to become a physiotherapist?

I enjoy helping people and the fact that I can have a positive effect on someone’s wellbeing. Also spending so much time with physiotherapists during my sporting career (I competed in snow sports, particularly freestyle skiing) probably helped and the fact that I cannot do scalpel to skin so I was never going to be a surgeon!

How do these injuries usually occur?

Like sport it’s related to the balance between the frequency of training and performances and the rate of recovery. It is also the level of expertise with beginners more prone to injuries.

Are there some professions that sustain more injuries than others? Which professions? What are the reasons for this?

Singers are less likely to incur injuries compared to physical performers. Physical performers tend to have a moderate incident rate but not as high as stunt performers. Again skill level, number of performances, recovery and the ‘risk factor’ associated, i.e. risk factor relating to aerial verse ground verse the unknown which is mostly related to falling stunts; impacts on injury rates.

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Singers are less likely to incur injuries compared to physical performers. Physical performers tend to have a moderate incident rate but not as high as stunt performers. Again skill level, number of performances, recovery and the ‘risk factor’ associated, i.e. risk factor relating to aerial verse ground verse the unknown which is mostly related to falling stunts; impacts on injury rates.
How did you become involved in performance medicine?

By accident actually! Since I was 15 I had wanted to work in sports and be the Wallabies physio. I did become involved with rugby for many years but it wasn’t until a chance meeting with an athletic therapist working with an international performance group did I discover a passion for this type of rehabilitation. Then a few years ago the dream continued when I went on tour with Cirque Du Soleil. Since then I have worked with some pretty amazing athletes, artists and companies involved in performance in some way.

You work as a travelling physio. What are the particularly enjoyable and/or tedious aspects of the work?

Like any sporting or travelling physiotherapist’s job there are the good and bad, usually it has to do with continuous packing and unpacking, multiple visa applications and associated paperwork and long hours. On the up side you’re travelling and seeing new places. And the fact that I can fit my life into less than 60kg!

What are the challenges of working as a travelling physio?

Travelling constantly. I’m not whinging but it takes a lot out of you, and then your job is to be there for everybody; that can be a be challenge after 30 hours of flying. And, learning how to pack your life into a small number of bags.

Tell us your most interesting encounter while working as a performance medicine physiotherapist?

Traveling through South America and seeing everything they have to offer. Also being in the middle of the largest Brazilian brawl during a soccer match!
Rural sports doctor Gareth Thomas and researcher Professor Caroline Finch, through their study, look at how to meet the needs of both workplaces and local sport in the rural setting.

Whilst there have been several studies describing the demographic profiles and referral basis of patients attending metropolitan sports medicine clinics in Australia, there is very little data describing sports medicine services in rural and remote Australia. Nonetheless, both the Australasian College of Sports Physicians and Sports Doctors Australia have emphasised the lack of specialised sports medicine practices in rural and regional Australia.

Population level data describing musculoskeletal injuries in residents of both rural and metropolitan Australia has traditionally come from routine hospital data collections or small-scale general practice clinic studies. Anecdotally, sports medicine specialists treat a range of musculoskeletal conditions, including sports injuries and other musculoskeletal injury, especially those work-related.

The study

We wanted to describe the types of patients who attended a dedicated sports medicine practice in the Central West NSW rural city of Dubbo. The practice operates full-time as part of a larger clinic with 14 general practitioners, radiology, and physiotherapy services. It teaches medical students through the University of Sydney’s Dubbo Rural Medical and the John Flynn Program for rural medical students. Approximately 80 patients per week are referred by other health professionals, employers, or are self-referred. The single sports doctor (author Gareth Thomas) is also the Club Doctor for local rugby league/union teams, and has affiliations with gymnastics clubs, dance studios, and some of the region’s larger employers.

"Although the 2006 ABS census for the Dubbo region estimated that 10% of the population was Aboriginal/ Torres Strait Islander, they only account for 5% of the patients."
A full audit of the practice’s electronic patient records was undertaken over three months (1/07/2009–30/09/2009). Data extracted included: patient age, sex, self-reported Aboriginal/Torres Strait Islander (ATSI) status, injury context (sport/work/other), sport played at the time of injury, injured body region and specific diagnosis (coded to OSICS-10). The audit extracted information on 421 patients.

“Overall, 42% of patients had conditions/injuries that originated in workplaces (42%), compared to sport (35%).”

Although the 2006 ABS census for the Dubbo region estimated that 10% of the population was ATSI, they only account for 5% of the patients. Reasons for this could include a low level of self-identification as ATSI, having a lower injury rate or less tendency to seek medical attention at this sort of practice. There was a prevalence of male patients (59%), compared to official Dubbo population figures of 48% male. There was a significant association between age-group and context of sport/work injury; 36–65 year olds predominantly had workplace injuries and the less than 25 year olds mainly had sports injuries. Overall, 42% of patients had conditions/injuries that originated in workplaces (42%), compared to sport (35%).

There was also a significant association between the injured body region and injury context. Injuries involving the torso were more common in workplace patients than sport patients. Workplace conditions most commonly involved the upper limb (especially the shoulder) compared to sport injuries which were more common to the lower limb (especially the knee).

### Relationship between context of the injury or musculoskeletal condition and age group (n=421 patients)

<table>
<thead>
<tr>
<th>Age-group (years)</th>
<th>Workplace n (%)</th>
<th>Sport n (%)</th>
<th>Other n (%)</th>
<th>Total n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;16</td>
<td>1(1%)</td>
<td>33(22%)</td>
<td>13(14%)</td>
<td>47(11%)</td>
</tr>
<tr>
<td>16–25</td>
<td>26(15%)</td>
<td>50(34%)</td>
<td>6(6%)</td>
<td>82(20%)</td>
</tr>
<tr>
<td>26–35</td>
<td>31(17%)</td>
<td>21(14%)</td>
<td>8(8%)</td>
<td>60(14%)</td>
</tr>
<tr>
<td>36–45</td>
<td>49(28%)</td>
<td>22(15%)</td>
<td>13(14%)</td>
<td>84(20%)</td>
</tr>
<tr>
<td>46–55</td>
<td>42(24%)</td>
<td>11(8%)</td>
<td>16(17%)</td>
<td>69(16%)</td>
</tr>
<tr>
<td>56–65</td>
<td>23(13%)</td>
<td>6(4%)</td>
<td>19(20%)</td>
<td>48(11%)</td>
</tr>
<tr>
<td>&gt;65</td>
<td>5(2%)</td>
<td>5(3%)</td>
<td>21(21%)</td>
<td>31(8%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>177(100%)</strong></td>
<td><strong>148(100%)</strong></td>
<td><strong>96(100%)</strong></td>
<td><strong>421(100%)</strong></td>
</tr>
</tbody>
</table>

### Comparison of the distribution of affected/injured body regions in workplace (n=177) and sport (n=148) related cases

<table>
<thead>
<tr>
<th>Broad body region</th>
<th>Workplace n(%)</th>
<th>Sport n(%)</th>
<th>Total (workplace and sport combined) n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head and neck</td>
<td>7(4%)</td>
<td>2(1%)</td>
<td>9(3%)</td>
</tr>
<tr>
<td>Upper limb</td>
<td>86(49%)</td>
<td>32(22%)</td>
<td>118(36%)</td>
</tr>
<tr>
<td>Torso</td>
<td>29(16%)</td>
<td>14(10%)</td>
<td>43(13%)</td>
</tr>
<tr>
<td>Lower limb</td>
<td>48(27%)</td>
<td>97(65%)</td>
<td>145(45%)</td>
</tr>
<tr>
<td>Multiple/other</td>
<td>7(4%)</td>
<td>3(2%)</td>
<td>10(3%)</td>
</tr>
<tr>
<td><strong>Total n(%)</strong></td>
<td><strong>177(100%)</strong></td>
<td><strong>148(100%)</strong></td>
<td><strong>325(100%)</strong></td>
</tr>
</tbody>
</table>
“Rugby union, rugby league, athletics, netball, dance and soccer were the most common causes of sports injury.”

The most common workplace injuries were:
- Supraspinatus tendon injury (n=13)
- Lumbar muscle/tendon strain/injury (n=9)
- Elbow common extensor strain/injury (n=9)
- Carpal Tunnel Syndrome (n=8)
- Wrist sprain/jarring (n=6)
- Lumbar disc prolapsed (n=5)
- Superior labrum anterior-posterior SLAP lesion (n=5)

“With the large employers in Dubbo being mining and agriculture, and the largest private employer being an abattoir, these findings are not surprising.”

These indicate repetitive use as the likely cause in most patients, rather than acute injuries. With the large employers in the Dubbo district being mining and agriculture, and the largest private employer in Dubbo being an abattoir, with workers engaged in repetitive meat processing, these findings are not surprising.

The most common sports injuries were:
- Knee meniscal injury (n=14)
- Acute anterior cruciate ligament injury (n=8)
- Lateral ankle ligament sprain (n=7)
- Knee medial cruciate ligament injury (n=6)
- Anteroinferior instability of the shoulder (n=5)
- Sacroiliac joint injury (n=5)

These injuries are more likely to result from acute rather than repetitive trauma.

Rugby union (21%), rugby league (18%), athletics (9%), netball (7%), dance (5%) and soccer (5%) were the most common causes of sports injury*.

* Note: the distribution of sports leading to injury in this study is limited by the fact that it covered a purposely-chosen busy sports medicine practice period over the end of a winter’s sports season and so deliberately includes the football and netball season but excludes popular summer sports such as cricket and other active pursuits.

“The city of Dubbo has had no resident Orthopaedic Surgeon for some time, no Occupational or Sports Physicians and no Sports Physiotherapist.”

Summary
This is the first study to describe sports medicine clinic patients with musculoskeletal conditions in rural Australia and shows that the injury diagnoses and body regions are generally consistent with those reported for other sports injury treatment settings.

To our knowledge, this is also the first study to provide specific details about workplace musculoskeletal conditions that are treated in a sports medicine practice. This highlights the need for clinical sports medicine services in rural communities to provide appropriate treatment and management of patients with these conditions.

The city of Dubbo has had no resident Orthopaedic Surgeon for some time, no Occupational or Sports Physicians and no Sports Physiotherapist. The arrival of Gareth Thomas in Dubbo in December 2007 has allowed assessment and treatment of workplace musculoskeletal injuries using sports medicine principles, with major employers in the district referring preferentially to the practice. This has addressed a previously unmet need, thus leading to the large proportion of employer-driven referrals to the practice. Conversely, sporting organisations have long been using emergency and orthopaedic services at Dubbo Base Hospital, which provides fly-in fly-out orthopaedic surgeons and registrar. These services have the advantage of being free, and well established. With the local sporting population being non-professional, cost of services may be as much a factor in attendance as waiting times and perceived expertise. These factors may explain the referral sources and contexts of the injuries in the patients treated at the clinic.

Gareth Thomas
Western Plains Medical Centre, Wheelers Lane, Dubbo, NSW

Caroline Finch
Australian Centre for Research into Injury in Sport and Its Prevention (ACRISP), Monash Injury Research Institute, Monash University, VIC

References, as indicated within the article, are available at sma.org.au/publications/sport-health/

Are you a sports medicine professional who works in a rural setting? If so, Sport Health would love to hear about your experience to feature within an upcoming issue. Email the Editor, Amanda Boshier on amanda.boshier@sma.org.au
Shoulder pain in wheelchair athletes

Australian Paralympic Committee Physiotherapist Keren Faulkner FACP writes about the considerations and challenges faced when dealing with shoulder pain in wheelchair athletes.

The Australian Paralympic Committee supports high-performance athletes competing in wheelchair rugby, tennis, basketball, track racing, table tennis and shooting as well as other wheelchair users who compete in non-wheelchair events such as equestrian, hand cycling, swimming and powerlifting. Incidence rates of shoulder pain as high as 70% have been reported compared with 40% in able athletes. High loads are placed through the shoulder during wheelchair activities of daily living (ADLs) and sport and this load is intense and distributed bilaterally during sport wheelchair propulsion and control. Female wheelchair users are more at risk of shoulder pain than males, as are individuals with a high BMI.

“Incidence rates of shoulder pain as high as 70% have been reported compared with 40% in able athletes.”

There is an increased risk in the first six months post-spinal cord injury (SCI), as new techniques for transfer and mobility place increased load through the upper limb. A higher level of SCI increases the occurrence of shoulder pain considerably and there are many reasons for this, which will be discussed further.

With greater duration of wheelchair use and sport chair usage, there is greater risk of compromise to the shoulder. Athletes report a higher frequency of shoulder pain than non-athletic wheelchair users.

“Treating the cervical spine is not sufficient – the posture and environmental load needs to change to unload structures which are constantly under pressure.”

Wheelchair athletes perform closed-chain upper limb transfers for moving in and out of the chair as well as for relief of ischial pressure. Thoraco-humeral muscles allow this action to occur with minimal weightbearing force crossing the glenohumeral joint; however, strength and endurance of these muscles may be compromised prior to sport-specific training. Pushing a manual wheelchair requires a vertically oriented force to be applied to the wheel, although this is entirely different for quadriplegics without triceps function who pull upwards using biceps. Fast movements, changes in direction and uphill propulsion require significantly higher forces and research has shown fatigue to be marked in supraspinatus and pectoralis major.
In addition to these requirements for transfers and propulsion, athletes competing in sports such as tennis and basketball have significant sporting demand in an overhead position. The rotator cuff has a major role during all of these activities for either stabilising the glenohumeral joint or creating rotational movement. Fatigue has a huge impact on its ability to function. It is important to remember that a wheelchair athlete may have fatigued muscles before they even start their match.

“The primary challenge to the physiotherapist is not to find the diagnosis but to address the contributing factors while respecting the constraints of the sporting and everyday environment.”

Pathogenesis of shoulder pain is multifactorial in wheelchair athletes and include rotator cuff and isolated supraspinatus tendinopathy, subacromial impingement and bursitis, biceps tendinopathy, glenohumeral instability, AC joint pathology, distal clavicle osteolysis, cervical spine referral and glenohumeral OA. Pathologies occur simultaneously as a result of repetitive forces associated with long-term wheelchair use. A recent study of elite wheelchair tennis highlighted an increased incidence of degenerative, symptomatic acromioclavicular degeneration. The primary challenge to the physiotherapist is not to find the diagnosis but to address the contributing factors while respecting the constraints of the sporting and everyday environment. Surgical options will be considered much later in injury progression for wheelchair-dependent athletes, given the significant impact that surgical recovery would have upon ADLs. The need for precise, thorough rehabilitation could not be more important.

“With greater duration of wheelchair use and sport chair usage, there is greater risk of compromise to the shoulder.”

Environmental factors are considerable for the wheelchair athlete. Sitting position in the chair is highly relevant and there are often different goals for a day wheelchair compared with a sporting one. Thoracic flexion will compromise neurogenic structures of the cervicothoracic and thoracic outlet region. The thoracic posture is utilised by wheelchair athletes to increase sitting stability and therefore aid function. Amputees or athletes with a lower SCI can optimise stability through active trunk control; this allows a higher sitting position with more neutral thoracic posture. While utilising more trunk and pelvic control in wheelchair sport, amputee athletes are at an increased risk from a relative lack of wheelchair use and skills at daily level as they are usually ambulant during the day, using a chair only for sport. High-level SCI athletes need to sit lower and in moderate kyphosis to achieve stability that in turn can compromise scapulothoracic and glenohumeral function.

“...amputee athletes are at an increased risk from a relative lack of wheelchair use and skills at daily level...”

For closed-chain wheelchair propulsion, the rotator cuff requires excellent thoraco-scapular stability to enable it to work effectively from a stable base. Initially, rehabilitation should be directed towards rhomboids, trapezius and serratus anterior before progressing to rotator cuff. Posterior deltoid should not be ignored. There is often a strength bias towards anterior deltoid secondary to posture. Strengthening posterior deltoid and stretching pecs can be beneficial in assisting centralisation of the humeral head within the glenoid. Subacromial impingement and rotator cuff tendinopathy make up the most frequent diagnoses for wheelchair athletes with...
shoulder pain. Muscle imbalance can contribute, in particular a loss of the ability of lower rotator cuff to stabilise the head of humerus as the anterior deltoid elevates during transfers and arm elevation. In some cases, muscle balance is not possible due to innervation; however, it is always possible to aim for improvements in posture, movement awareness, proprioception and joint alignment. The flexed seated position poses a challenge to the physiotherapist and it is worth paying careful consideration to the abilities of the individual. Specifically, can the athlete retract the scapula via trapezius and rhomboids (C5)? Is there range available through pecs? Are there thoraco-humeral muscles available for weightbearing transfers such as lat dorsi (C6,7,8) pec major (C7, 8, T1) and serratus anterior (C5,6,7)?

"The flexed seated position poses a challenge to the physiotherapist and it is worth paying careful consideration to the abilities of the individual."

Wheelchair propulsion is a dynamic closed-chain exercise and requires stability throughout the kinetic chain. Sitting balance is a key along with thoraco-lumbar strength and mobility. Consider the wheelchair user’s shoulder injury with a similar approach to the throwing shoulder. Address the stability of the base, in this case the pelvis/sitting position, and pay careful attention to any deficits in the chain – spinal, scapular, shoulder, elbow or wrist and hand.

In consideration of neurodynamics, posture is important. Many wheelchair users sit in a posture that compromises the space available through the thoracic outlet. When this is combined with cervical protraction and extension required to look upwards in a world designed for the 180cm person, it is not surprising that altered neural sensitivity is often (or always) a factor in shoulder pain. Treating the cervical spine is not sufficient – the posture and environmental load needs to change to unload structures which are constantly under pressure.

In managing the wheelchair athlete with shoulder pain, the considerations are many and the challenges are significant. Successful physiotherapy treatment will be thorough and precise and will consider all aspects of everyday life as well as the sporting demands.

Keren Faulkner FACP
Keren is a Specialist Sports Physiotherapist and an Australian Paralympic Committee Physiotherapist.

References are available at sma.org.au/publications/sport-health
The professional challenge of medicine on the move

Australasian College of Sports Physicians (ACSP) President, Dr David Hughes highlights the essential physician competencies for team travel.

There have been times in my career when I have thought to myself that I am ‘over’ travelling with sporting teams. Unappealing facets of team travel include time spent in transit (particularly in overcrowded and inefficient airports), disruption to home and work life, financial penalty (depending on the professional status of the team you are working with), at times a claustrophobic ‘team cocoon’ environment and the inevitable ‘Groundhog Day’ syndrome of repetitive bus rides to training, team meetings, hotel buffet meals, treatment sessions etc.

Yet as I write, I find myself in central China with a team of athletes (the Australian Opals), some of whom are not much older than my eldest daughter. Surprisingly, I am energised and enthused by the experience.

If team travel is to be a positive experience, having a harmonious management team is essential. I consider myself very fortunate that the Opals have a manager, physiotherapist and coaching staff who are highly professional, respect each other’s roles, pitch in to help each other as required and have the ability to switch off and relax when the opportunity presents itself.

“...the medical expert needs to be a competent communicator, collaborator, manager, health advocate, scholar and professional...”

On a professional level, travelling with a team to locations where access to familiar medical services is limited uniquely challenges the medical expertise of the Sport and Exercise Medicine (SEM) Physician. When travelling with a team, the physician is required to call upon all of those essential abilities that are part of the CanMEDS Framework, begun in the 1990’s by the Royal College of Physicians and Surgeons of Canada (http://rcpsc.medical.org/canmeds/). For those unfamiliar with CanMEDS, it is a comprehensive definition of the essential physician competencies for medical education and practice. CanMEDS states that the medical expert needs to be a competent communicator, collaborator, manager, health advocate, scholar and professional (Diagram 1).

“If team travel is to be a positive experience, having a harmonious management team is essential.”

The ACSP advanced training program, assessment process and Maintenance of Professional Standards (MOPS) program are very much grounded on CanMEDS competencies. I consider myself privileged to have had the opportunity to complete the ACSP Fellowship training program to qualify as an SEM Physician. The training program is recognised around the world as the gold standard in specialist training of sport and exercise medicine. It equipped me with a foundation skill set which is ideally suited to the various demands of team travel, notwithstanding the subsequent requirement for team travel experience, to appropriately develop what one could describe as team physician expertise.
Communicator

“...it is critical that there are healthy and respectful communication channels...”

As in all areas of medical practice, communication is critical in the team travel environment. In all elite sport, there are certain pressures that come to bear and those pressures affect different members of the travelling team in different ways. Players are under pressure to perform. Coaches are under pressure to deliver results. Medical staff are under pressure to allow the players to perform on the court unimpeded by illness or injury.

Collaborator

Collaboration between the medical staff during a sporting tour is essential to deliver optimal healthcare to the players. There is no room for runaway egos on tour. The team physician who believes they are the repository of all medical wisdom is a curse to the touring sports team. One would hope to be a competent and confident team physician. I am yet to travel with a team however and not learn at least one or two clinical gems from my physiotherapist colleagues. Over the past couple of years with the Opals I have had the benefit of working with Rachel McAlister and Graeme Backen, two highly professional and hard-working physiotherapists. All three of us have improved our medical knowledge from free interchange of ideas and approaches to assessment and management of the athlete. The collaborative medical environment benefits the athlete, the physiotherapist and the physician.

“There is no room for runaway egos on tour. The team physician who believes they are the repository of all medical wisdom is a curse to the touring sports team.”
Team care is as much about preventive health advocacy as it is about treating illness and injury. Preventive strategies minimise potential for illness and injury. As a health advocate, the team physician needs to educate athletes, coaching staff and management regarding the rationale for prevention and recovery strategies. This health advocacy role should begin well before commencement of the tour. When travelling abroad, sporting teams must be informed about potential health risks associated with long haul travel, injuries specific to the sport and infectious disease risks relevant to the destination. As with all doctor-patient interactions, athletes are more likely to follow advice if they have a clear understanding of the reasons and evidence underpinning that advice.

“A physician who does not preserve habits to improve skills and knowledge is almost certainly de-skilling.”

Use of online journals and other medical information resources does not stop at the airport. The team physician should maintain scholarly pursuits, despite being on the move. A physician who does not preserve habits to improve skills and knowledge is almost certainly de-skilling. In my current tour of China with the Opals, I have taken the opportunity while travelling to listen to the dulcet tones of Dr Karim Khan on podcasts downloaded (to my iPhone) from the British Journal of Sports Medicine.

I have been online most days in relation to medical aspects of team or individual athlete care. Travel medicine recommendations regarding specific destinations are constantly in a state of flux and a pre-travel update is essential. I try to utilise the tour ‘downtime’ (during player-coach meetings, athlete rest time etc) as an opportunity to catch up on educational reading. Access to online journals provides an excellent opportunity to have a mini ‘Journal Club’ with the team physiotherapist, discussing interesting recent papers.

“The danger for the team physician is that one can fall into the trap of trying to be a ‘friend’ to the athlete rather than being their health professional.”

The issue of medical ethics and professional behaviour is particularly pertinent for the team physician. In the ‘normal’ situation of day to day physicianly practice, the physician does not see his or her patients at breakfast, lunch and dinner.
They do not travel on buses with them or share team jokes. The danger for the team physician is that one can fall into the trap of trying to be a ‘friend’ to the athlete rather than being their health professional. While it is desirable to have a convivial relationship with the athlete, the team physician must never lose sight of the fact that the foundation of the relationship at all times remains a professional doctor-patient relationship with all the inherent assumptions regarding confidentiality and privacy. If an athlete approaches me on tour to discuss a medical issue, I attempt to the best of my ability, to reproduce the normal consulting room environment. I do not conduct consultations in front of other athletes and I try to ensure complete privacy while the medical conversation takes place. It is a frequent occurrence in my experience for an athlete to approach the team physician about a ‘garden variety’ musculoskeletal issue as a segue into discussing issues of a more personal or private nature which the athlete may not want to discuss in front of other people. The team physician should not fall into the habit of conducting consultations in the treatment room, in the presence of other athletes.

Sporting tours will often provide some opportunity for social activities such as sight-seeing or a team meal at a restaurant. The team physician must remain aware on these social occasions of the primacy of their role as a health professional. On tour, the physician is effectively on duty at all times. Medical issues can arise at any time of day or night and the physician can not risk being affected by alcohol. The respectful boundary between doctor and patient must not become blurred or less defined on such social occasions.

It is essential that a team physician has a good understanding of the rules and physiological demands of the relevant sport. A team physician who is a ‘fan’ however, is a danger to the athlete and has no place in the team environment. The ‘fan’ should remain in the grandstand and not be professionally involved with the athlete. Regarding the athlete with a sense of ‘awe and wonder’ in response to their athletic prowess is likely to effect the physician’s professional judgement.

“I find that the real cultural difference is found not so much in the humanistic qualities of the people but rather the logistical factors such as language, environment, food, transport and weather.”

One significant benefit of travelling is of course cultural interchange. Mark Twain said “Travel is fatal to prejudice, bigotry and narrow-mindedness”. The impression one has of China via Western media is different to the reality one witnesses when dealing with individuals on the street, in shopping centres and at sporting venues. The Chinese people have been almost universally courteous, friendly and helpful. As with all other cultures that I have had the privilege of experiencing, the people are normal folk who want the opportunity to improve their lot in a pleasant and peaceful environment. I find that the real cultural difference is found not so much in the humanistic qualities of the people but rather the logistical factors such as language, environment, food, transport and weather.

Team travel provides the opportunity for the SEM Physician to practice medicine in a challenging and stimulating environment. The relationship with the patient is unique due to the closeness and frequency of physician-athlete interaction. The principles which underpin the professional practice of medicine and the competencies which define the medical expert however, apply equally within the team and office environments.

Dr David Hughes
Sport & Exercise Medicine Physician
President, Australasian College of Sports Physicians

SPORTS INJURY FACT SHEETS

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

For more information or for an order form visit http://sma.org.au
**The Australasian Academy of Podiatric Sports Medicine (AAPSM)**

**News:**
- The AAPSM Board continues to be busy in preparation for the Australian Conference of Science and Medicine in Sport (October 19–22) in Fremantle. Our keynote speaker, Dr Richard Bouche DPM will deliver the latest knowledge and management of lower limb pathologies relating to sports medicine.
- A lot of effort (and finances) are going into the new website for AAPSM. It will be launched within the next couple of months.
- The AAPSM Board is also moving, albeit slowly, towards setting up the new Fellowship program. Discussions are still underway with the other Special Interest Groups and the Podiatry Board of Australia. More information will hopefully be available at the AGM in Fremantle.

**Upcoming events:**
- Please refer to the individual State Association Continuing Professional Education Programs.

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

**Australasian College of Sports Physicians (ACSP)**

**Upcoming events:**
- 28th ACSP Annual Scientific Conference
  November 13–16, 2011
  Hyatt Coolum, QLD
- ACSP Clinical Sports Medicine 2012: Upper Limb
  March 4, 2012
  Sydney, NSW

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

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

**News:**
- The CoSEP is preparing for their annual AGM and primary CPD event for 2011 – both of which will be held at the APS Annual Conference in Canberra from October 4–8, 2011. Ongoing events, including peer consultation and professional development presentations are being organised by the State Sections across a range of states.

For further information visit [www.groups.psychology.org.au/csep/](http://www.groups.psychology.org.au/csep/)

**Upcoming events:**

**Australia**
- CoSEP National and State Section CPD events
- CoSEP Themed Day – APS Annual Conference 2011
  October 4–8, 2011, Canberra (October 7 TBC)
- CoSEP AGM – APS Annual Conference 2011
  October 4–8, 2011 (October 7 TBC)
- Career Counselling, Coaching and Assessment Workshop by Dr Jim Bright FAPS
  September 14–16, 2011, Sydney (CoSEP Endorsed Activity)

**Overseas**
- AASP Annual Conference 2011
  September 20–24, 2011, Honolulu, Hawaii, USA
  [http://appliedsportpsych.org/conference](http://appliedsportpsych.org/conference)
- BASES Annual Conference 2011
  September 2011, Essex, UK
- 6th ASPASP International Congress 2011
  November 11–14, 2011, Taipei, Taiwan

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

News:
- The 2011 SDA Conference will be held in Melbourne on October 15, 2011. Themed Fuel for results – the science of successful sports nutrition, the Conference offers delegates a variety of topics covering the themes of supplementation; the science of sports nutrition; and nutrition for specific sports. Keynote speakers are Professor Louise Burke and Professor David Pyne of the AIS and Professor Mark Hargreaves of the Department of Physiology, University of Melbourne. Abstract and poster submissions are also welcome.
- In conjunction with the Conference, SDA is hosting a free public lecture on October 14, 2011 at Federation Square, Sports nutrition – guesswork to expertise, covering the journey of sports nutrition, how Australia has led the way and its significance to active Australians, presented by Glenn Cardwell.

For further details visit

Upcoming events:
- Nutrition for Exercise & Sport Courses:
  - Tasmania – August 13, 2011
  - Victoria – August 20, 2011
  - New South Wales – August 27, 2011
  - Western Australia – September 10, 2011
  - Queensland – October 22, 2011
- Nutrition for Exercise & Sport for the Junior Athlete Course:
  - Queensland (Brisbane) – August 20, 2011

For more information visit www.sportsdietitians.com.au

Sports Doctors Australia (SDrA)

News:
- The SDrA AGM will be held at ACSMS where several committee positions will become available. We encourage motivated doctors with a passion for sports medicine to nominate for these positions (those interested email tamara.christmas@sma.org.au).
- One of the many benefits of SDrA membership is free membership of FIMS, so for those interested in joining contact tamara.christmas@sma.org.au. Please note for those who are members or Fellows of SDrA we have negotiated your ongoing membership of FIMS so please disregard any renewal notices you may receive.

For more information visit www.sportsdoctors.com.au

Sports Physiotherapy Australia (SPA)

News:
- SPA and the Board of APA continue to advocate for direct referral to Sports and Exercise Physicians. We are aware that many members have arrangements to get around the new situation, but recognition of the important relationship between Sports Physiotherapists and Sports Physicians will be an ongoing issue.
- The training program for Sports Physiotherapists to become Specialist members and Fellows of the Australian College of Physiotherapy has commenced with six SPA members now undertaking the program. These members are working towards examinations in April 2013. This is an exciting step in the development of a career pathway for Sports Physiotherapists.

Upcoming events:
- APA Physiotherapy Conference 2011
  Brisbane Convention & Exhibition Centre
  October 27–30, 2011

For more information visit www.physiotherapy.asn.au
The Journal of Science and Medicine in Sport

The Journal of Science and Medicine in Sport (JSAMS), 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.

## News

JSAMS has recently received an Impact Factor of 2.542 which has increased from 1.57, and a five year Impact Factor of 2.694 which has also increased from 2.283. JSAMS is now ranked 10th of a total 79 journals in the category of Sport and Exercise Science and Medicine. This is a great achievement and thanks goes to Journal Editor, Professor Greg Kolt, and the Elsevier team which compiles the Journal.

What does Impact Factor mean?

The Impact Factor is an important, albeit retrospective, indicator of a journal’s quality. It is a measure of the number of current citations to articles published in a specific journal in a two year period divided by the total number of articles published in the same journal in the corresponding two year period. Impact Factors are usually published in mid-June (i.e. it takes about six months for the calculations and checks to be made). Citation behaviours and Impact Factors vary markedly between disciplines but it is valid to compare those for journals in the same field and to note trends over time. To assist this process Journal Citation Reports categorise journals in a number of fields within which they can then be ranked by Impact Factor.

## 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.

## Top 20 Sport and Exercise Science and Medicine journals

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<tr>
<th>Rank</th>
<th>Abbreviated journal title (linked to journal information)</th>
<th>ISSN</th>
<th>Total cities</th>
<th>Impact Factor</th>
<th>5-year Impact Factor</th>
<th>Immediacy Index</th>
<th>Articles</th>
<th>Cited half-life</th>
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