

Sport Health



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Publisher

Sports Medicine Australia
PO Box 78 Mitchell ACT 2911
Tel: (02) 6241 9344
Fax: (02) 6241 1611
Email: smanat@sma.org.au
Web: www.sma.org.au

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Editors

John Orchard & Janelle Gifford

Managing Editor

Lesley Crompton

Chief Executive Officer

Gary Moorhead

Subscription Manager

Ken Warwick

Advertising Manager

Lesley Crompton

Design/Typesetting

Whalen Image Solutions

SMA STATE BRANCHES

ACT

ACT Sports House, 100 Maitland St Hackett ACT 2602
Tel: (02) 6247 5115

New South Wales

PO Box 3176 Rhodes NSW 2138
Tel: (02) 8116 9815

Northern Territory

PO Box 2331, Darwin NT 0801
Tel: (08) 8981 5362

Queensland

Sports House, 150 Caxton St, Milton QLD 4064
Tel: (07) 3367 2700

South Australia

PO Box 219, Brooklyn Park SA 5025
Tel: (08) 8234 6369

Victoria and Tasmania

Sports House, 375 Albert Rd, South Melbourne VIC 3205
Tel: (03) 9674 8777

Western Australia

PO Box 57, Claremont WA 6010
Tel: (08) 9285 8033

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For subscriptions contact Ken Warwick

Phone: (02) 6241 9344

Email: smanat@sma.org.au

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Cover photograph: Photos.com

Doing the Right Thing

By Gary Moorhead

At some stages in most people's lives, choices have to be made between actions that will provide material benefit and "the right thing" – which might be something completely different. A complicating factor is that sometimes the distinction can be blurred. For example, it's a fine line between minimising your taxable income and outright cheating on your taxes.

In the provision of health services, there often exist situations where a profession actively promotes policies and practices that in the long run have the potential to "hurt business." But they do it anyway because it is "the right thing". Dentists promoting fluoridation of water supplies is one obvious example. Health professionals involved in the treatment of sporting injuries promoting injury prevention is another. Sports Medicine Australia (SMA) members fit squarely into this latter category, with the added "right thing" of also advocating sport and physical activity for their health promoting/disease preventing qualities. (For an absolute belting of another group with possibly different approaches here, read Dr J in this same issue of Sport Health.)

Sports Medicine Australia and SMA members have always been at the forefront of campaigns and policies aimed at reducing the incidence and severity of injury in sport and recreational physical activity. The Safer Sport Program – the Program through which SMA members turn community volunteers into Sports Trainers by teaching them sports first aid and injury prevention and thereby providing sport in Australia with a unique safety infrastructure – turns 25 this year. (It should also be acknowledged that this Program has always had some level of government support at either state or federal level and has had 25 years of unbroken support from medical supplies company Beiersdorf.) At the moment

there are more than 15,000 community volunteers working in sport with current SMA Sports Trainer accreditation. As a volunteer program there is a high level of attrition and a constant need to train more Trainers. In the last 12 months, SMA branches put a record number of people through courses (more than five and a half thousand).

While "doing the right thing" and teaching and promoting sports injury prevention is no doubt reducing the number of potential injuries, there is a positive quid quo pro in the process for SMA members. A basic ethos of sports medicine is the "team approach" to treatment, with all relevant professions making a contribution from their area of expertise. Sports Trainers have always been embraced as part of the sports medicine team - the "team behind the team". This has one direct benefit to SMA members in that Sports Trainers provide a reliable referral stream of injured players under their care. Anecdotally, many physiotherapy practices have been built from service with local sporting clubs to teach skills to the club Sports Trainers that led to a later referral stream for the physio.

Sports Medicine Australia has also supported sport in Australia by the provision of expert advice, policies and guidelines for safety. These policies and guidelines are constantly updated to take into account the latest research and best practice. This year SMA has released updated guidelines for preventing injury in hot weather and revised comprehensive "Safety Guidelines for Children in Sport. (download at <http://www.sma.org.au/information/resources.asp>) In addition, with assistance provided by a grant from the Commonwealth Department of Health and Ageing, SMA has been able to extend the community sports safety program "Smartplay" nationally. This means Smartplay resources will be able

to sporting organisations, schools and individuals in all parts of Australia. (To download or view the complete resource list see <http://www.smartplay.com.au>).

So what impact have we had? The struggle to provide an accurate answer to this question is one of the prime motivators behind a renewed "do the right thing" campaign by Sports Medicine Australia to raise the quality of sports injury prevention in Australia.

There are many anomalous aspects to sports injury that impact adversely on developing a national all-encompassing approach to prevention. In terms of allocating responsibility at a government level, recognition of sports injury as an issue has suffered because while the incidents and events that cause the injuries largely lie under one department (Sport) the costs that are an outcome of the injuries lie under another (Health). In fact, in recent years this situation has received some recognition with all support for sports injury prevention at a national level in Australia coming from the Department of Health and Ageing. In a number of state jurisdictions, most notably Victoria, there seems to be a greater level of sharing responsibility between health and sport departments and departments of sport and recreation. In the wider area of recreational physical activity and health promotion through physical activity, for many years, injury consequent of this activity was very much an "elephant in the room" – don't mention it because it might embarrass or upset. The most extreme manifestation of this attitude was a "promoting injury prevention will put people off activity" viewpoint. Fortunately, in this country at least, there seems to have been a breaking down of the barriers between physical activity promotion and injury prevention and recognition by promoters of both that the two are closely linked. SMA can take some credit for this by our promotion of injury prevention and

physical activity conferences concurrent with the SMA national conference.

But failure to recognise the significance or potential danger of sports injury is no respecter of background. Despite the plethora of research articles in injury citing the peak danger times for injury as being when one is beginning or recommencing training for a sport or returning from injury, or when one over-trains and overdoes it, there have been a number of instances where this message does not seem to have got home with prominent members of SMA. In recent months we have had the following mishaps:

- A former national office holder with 20 years in elite sport deciding to prepare an aging body for overseas trekking by embarking of a daily exercise program. Only problem, as a busy man, he couldn't manage daily so decided to cram the whole program into two sessions a week. Result? Stress fractures in both feet!
- A senior manager with direct responsibility for injury prevention programs decides to take up touch football in his forties. Result? Snapped Achilles in his first game!
- A long standing sponsor has a surge of youthful adrenalin and decides to return to soccer after a 10 year lay-off. Result? ACL!

The point of these sadly amusing anecdotes is that they underscore the importance of getting a balanced level of injury prevention information into all programs promoting sport and physical activity – most particularly those targeting an older population. There is no doubt that the baby-boomers will increasingly embrace returns to sport and activity as they try and stave off the effect of ageing. If we don't "do the right thing" and make sure they are forewarned about the dangers and forearmed with the right information, sports medicine practitioners – and the health system – will be choked with crocked oldies. (And yes, I have fallen off my bike twice since returning to cycling after a 30 year lay-off!)

For the new SMA injury prevention campaign, the initial focus will be on the publication of a "Consensus Statement about Sports Injury Surveillance and Prevention in Australia." (see following)

The Statement will attempt to gather wide support from health and sport sector organisations for its proposals. To date, these include:

- A national system for monitoring and preventing sports injury.
- The establishment of a federally-funded body (resourced by both Departments of Sport and Health) to undertake this surveillance and prevention task. The rationale for federal funding (apart from the fact that it needs to be a national body) is that the Federal Government bears the bulk of sports injury costs through Medicare, private health insurance rebates and hospital subsidies to state governments.
- Initial establishment of programs to:
- Expand the Australian Spinal Cord Injury Register to include a specific section on sports injury based on the New Zealand model.
- Create a national knee Anterior Cruciate Ligament (ACL) register based on the Norwegian model.
- Promote increased mouthguard use.
- Compile de-identified injury data from insurers and hospitals.

While there may be some debate about the choice of these specific programs as the lead-off priorities for the Campaign, there are strong arguments in their favour. Without data collection and measurement, we will have no idea of what is working and what is not. Without adequate resourcing and data collection powers, a similar negative outcome is likely. Promoting increased mouthguard use will bring in strong partnership support from the Australian Dental Association and mouthguards are an injury prevention device with a proven track record of success. As with all safety equipment, there are arguments mounted against mandating their use because of the potentially negative effects on costs of participation and participation numbers per se. Seat belts added to the cost of cars and were seen as an attack on civil liberties when their installation and use was first made mandatory. The next edition of Sport Health will contain a detailed expansion on the Consensus Statement and argument for the other proposals.

Two of the prime movers of this campaign are National Board member

Dr John Orchard and Journal of Science and Medicine in Sport (JSAMS) editor, Professor Caroline Finch. Dr Orchard, a Sydney-based Sports Physician with a background of practice with both elite Australian Rules and Rugby League football has a long history of working with injury prevention campaigns. For many years he has been one of the authors of the injury report for both the AFL (see elsewhere in this issue) and Cricket Australia and he also maintains the legendary www.injuryupdate.com.au website. Professor Finch is one of the world's leading sports injury epidemiologists and probably has a million frequent flyer points earned by attending conferences as a major speaker on sports injury. There are two reports on sports injury prevention elsewhere in this edition by Professor Finch.

If anyone is interested in contributing to the campaign, they should make email contact with the author.

Gary Moorhead is the Chief Executive Officer of Sports Medicine Australia.

gary.moorhead@sma.org.au

Discipline Group News

Australian Physiotherapy Association - Sports

Coming up...
Orthopaedic Physiotherapy
Joint Relations 2008
22nd August 2008
Bond University, Gold Coast
Ph: (07) 3423 1553

National APA Aquatic Physiotherapy Symposium

Current Practice – Future Direction
30-31 August 2008
Royal Perth Hospital
Ph: Karen Guy (08) 9389 9211

Australian college of Sports Physicians

3rd Football Australasia Conference
23-25 October 2008
Telstra Dome, Melbourne
Ph: 1300 799 691

Will the AMA ever embrace sports and exercise medicine?

Dr J

One of the internal sayings of the AMA (Australian Medical Association) is apparently that “all doctors are members of the AMA – it’s just that some choose to pay their membership fees and others don’t.” What they mean by this is that the AMA is the representative body for all doctors and they will work for you whether you are a paid up member or not. Unfortunately this is only half of the truth. It’s true that whether you have paid your membership dues is irrelevant. The false bit is that they represent all doctors. Unfortunately there is a time-honoured hierarchy at the AMA, with surgeons and other proceduralists at the top, followed by non-procedural specialists with GPs a long way down the food chain. Sports physicians rank right down the bottom at the AMA, along with doctors who trained overseas. The AMA will defend to the death the right of surgeons to generate Medicare rebates for procedures that have been shown not to work, or, alternatively, the right of a surgeon who has been successfully sued dozens of times not to pay an increased liability premium. However, if you are a sports physician trying to get the advanced four year training program that you completed a decade ago recognised by Medicare, then the AMA will brush you off as a non-concern, whether you are a member or not.

For balance, I should declare my personal history with the AMA. I joined the AMA as a medical student in the 1980s and was a member for my first ten years as a doctor, resigning in 2000, shortly after the Sydney Olympics. I believed in the 1990s, as many sports physicians still do, that the only way to properly effect change is from within. By being a member you can vote and make internal representations. It is almost a truism that the AMA should listen to their own members more than they should listen to outsiders. Why then did I resign? The straw that broke

the camel’s back for me was a dinner that they were holding in Sydney for members to celebrate the Olympics. I had replied to an invitation for the dinner, well before the RSVP date. The week before the dinner I arrived home to find a voice mail message on my answering machine from the AMA, which said words to the effect of “too many doctors have RSVP’d to the dinner function, so we are sorry to tell you that you can no longer attend”. That got me thinking, if they are prepared to give me the rubber glove treatment as an individual member without being in the slightest bit concerned about it, is it possible that I am sitting by idly while they do it on a larger scale to the entire specialty of sports medicine? The dinner was to celebrate the Olympics and as a sports physician I was being de-invited because I obviously was on their list of “less important” members. I would have bet my house that they weren’t calling up surgeons to tell them not to attend the dinner. If they couldn’t value a sports physician as an important member to look after at a dinner function celebrating sport and medicine, when would they ever value me as a member?

I wrote the AMA a letter. I explained that I had been a member for my entire medical career and that I believed that, all other things being equal, that I *should* be a member of the AMA. I briefly mentioned my annoyance at being snubbed at the dinner but then cut to the chase. I stated that far and away my biggest personal issue in medical politics was that the Federal government did not properly recognise my area of specialty, which was sports medicine. Many in my profession had believed that the Sydney Olympics would be the watershed moment when it would become glaringly obvious to the government that sports and exercise medicine must be considered an important specialty in this country. It looked as if this wasn’t

going to happen. The question was: did my own representative organisation, the AMA, actually support the recognition of sports medicine as a specialty? The answer was, sadly, in a word “no”. To add insult, they had the audacity to write, “the AMA supports all doctors, not only just those in recognised specialties, but also doctors like yourself who *haven’t* undertaken any recognised training”. In other words, their opinion (in the year 2000) is that my training meant jack and that I may as well have cut out my Fellowship of the ACSP off the back of a cornflakes packet. They didn’t recognise it and they didn’t care to inquire whether it was even worth recognising. However they still pointed out that they wanted to represent me as a “doctor-without-any-training”. I of course took the only dignified course of action and resigned, vowing to never again consider membership until the AMA fully recognised my training.

Paradoxically, I have maintained a very good relationship with their flagship journal, the *Medical Journal of Australia*. Fortunately the MJA appears to have complete editorial independence (as all good peer review journals do) and has published many sports and exercise medicine articles over the last decade. I have written a few myself and have been called upon to review quite a few more. In fact the MJA currently has 55 sports medicine articles in its online archives, more than any of anaesthetics, dermatology, ENT surgery, occupational medicine, ophthalmology, orthopaedic surgery, plastic surgery, pathology, rehabilitation medicine, renal medicine, urology or vascular surgery. The irony is that the MJA certainly considers sports medicine to be a specialty area of medicine. However its parent body the AMA, like the Medicare system, still does not appear to consider sports medicine to be a fully legitimate medical specialty.

In the AMA’s schedule of recommended

fees, they recommend that sports physicians work in only the area of sports medicine (as 'non-specialists' in this area) and charge at a rate far lower than other similar specialists. The Medicare system also treats sports physicians in a similar fashion, but at least there are no fee caps under Medicare and you can charge what you like. The AMA actually does do a deal with the Worker's Compensation body in my state, NSW, to cap all doctors fees at the rates set by the AMA (other than surgeons, not surprisingly, who can charge above the already lucrative rate). So, whether you are a member or not, the AMA still looks after you if you are a surgeon and shafts if you are a sports physician.

Another example of the disgraceful treatment of sports physicians by the AMA was the plan that it mapped out with the Howard government (shortly before its tragic demise) to give GPs access to a limited number of MRI scans (e.g. knee) under Medicare. This is a sensible and legitimate request. However, the ALP is far less beholden to the AMA and, as such, it is still unclear at the time of writing whether Nicola Roxon is going to follow-through with this plan. At the moment, only 'specialists' can order knee MRI scans under Medicare and the AMA and Medicare agree that sports physicians aren't specialists. The deal would have meant that the only recognised doctors that wouldn't be able to order knee MRI scans under Medicare would be sports physicians. It is ironic that I have written an article in the AMA's journal, the MJA, on the appropriate use of MRI and other radiology in sports medicine, but I still can't order an MRI under Medicare. As far as I am aware, the AMA has never had any concern that sports physicians can't order musculoskeletal MRI scans under Medicare and has never made any representations to have this anomaly corrected.

Obviously sports physicians only represent a small percentage of SMA's members and hence a small part of the broader field of sports and exercise medicine as a whole. Not surprisingly, the AMA's approach to the broader family of sports medicine practitioners is no better. Those doctors who are not sports physicians are mainly GPs and the AMA's attitude to them historically

has been appalling. The AMA also rates their time as being worth far less than specialists, with no exception made for GPs who have undertaken extensive further education such as Masters or PhD degrees. According to the AMA, if you are a GP this status itself makes you a less worthy medical practitioner than a specialist, just as being a sports physician makes you less worthy. It is one thing for Medicare to not want to pay more, but another for your so-called representative body to say that you are worth less than other doctors. I recall the AMA being part of a relative values study in the 1990s which, amongst other things, suggested that specialists had greater practice expenses than GPs because they had to drive cars like BMWs whilst GPs only had to drive around in Holden Barinas.

The AMA would not for a minute be concerned about the fees of non-doctor sports medicine practitioners such as physiotherapists, dietitians, physiologists or podiatrists, and perhaps nor should they be. But they can be counted upon to argue that the government doesn't take a cent out of the pockets of procedural specialists to support any of them. The AMA staunchly upholds a Medicare system that funds surgery for patellofemoral pain rather than physiotherapy and surgery for plantar fasciitis rather than podiatry. In other words, the AMA's vision of a Medicare utopia is one that funds treatment based on the status of the practitioner rather than what actually works for the patient.

Last but not least, the AMA seems to have a relative blind spot on the public health radar with respect to the value of exercise itself. To its credit, the AMA has been more active with policy statements in recent years in areas such as smoking, indigenous health and nutrition. The AMA released a "Position Statement on Obesity" in early 2008 which has some welcome and timely suggestions, including extra taxes and bans on the advertising of junk food to kids. Included in this statement the AMA made brief comment on physical activity, echoing the recent logical calls for better urban planning to encourage incidental everyday physical activity. Surprisingly, the phrase "exercise prescription", which is health professionals recommending exercise to their patients, either in addition to or in lieu of medications,

didn't get a mention. This should be core business for the medical profession and it is amazing that the AMA doesn't strongly promote exercise prescription. True to form, when it came to the AMA's requested changes to the medical system to combat obesity, the AMA reverted to type as a trade union for the proceduralists. Sports and exercise medicine physicians, exercise physiologists, physiotherapists, dietitians and GPs (and their government funding, or lack thereof) didn't rate a mention in the obesity position statement. But bariatric surgeons and bariatric surgery did get highlighted and in fact the AMA called for greater funding for these procedures, including funding for more surgeons to be trained in performing them. Newer forms of bariatric surgery (the "laparoscopic band" procedures) are certainly the most effective way at reversing super-obesity, but equally surgery is not the 'big picture' answer for getting the majority of the population exercising more.

With releases like the "Position Statement on Obesity", the AMA is trying to create the appearance it has evolved from a trade union for procedural specialists to a responsible body promoting better health for society, but has it really gone the whole way? It is certain that the Royal Australasian College of Surgeons (RACS) would have had some input into the AMA's position statement and call for extra surgical funding. It is equally certain that the AMA didn't consult SMA or the ACSP in drafting the statement. If SMA were consulted, they would have recommended highlighting the positive messages - exercise and healthy eating - with less highlighting of the negative end product, obesity. This tends to lead to finger-pointing, which was the hallmark of the Howard approach that abdicated government responsibility. The AMA's position statement is in contrast to an American program entitled "Exercise is medicine" (www.exerciseismedicine.org). This is a joint venture of the American Medical Association and the American College of Sports Medicine (ACSM), the analogous body to SMA. While the USA hasn't got all of the answers for obesity, at least this campaign has got the primary focus where it should be - on exercise prescription.

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Journal of Science and Medicine in Sport

Top 5 downloads

Warm-up or stretch as preparation for sprint performance?

JSAMS, Volume 10, Issue 6, 1 December 2007, Pages 403-410

Stewart, M.; Adams, R.; Alonso, A.; Van Koesveld, B.; Campbell, S.

Profile of movement demands of national football players in Australia

JSAMS, Volume 9, Issue 4, 1 August 2006, Pages 334-341

Burgess, D.J.; Naughton, G.; Norton, K.I.

Heat stress and strain in exercise and sport

JSAMS, Volume 11, Issue 1, 1 January 2008, Pages 6-19

Brotherhood, J.R.

Does warming up prevent injury in sport?

JSAMS, Volume 9, Issue 3, 1 June 2006, Pages 214-220

Fradkin, A.J.; Gabbe, B.J.; Cameron, P.A.

Physiological limits to exercise performance in the heat

JSAMS, Volume 11, Issue 1, 1 January 2008, Pages 66-71

Hargreaves, M.

July 2008 - Science and Medicine of Triathlon

This is the first journal publication devoted entirely to the science of triathlon. Part of the uniqueness of triathlon is that the sport comprises (short) sprint and Olympic distance as well as long distance and ironman triathlon events. This issue of JSAMS includes:

- Maximising performance in triathlon: Applied physiological and nutritional aspects of elite and non-elite competitions by D.J. Bentley, G.R. Cox, D. Green and P.B. Laursen
- Triathlon related musculoskeletal injuries: The status of injury prevention knowledge by C. M. Gosling, B.J. Gabbe and A.B. Forbes
- Central hemodynamics in ultra-endurance athletes by W.L. Knez, J.E. Sharman, D.G. Jenkins and J.S. Coombes
- Physiological and electromyographic responses during 40-km cycling time trial: Relationship to muscle coordination and performance by R.R. Bini, F. Diefenthaler and C.B. Mota

Coming up in the next issue of JSAMS

- The modified D-max is a valid lactate threshold measurement in veteran cyclists by James W fell
- The Effect of a Physical Activity Education Programme on Physical Activity, Fitness, Quality of Life and Attitudes to Exercise in Obese Females by Catherine Doody
- Delay of 6 weeks between aprotinin injections for tendinopathy reduces risk of allergic reaction by John Orchard
- Effect of recovery intensity on peak power output and the development of heat strain during intermittent sprint exercise while under heat stress by Neil S. Maxwell
- Letter to the editor Should observational clinical studies require ethics committee approval? By Georg Roggla

Discipline Group News

Sports Dietitians Australia

Nutrition for Exercise and Sport (NES) is an education course SDA developed some years ago and is now run in all states of Australia.

NES *Junior* is a course targeted at the **Australian Council for Health, Physical Education and Recreation** (ACHPER) members, school teachers, coaches of junior athletes, parents, and people involved in junior sporting clubs and NES *Active* is suitable for Personal trainers, fitness leaders, senior coaches, athletes, other health professional, defence forces, CFA/SES and other active work places are the main participants at this course.

Both courses are accredited with Fitness Australia and Kinect Australia

The link to our website is here <http://www.sportsdietitians.com.au/www/html/1785-news--events.asp> where further course information and registration forms can be found.

College of Sports Psychologists

APS and NZPSS sign Memorandum of Understanding

The Australian Psychological Society and the New Zealand Psychological Society sign a Memorandum of Understanding (MoU). The MoU affirms that the APS and NZPSS share the objective of advancing the discipline and profession of psychology in the public interest. The MoU also affirms the working relationship between the two Societies and commits to regular communication to discuss issues of common concern.

Draft Consensus statement about Sports Injury Surveillance and Prevention in Australia

By John Orchard, Caroline Finch & Gary Moorhead

This statement is in draft form only, for discussion and response. It is hoped that it can be amended by stakeholders over the following months to a version where multiple sports medicine and sporting bodies in Australia would be prepared to agree to it. Please direct any feedback to John Orchard via SMA at lesley.crompton@sma.org.au.

1. **The rationale for sports injury prevention as an important contributor to fighting inactivity.**

Inactivity will soon surpass smoking as the most costly preventable risk factor for premature death in Western countries¹. Despite this, up to 50% of the potential health gain of increased sport and exercise may be lost because of the effects of injury². Therefore sports injury prevention is a critical component to successful exercise promotion³⁻⁵. An increasing number of countries are recognising this important link and establishing or improving national sports injury surveillance systems⁶. Preventing obesity has just been announced as a new National Health Priority Area in Australia⁷. Injury prevention and control is already one of the seven established National Health Priority Areas, although within this category, sports injury is not currently considered⁸. The nexus between these two areas should no longer be ignored. Preventing sports injury should also be seen as a national priority with respect to both categories: avoiding injury and preventing inactivity and obesity.

2. **Australia does not currently follow world's best practice in sports injury surveillance.** Australia has no national system for monitoring and preventing sports injuries^{6,9-11}. This deficiency, whilst it persists, is causing

us to fall further behind world's best practice in this area. We are in a strong position to copy some or all of the system(s) of our close neighbour New Zealand. Popular sports in Australia are also popular in New Zealand, which has had a national sports injury surveillance system in place for many years. As a result, New Zealand is far more advanced than Australia in successfully achieving sports injury prevention¹². Other countries, in particular those of Western Europe and Scandinavia, currently have much more advanced systems than Australia⁶.

3. **The Federal government is the most appropriate body to coordinate sports injury prevention.** The Federal government, through its Department of Health, is in the best position to set up and fund a national sports injury surveillance and prevention body^{6,11,13}. This could follow the New Zealand (or Scandinavian) model, where a government funded body (as opposed to the multitude of sports) is responsible for national coordination of sports injury data. In Australia the Federal government is the body which bears the greatest cost of sports injuries¹³ (through, collectively, Medicare, private health insurance rebates, and indirectly through public hospital subsidies to state governments). Therefore the Federal government would potentially have the most to gain financially from successful sports injury prevention, as has been the case in New Zealand¹². There are very few sports in Australia, if any, which would be wealthy enough to be able to fund their own national injury surveillance schemes as the vast majority of people playing sport are amateurs. There is also little

financial incentive for sports to fund injury surveillance given the reality that government institutions (along with individuals) pay for most of the cost of sports injuries. The costs of sports injuries in Australia, whilst not specifically known, are substantial. In New Zealand the costs of sports injuries actually exceed those of traffic accidents¹⁴. In Australia, traffic accidents are known to cost A\$17 billion annually¹⁵. In Switzerland, a country with one third of Australia's population, there was an annual cost for sports injuries in 2003 of €1.3 billion with indirect costs being €8 billion¹⁶ and with 5.6 million working days lost. Extrapolating from these recent figures it is very likely that previous calculations of the costs of sports injuries in Australia were gross underestimations. The total annual cost of sports injuries in Australia would be likely to exceed A\$10 billion.

4. **The benefits, even in the short term, would easily outweigh the costs of improved sports injury prevention in Australia.** Sports injuries are already very costly for the Australian health system and for the individuals who suffer from them. It would be even more costly for the Federal government to compensate sports injuries to the level evident in New Zealand. This would require careful consideration of the huge costs involved and the relative benefits. However, in the interim, a surveillance and prevention body could be created with a significantly more modest budget. It is likely that such a body would demonstrate, as in New Zealand¹², cost savings to the government (far exceeding implementation costs) from programs such as:

- a. Coordinating expansion of the Australian Spinal Cord Injury Register (ASCIR)¹⁷ to include a section which reports annually on spinal injuries specifically in sport, reflecting the success New Zealand has had in prevention of spinal cord injury in sports such as rugby union¹⁸⁻²⁰.
- b. Creation of a national knee Anterior Cruciate Ligament (ACL) registry, modelled on the successful registries in the Scandinavian countries²¹. This could use data from Medicare and public and private hospitals. ACL injuries perhaps account for 10% of the cost of *all* sporting injuries in Australia and therefore should be a priority for prevention. A substantial proportion (estimated at over 20%) of the 25,000 or more knee replacements performed annually in Australia have their genesis in ACL injuries.
- c. Creation of a program to substantially increase the rate of mouthguard usage in contact sports, by encouraging rule changes and perhaps targeting a rebate for dental injury treatment for those players who are injured whilst wearing a mouthguard. This would also replicate the success of New Zealand in increasing mouthguard usage²².
- d. Compulsory compilation, in return for a fee, of de-identified injury data from those bodies which already collect sports injury data in Australia (private health *and* sports insurers *and* public hospitals). This data would form the basis of an annual report into trends regarding sports injuries in Australia.
- e. Arising out of item d., recommend and activate research and prevention based on annual statistics of sports injury in Australia.

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The Australian Medical Association, by contrast, perhaps *wants* the focus on obesity rather than exercise, because it fits in nicely with advocacy for procedural specialists. If our AMA wants to cross the road completely to becoming socially responsible in the area of exercise/obesity/nutrition, the next time it does a release it could consult sports and exercise physicians and SMA, as well as the College of Surgeons. Perhaps the best slogan for their current campaign on obesity, which sums up the entire attitude of the AMA to exercise, would be "Exercise your right to have an operation". It is sad that, to date, the AMA certainly hasn't embraced sports and exercise medicine. Shunned is a more apt description. Given that the AMA has lost its cushy relationship it had with the Howard government, it might need to start looking at ways to re-invent itself somewhat (rather than the time-honoured plan A of just campaigning for a Coalition government). An important item on its agenda should be to assess why it has treated an entire branch of doctors as outcasts over the last 15 years. If Medicare finally recognises sports physicians as specialists, the AMA may well follow suit (and how ironic would it be that the medical union would lag behind the government in this regard?).

There are many more bridges that will need building before the AMA can be considered at the forefront of exercise medicine. Given that lack of exercise is now Australia's largest preventable predictor of ill-health, it is still obvious that the AMA's prime concern is the welfare of doctors who make lots of money out of illness.

Anti-inflammatory Drugs – Their Role In Sports Medicine:

A personal viewpoint

By Chris Milne

Last year at the SMA conference in Adelaide I ran a workshop on the topic of NSAID and cox-2 agents in musculoskeletal injury. The session was well received and engendered a good level of debate and I was asked to repeat it again this year. Unfortunately, I cannot be at the SMA conference on Hamilton Island and thought that this article would give wider exposure to this important topic.

As readers will be aware, anti-inflammatory agents have been in widespread use for a variety of conditions since the development of aspirin in 1899. There are four common clinical indications for use of these agents.

1. Inflammatory arthropathies, including rheumatoid arthritis plus the seronegative arthropathies and crystal arthropathies.
2. Osteoarthritis, which is more than just a simple wear and tear disorder. Modern day thinking is that it is a pan-articular inflammatory process and, therefore, the use of NSAIDs is entirely rational for osteoarthritis. Moreover, our patients tell us that they are more effective than paracetamol despite what the published data would tend to suggest.
3. Soft tissue injuries with a significant inflammatory component. This includes an effusion in a joint following an injury or inflammatory conditions involving muscle or tendon attachments.
4. Anti-inflammatory agents are effective analgesics in their own right and have been particularly useful for post-operative and dental pain and headache.

Their mechanism of action has only been understood following the discovery of prostaglandins in the 1960s. The NSAIDs inhibit prostaglandin synthesis. They also inhibit leukotriene synthesis,

lysozyme release and neutrophil aggregation. At the cell membrane level, they alter ion fluxes.

The major publicity in the last decade or two has been around their toxicity; their efficacy is unquestioned. A lot of the research effort has gone into making agents that are less toxic to the upper GI tract. This is because dyspepsia on standard NSAID affects about 10 per cent of people taking these drugs. However, the vast majority of people with dyspepsia do not have any serious medical consequence of this. There is a small minority of patients, often with coexistent disease or who have had a previous GI bleed or are taking corticosteroids, particularly those over the age of 60, who can have more serious GI bleeding and this can be fatal in some circumstances.

Therefore, a lot of effort has gone into developing more “GI friendly” NSAIDs. These agents selectively inhibit the cox-2 enzyme which affects chondrocytes and synovium, whilst sparing the cox-1, or “housekeeper”, enzyme which maintains the mucous lining of the stomach, among other things. However, like selectivity for beta blockers, cox-2 selectivity is only a relative phenomenon.

Importantly, cox-2 agents are no more effective than traditional agents and their only advantage is that they are better tolerated by the majority of people who experience dyspepsia on a traditional NSAID. However, there is a small minority of people who experience dyspepsia even on cox-2 agents.

An additional feature of concern was the widely publicised data with regard to Vioxx (rofecoxib) which, when used by doctors in the USA at a dose of 50mg daily, was found to have over twice the risk of adverse vascular events. The actual odds ratio was 2.19. However, in the dosage used widely in Australasia, i.e. 25mg per day, the odds ratio was

only 1.33. It will be no surprise to hear that those at greatest risk of vascular events were older people with adverse vascular risk factors.

All of this publicity has led to a lot of scaremongering, in my view. Patients have been paranoid about the use of these drugs and doctors have become pretty reticent about prescribing them.

What is the actual truth of the matter?

The largest meta-analysis of 138 randomised control trials involving 145,373 people found that the absolute risk of cardiovascular events, mainly myocardial infarction, increased from 0.9% per year to 1.2% per year across patient populations. This is a risk that most people would not worry unduly about. However, the media reported that the relative risk increased by 42%, which is correct but gives ample opportunity for scaremongering. This data was published in the British Medical Journal in 2006.

Since then there have been other side effects reported regarding other cox-2 agents. In particular, Vextra (valdecoxib) was found to have adverse skin reactions. More recently, Prexige (lumiracoxib) was found to have adverse effects on the liver. Both of these side effects were pretty uncommon but the regulatory authorities, in my view, were overly cautious and withdrew both of these agents from the market, thus denying clinicians the opportunity to use them in patients who may have gained from their use, and in which other agents had been tried and found to be unacceptable.

All of this has led to a situation where clinicians often feel on the defensive with regard to use of NSAIDs. As we all know, time is a commodity which is in short supply and rather than detail the pros and cons of a particular situation,

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Which sports medicine conditions are NSAIDs and cortisone injections useful for?

By John Orchard

One simple way to think about NSAIDs and cortisone – which can help best identify the conditions where they are useful – is that they are tissue “shrinkers”. By inhibiting inflammation, they also suppress the remodelling part process involved in turning over new tissue. Both NSAIDs and cortisone therefore have catabolic (the opposite of anabolic) properties. The question to ask yourself when considering treatment with cortisone and NSAIDs for musculoskeletal conditions is: “do I really want to shrink tissue?” If the answer is yes, then these forms of therapy are probably the best option. If the answer is no, then traditional analgesics may be a better choice for pain relief.

Which musculoskeletal conditions are ideal for using NSAIDs and cortisone injections? For any process that involves nerve impingement they will be first line therapy. The soft tissues (or even bone) causing the impingement may be “shrunk” slightly by the anti-inflammatory effect, but nerve, being a very low turnover tissue, won’t be directly affected by the anti-inflammatory action. The result is reduced pressure on the nerve and, hopefully, better pain relief than you might expect with a pure analgesic. Impingement conditions not involving nerves can also show great improvement with anti-inflammatory treatment – shoulder and ankle impingements, in particular, and conditions like iliotibial band friction syndrome of the knee. Conditions with ectopic tissue like myositis ossificans (where calcium deposits are laid down in muscle following a ‘cork’) also respond well to anti-inflammatory treatment, used to ‘shrink’ the offending new tissue. True ‘bursitis’, like those seen in prepatellar and olecranon bursas, is

still a great indication for a cortisone injection or NSAID treatment (in superficial cases like these, gel may even be preferable to tablets).

Where should NSAIDs and cortisone injections be avoided? For degenerative conditions which involve delayed repair of an important tissue, cortisone injections and even NSAIDs can be detrimental. Pure tendinopathies, particularly for heavy load-bearing tendons like the Achilles, are a prime example where the risks and detrimental effects of anti-inflammatory medications may outweigh the benefits. Even in fractures, animal (and some human) studies strongly suggest that repair will generally be delayed by NSAID use. Therefore, in acute injuries where an important tissue is damaged, use analgesics in preference to NSAIDs. Similarly, in chronic degenerative (as opposed to inflammatory) arthritis, cortisone injections may lead to longer-term harm even after good short-term pain relief. For smaller joints like the A/C joint or finger joints, the effect of a cortisone injection in relieving scar tissue may outweigh any damage to the articular cartilage, but equation may swing around for an important large joint like the knee.

The extreme examples are easy to advise on. The difficult or ‘grey’ zone is when you have two competing processes which mean the effect of anti-inflammatory treatment could go either way. A classic is in shoulder pain – a cortisone injection might help relieve impingement, but if there is a rotator cuff tendon tear associated, it may also reduce healing and lead to extension of the tear. This is where investigation may be helpful in the decision on using

an injection. If an ultrasound shows an intact rotator cuff, it is a green light for a cortisone injection into the subacromial space. Degenerative tendinopathy may be an amber light with respect to an injection and a full-thickness tear may be a red light.

Imaging may be helpful for determining which muscle strains might be best treated with NSAIDs. A hamstring tear proven on MRI scan may have its healing potentially delayed by NSAIDs and lead to a greater risk of recurrence (http://www.richmondphysiotherapyclinic.com.au/hamstring_muscle_strain.pdf) whereas a back-related hamstring may benefit and have quicker return to play using NSAIDs.

It goes without saying that there are many areas of the body where it is important to make a correct diagnosis before automatically reaching for NSAIDs. Forefoot pain, for example, might be caused by a metatarsal stress fracture or Morton’s neuroma. Stress fracture healing would probably be decreased by the use of NSAIDs or cortisone, whereas Morton’s neuroma might respond very well and be improved with their use.

Even for areas where you should be cautious with cortisone injections, there may sometimes be good results. An excellent Australian study published in the BMJ in 2006 shows that cortisone injections are helpful for tennis elbow (which is a tendinopathy) in the short-term, but detrimental in the longer term. Reading this study makes you think twice about using cortisone in this condition, although there will be circumstances where short-term improvement can be very important to the patient whose long-term prognosis

the line of least resistance is just to move on and use some agent whose role is less controversial but which may, in itself, have lower efficacy.

Ultimately, the experience of the last five years is likely to lead to a lower rate of investment in potentially innovative medicines in future and, thereby, a lessening of the choice of medicines available to clinicians and patients.

What is a logical way through all of this?

1. I would advise clinicians to assess the severity of the pain, i.e. mild, moderate or severe.
2. They should ask about previous adverse drug reactions and relevant medical history. Such reactions include:
 - a. Dyspepsia (burning abdominal pain) with aspirin or other NSAIDs.
 - b. Reduced blood flow to kidneys can occur on NSAIDs. Usually this is occult but it may present as fluid retention in older people or those with borderline cardiac function.
 - c. A flare of asthma with NSAIDs is rare but well publicised and, once again, can put people off using

these agents in all asthmatics which, I believe, is irrational. However, such a flare may be serious so it needs to be looked out for.

In summary, most athletes can take standard NSAIDs without getting dyspepsia. For those who cannot, there are three options:

- a. Use of paracetamol 500mg two tablets up to four times daily is the option that no authorities would dispute. This agent is not associated with any adverse GI effects unless taken in overdose, where it can have toxic effects on the liver.
- b. Use of a standard NSAID with a low GI toxicity profile, e.g. Ibuprofen under cover of Losec (omeprazole).
- c. Use of a cox-2, e.g. Celebrex (celecoxib) or Arcoxia (etoricoxib), however it needs to be understood that these agents are more expensive. In the short term, e.g. one week for settling a joint effusion, this is not a major consideration provided it is pointed out to the patient prior to them leaving the doctor's office.

Finally, empowerment of patients involves giving them a choice and providing them with an information sheet detailing at least some of the information listed above. By this means, the clinician can be assured that the patients have access to relevant background material and are not denied use of medicine that could be of significant benefit to them.

It needs to be understood that the above is a personal viewpoint but, nevertheless, one that is shared by a large number (I might even say the majority) of clinicians who are well informed about the use of these agents.

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Chris Milne
is a Sports Physician
at Anglesea Sports Medicine
Hamilton, New Zealand

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is good anyway. A high demand patient (ranging from a high level tennis player to a car mechanic who gets tennis elbow pain from work) is the type scenario to be wary of injections. This sort of patient will still want to be loading the elbow in 6 months time and won't appreciate it if the cortisone "wears off".

There are some patients who will swear by cortisone injections and NSAIDs for many conditions and others who claim to get no effect even for conditions where they aren't meant to be as useful. This is part of the unknown zone in medicine. Maybe certain patients have over-active repair systems which regularly lay down excessive scar tissue. These patients may do well with cortisone injections and NSAIDs for many conditions. Knee medial ligament tears are one of many conditions in the body that can alternately heal badly by being "too loose" or "too scarred". For the patient that is not laying down much scar tissue and has a medial ligament that is not tightening up sufficiently, avoid using NSAIDs and cortisone.

Alternatively, for the patient that has a solid medial ligament but is getting a lot of pain at the insertion (perhaps developing a Pellegrini-Stieda lesion) then NSAIDs and cortisone would be beneficial.

It is also worth remembering the systemic side effects of NSAIDs in particular. They increase the risk of gastric bleeding, increase blood pressure and can be harmful for patients with poor kidney function. The upside is that they reduce the risk of bowel cancer and reduce clotting. These factors can help decide which patients should avoid (or may benefit from) NSAIDs. Cox-2 specific NSAIDs in general are better for stomach and worse for heart.

Even though NSAIDs and cortisone are out of favour for certain conditions, like tendinopathies and osteoarthritis, it is fortunate that there are 'newer' therapies out there as alternatives. Nitrate patches, shock wave (lithotripsy), glucosamine and injections of polidocanol, glucose, autologous blood, aprotinin, hyaluronic acid and even botulinum toxin may have

a place in the management of sports injuries and musculoskeletal pain.

John Orchard is a Sports Physician,
South Sydney Sports Medicine
& Sports Medicine at Sydney
University

Correspondence:
johnorchard@msn.com.au

For further reading:

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Sports Injury Prevention – What's it got to do with Physical Activity and Health?

By Caroline Finch

I was recently honoured to be a keynote speaker at the Second International Conference on Physical Activity and Public Health, held in Amsterdam in April this year. There has long been a call, amongst sports injury researchers at least, for the integration of safety promotion with broader efforts to promote physical activity. In light of this, the invitation to present at this conference was too good an offer for me to refuse.

This paper summarises the key points of my presentation entitled “Physical activity related injuries – uniting physical activity promotion and injury prevention to ensure safe active environments for all”. Recommendations outlined in the presentation for how this unification could be achieved are listed in closing.

As long ago as 1996, the most influential physical activity policy document, the US Surgeon General's Report ¹, recognised injury as being the major negative consequence of increasing physical activity. At about the same time, the Australian Government recognised the importance of sports safety to minimise the risk of injury in sport ². A very recent statement from Eurosafe ³, states that more than 50% of the physical activity health benefits are lost due to injury. It is somewhat surprising then, that the two fields of physical activity promotion and sports safety promotion have largely evolved in isolation of each other. Being “injury free” is just as much a state of good health as being of healthy weight or not having cardiovascular disease risk factors. It is time for efforts using physical activity to promote health to also promote being free of injury.

Physical activity participation is influenced by both social and physical

environment factors. One of the most important aspects of the physical environment for physical activity is its safety, both actual and perceived. Ensuring that sports and recreation grounds, for example, are safe for sports play and more general physical activity has immediate ramifications for the safety of individual participants and broader community-wide health. Other safety concerns arise in relation to settings for active transportation (e.g. pedestrian areas and bicycle paths) and the risk of inter-personal violence (e.g. stranger danger or muggings) whilst being active. Physical activity promotion efforts are unlikely to be fully successful unless significant attention is therefore also given to addressing safety issues across the full spectrum of physical activity from general play to formal sport. The good news is that injuries are NOT an inevitable part of participation and that any risk can be reduced/minimised or controlled by adoption of safety measures and policies ². This means that SAFE physical activity is a positive and achievable choice!

Australian research has demonstrated that injuries during sport are not a rare event, with about 5% of participants affected each year ⁴. Fortunately, the vast majority of these injuries are minor in nature and do not require significant treatment in a hospital setting ⁵. Nonetheless, collectively they have a significant public health impact with 27% of people sustaining sport/active recreation injuries requiring some form of medical treatment, 35 % adversely impacting on the injured person's quality of life and 36 % impeding participation in further activity ⁴. Overall, one in five adult Australians do not participate in more physical activity because of injury/

disability ⁶; this percentage is even higher in older people (e.g. 40% of 40 – 60 year olds) and in people who are overweight or obese. About 5% of adults also cite fear of injury as a reason for why they don't exercise more. This fear of injury has wider implications, with more than one in four parents having prevented or discouraged their child from a particular sport/physical activity because of safety concerns ⁷.

An oft-cited reason for the lack of integration of physical activity and sports safety strategies is that the word “injury” associated with such activity may put some people off sport. However, it is clear from even the limited injury statistics quoted above that this is not true. It is the actual experience of being injured and the subsequent fears that arise from these experiences that are the barriers to physical activity – not the mere mention of the word. With health promotion approaches such as SMA's Smart play Program (www.smartplay.com.au) there is no doubt that promotion of SAFE physical activity attracts participants – ignoring the “injury” word does not. It is surely time for physical activity promotion to also incorporate safety promotion strategies.

To ensure SAFE physical activity, prevention and promotion measures need to be relevant, acceptable, adopted, and complied with. Only research that can be adopted in practice (in the physical activity context) will prevent injuries ⁸. This will require significant investment from BOTH injury and physical activity experts in a united approach. The actions that will need to be taken over the next few years to achieve this include:

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Sports Injury Prevention at the 9th World Conference on Injury Control and Violence Prevention

By Caroline Finch

The biennial, premiere international injury prevention conference (The World Conference on Injury Control and Violence Prevention) was held in Merida Mexico in March 2008. As usual, this meeting brought together the “Who’s Who” of injury prevention and control research, policy and practice from around the world. The contexts of injury discussed included sport and active recreation, the home, work, roads and other transport, natural disasters, violence and self-harm, amongst others. There was particular discussion about capacity building for injury prevention, new policy imperatives and directions, quality data collections and trauma management systems. Pre-conference meetings also meant that the leading international injury surveillance and data coding systems experts also attended.

This year’s conference included a very well attended Invited Symposium “Sports Injuries: Challenges for Research and Action”, a proffered paper section and some posters. A number of other papers and posters at this conference were related to active recreational pursuits, largely associated with water-based activities such as risk perceptions in relation to drowning, recreational boating and use of personal floatation devices. Following is a précis of the presentations directly related to sports injury and their prevention.

The “Sports Injuries: Challenges for Research and Action” began with my own presentation in which I argued that sports injury prevention and safety initiatives would be significantly progressed in the future if more emphasis was given towards the conduct

of effectiveness studies. Such studies would provide real-world assessment of whether or not interventions shown to be efficacious would actually work when implemented directly into sporting contexts. Dr Brent Hagel (University of Calgary, Canada) discussed the vexed issue of whether or not the introduction of safety measures would lead to an adverse change in user behaviour with potential negative injury consequences. He reviewed the literature specifically relating to the use of helmets by cyclists and skiers and wrist guards in sport and recreational activities. In doing so, he provided compelling conclusions about the likelihood of any risk compensation that might occur. Prof Toomas Timpka (Linköping University, Sweden) introduced the recently established Sports Safe International (SSI) initiative as a global body for the promotion of sports safety. He concluded that all athletes have the right to well-being and health that can only be achieved by a balance between sports industry needs and safety-oriented scientific knowledge and evidence-based actions. Finally, Dr Claude Goulet (Laval University, Canada) argued that sports safety initiatives needed to be fully addressed within a perspective of broader efforts aimed at promotion physical activity participation. He stressed that latter are unlikely to be fully effective, if they continue to ignore the potential for sports injury risk.

Two proffered papers described injury patterns in two quite distinct sports. Ellen Yard (PhD candidate, Columbus University, USA) described injuries in formal junior championships for freestyle and Greco-roman wrestling injuries.

This study is the first to compare the rate and patterns of acute injuries in these two wrestling styles in juniors. It has led to some suggestions for possible preventive actions in the two forms of the sport. Toomas Timpka presented a study from PhD candidate, Stefan Backe, which described injuries in competitive rock climbers in Sweden. Overuse injuries were the most common in this group of athletes.

Another session describing advances in injury surveillance provided an opportunity to present a detailed analysis of the quality and completeness of the 10th Revision of the International Classifications of Diseases Australian Modification (ICD-10-AM) activity codes, which are used to identify sports injury cases in routine collections of health service data. I demonstrated that it was possible that up to 1 in 5 injury hospitalisations were for sports injuries, after accounting for missing or incomplete sports activity codes.

As is often the case with conferences, some of the more interesting research was presented as posters. Yard and colleagues (Columbus University, USA) described the use of real time injury surveillance to monitor injuries during high school sport. Timpka and his SSI colleagues discussed the need for a global sports safety policy in another poster. Timpka and Finch had a second poster that explained the relationship between the policy implications of health promotion versus sports safety approaches. Abbot and her colleagues (Youthsafe, Australia) described the formal evaluation of a training program

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- The state of being “injury-free” needs to be fully equated with being healthy so that when physical activity is promoted for health gains, that the prevention of injury is one of the health goals – delete from here i.e this is not just an issue in the sporting context, but there is the opportunity for the sport and physical activity sector to lead efforts in this direction.
- International, national and local physical activity promotion efforts will need to acknowledge the potential for some injury risk and promote proactive steps to minimise or remove (where appropriate) these risks.
- Safety promotion needs to be made fully synonymous with physical activity promotion, and vice versa, from both injury prevention and health promotion perspectives.
- New collaborations between physical activity and “sports” safety researchers, practitioners and policy makers need to be established.
- Effective partnerships will ensure that a) safety promotion is fully understood and placed within the understanding of the physical activity context and b) physical activity promotion efforts adopt and capitalise on vast safety knowledge in relationship to transportation, the built environment, workplace safety as well as sports and leisure.
- There is a need for a shift in some sports injury research to include an increased focus on a broad physical activity context (rather than just focusing on organised sport)
- Accordingly sports injury researchers will need to pay more attention to understanding the particular contexts of, and influences on, physical activity and its associated injury risks and hazards
- Sports injury intervention effectiveness research needs to be well grounded in the physical activity context, particularly when interventions developed through working with high performance athletes or very organised sports teams need to be translated to, and adopted by, less formal, or more community-delivered, activity settings
- Finally, until sport (in its organised forms) is recognised as being an important part of physical activity and health promotion efforts, it will be hard for researchers working in this developing nexus area to publish their research in high quality journals.

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Professor Caroline Finch is a NHMRC Principal Research Fellow at the School of Human Movement and Sport Sciences, University of Ballarat, Victoria, Australia

Correspondence: c.finch@ballarat.edu.au

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aimed at encouraging soccer clubs to adopt how a risk management approach to sports safety.

For some reason that eludes me, this meeting continues to be poorly attended by people working in sports injury prevention – this is reflected, in part, by the range of presentations at this meeting, as described above. This conference is the major international source about new knowledge on the science of, and research methodologies for, injury research and implementation. If sports injury prevention researchers do not attend it, they are unlikely to be well-versed in the latest thinking about how to undertake injury research nor will they be exposed to new ideas that could benefit research in our specific area. Similarly, if sports injury practitioners do not attend the meeting,

they will not learn about innovative implementation and policy actions undertaken in other injury contexts that could then be translated for the benefits of sports safety. Importantly, the general injury prevention community will never learn about the great work that is being done in sports injury prevention and will rate both its importance as low and its general scientific worth as being lower than that in other areas.

I personally, would not miss this biennial conference because of the broad benefits to my own research program. I would encourage many more sports safety experts to consider attending the meetings in future years (the next meeting will be held in 2010 in a place yet to be confirmed). From a personal point of view, it would also be great to have many more voices than just mine, and a couple of my international colleagues, singing the virtues of the

importance and quality of the sports injury work that is undertaken within sports medicine circles.

Professor Caroline Finch is a NHMRC Principal Research Fellow at the School of Human Movement and Sport Sciences, University of Ballarat, Victoria, Australia

Correspondence: c.finch@ballarat.edu.au

ACL prevention in Norway and Australia

By John Orchard

The 2nd World Sports Injury Prevention Congress in Tromsø was a great opportunity to become aware of the latest advances in the field in both Norway and around the world. Although many sports injury areas were discussed, prevention of knee anterior cruciate ligament (ACL) injuries is still rightly considered the Holy Grail. ACL injuries are common in many of the world's most popular sports and they regularly lead to knee osteoarthritis later in life. ACLs also disproportionately affect women. The rates of ACL injuries appear to have been increasing, partly because women worldwide have been increasingly participating in change-of-direction sports in recent years.

Traditionally, ACL risk factors are divided into potentially-preventable and non-preventable risk factors and then into intrinsic (athlete-related) and extrinsic (non-athlete-related) risk factors. As an example, female gender

is an intrinsic but non-preventable risk factor. My personal interest has been in researching some of the potentially-preventable extrinsic risk factors for ACL injuries, particularly related to surface type in outdoor sports. In this sense I am unfashionable, in that the vast majority of researchers in the field of ACL prevention are firmly focused on studying the potentially-preventable intrinsic risk factors. The Tromsø conference confirmed my pessimism that extrinsic risks were being ignored relative to intrinsic factors, but raised my hopes that the researchers who specialise in intrinsic risks were actually on to something. There seem to be an increasing number of trials showing, almost exclusively in females, that balance exercises can decrease the risk of ACL injuries ¹. Importantly, some of the mechanisms by which these exercises work were becoming understood. These included increasing reaction time ² and getting the

semitendinosus tendon to fire earlier in a side-stepping movement ³. Both of these factors may contribute to decreasing the valgus force on the knee. It is promising that to date the ACL rate in Norwegian women's handball may have lowered ⁴ but no major change has yet been seen in women's college sports in the USA such as basketball and soccer ⁵.

There is some recent published extrinsic risk factor data, not surprisingly also coming out of Norway. Although I have argued recently that New Zealand is home to the world's best nationwide injury surveillance system ⁶, the greatest volume of quality of specific studies are certainly arising out of the Oslo Sports Trauma Research Centre (OSTRC). The Norwegians have found that wooden floors are less risky than artificial floors for ACL injury in handball ⁷. They have also compared ACL injury rates in Norway for football (soccer) games on natural grass and artificial turf and found no significant difference between the two surface types ⁸. I attended a session in which one of the most recent papers was presented and asked the author/presenters which types of natural grass were most commonly used on football fields in Norway. This question seemed to come from left field, so to speak, and neither of the presenters knew anything about natural grass other than it wasn't artificial. To me this may be a critical omission of observation that may, sadly, lead to bad decision making up to the highest echelons in FIFA. There is no doubt that, in certain circumstances, artificial turf may be a 'safe' surface in soccer. However, I am concerned that these 'circumstances' might be cold weather and it may be a mistake to give artificial surfaces the green light in warm climates ⁹. Whether I am right depends on whether you believe the observational data from Europe in soccer is a better predictor of outcomes in other climates than the observational data from



Figure 1 – with Willem van Mechelen (Netherlands) under the midnight sun in Tromsø



Figure 2 – the old gravel surface used in arctic climates for soccer games

other forms of football. Even though there is one study (with a small number of ACLs) from soccer in the USA¹⁰, the majority of warm-climate data on surface condition comes from other football codes¹¹. I personally think it should apply for injuries categories such as ACLs in soccer.

In other football codes, rye grass has been found to have lower shoe-surface traction than other grasses and lead to a lower risk of ACL injuries¹². With respect to all natural grasses, traffic appears to be a protective factor (the grass roots and lateral growth are cut up, which tends to lower shoe-surface traction)¹³. Hence an 'early-season' bias for most outdoor football competitions is observed. Fans of the AFL will have noted that seven ACL injuries occurred in the pre-season period this year but the rate of ACL injury has been much lower in the regular season, a pattern which



Figure 3 – artificial turf, a big improvement on gravel for soccer in the deep north

is seen in most years. ACL risk on natural grass will always drop as the season progresses unless there is growth of new grass (which happens in the spring and summer and when new portable slabs are brought in¹⁴). Some grasses have intrinsically more lateral growth and lead to more shoe-surface traction than others. Basically of the three most commonly used natural grass types around the world, ryegrass has less lateral

growth than the other two¹⁵ and is more likely to result in lower shoe-surface traction and lower risk of ACL injuries (Table 1).

The situation with artificial turf is different. Traffic doesn't change the shoe-surface traction at all – if the artificial surface was cut up by traction then it wouldn't last! However, Astroturf seems to lead to a much higher risk of ACL injury in hot temperatures than in cold temperatures^{9,15}. It is notable that the actual temperature of an artificial surface (like sand at the beach) is much closer to the ambient temperature in hot weather than it is for natural grass (which can stay remarkably cool). In a football competition with games played on artificial turf over autumn to winter, this will also produce an early-season bias (for slightly different reasons than the same pattern seen on natural grass).

With Astroturf it is simply a matter of the temperature getting colder; with natural grass it is the grass thickness changing. In temperate-warm climates on natural grass, there may actually be a change of grass type (from the higher-risk Bermuda to the lower-risk rye) over the course of the season as well. Unfortunately I haven't seen any data about temperature and

seasonal changes for the third-generation artificial surfaces but I don't have any reason to think the pattern would be different to Astroturf.

Hearing that new generation artificials in Norway (Figure 3) were of equivalent ACL risk to natural grass, I spent much of trip trying to observe and guess which types of natural grass they were using on sporting fields around Scandinavia. I was suspicious that the Norway studies might be comparing artificial surfaces at their best (in cold weather for most of the year) to natural grass not at its best (i.e. not ryegrass). My sample size was pretty small, was conducted in mid-summer only and my identification skills are not expert. However, I concluded that many sports fields in Norway probably use a hybrid natural grass surface (Figure 4; maybe fescues, Kentucky bluegrass, poa annua and a bit of ryegrass thrown in). This might make identifying grass types in Norway akin to identifying grape types in France – difficult because they mix it up so much. Maybe the researchers in Norway couldn't answer my question about grass type is because it is such a tough one! The result though was often a far bit of thatch (Figure 5) and potential for developing high traction. It may be quite likely that the climate in Norway is too cold to support ryegrass and there may be issues with increased shoe-surface traction once a natural surface freezes. It might be that, in Norway, artificial turf in the most sensible surface for a soccer ground.

What about a warmer climate, where the risk of playing on a third-generation artificial surface might be a lot higher? I haven't seen any soccer data from Africa, but I did hear at the conference, off the record, that the latest NFL data might be trending that way. I studied NFL ACL injuries in the Astroturf era and, whilst this surface was minimally riskier than natural grass, it was a fairly close comparison. If the NFL data is showing the disparity between third-generation artificials and natural grass is widening, it is a bit of a bombshell. I only hope that if these rumours are accurate that someone will come to a major sports medicine conference and present the findings (which didn't happen in Norway). As mentioned before, I hope that FIFA doesn't make the presumption that because artificial surfaces in Norway are safe that they also will be in Africa.

Table 1 – relative risk for ACL injuries on the major natural grass species

Grass species	Relative risk for ACL injuries	Preferred climate	Common distribution
Kentucky bluegrass (poa pratensis) – also known in UK as smooth-stalked meadow grass	Medium-High	Cool and dry	Northern USA, Canada, Continental Europe
Rye grass (Lolium perenne)	Low	Temperate and humid	United Kingdom, New Zealand, Japan, southern Australia & USA (winter)
Bermuda grass (cynodon dactylon) – also known in Australia as couch.	Medium-High	Warm	Northern Australia, Africa, Southern Asia, Southern Australia & USA (summer)

One of the non-reversible risk factors for ACL injury is previous ACL injury. In particular, ACL injury to the contralateral side is a known non-reversible risk. Re-injury to the ACL graft is also known but potentially modifiable and so is worth studying in more detail. For the non-serious athlete, the best way to reduce the risk of re-injury (both to graft, if used, and contralateral side) and subsequent arthritis is to retire from high risk sports. Therefore, many non-serious athletes may not need ACL grafts at all and, if they do require or elect to have ACL reconstruction, they are probably best advised to seek a surgical technique with minimum morbidity. The serious athlete who needs to keep playing is faced with the unfortunate reality that many ACL grafts don't hold up in difficult conditions. In the mid-1990s, particularly after David Schwarz suffered three ACL injuries on the same knee (one primary and two graft ruptures) within 12 months the belief in AFL medical circles was that perhaps the problem was that we were letting our players back too soon. However, sadly the rate of graft rupture in the AFL hasn't improved from the mid-1990s to today despite the average player missing closer to 10 months than the 6 months which was the standard of the 1990s. Even more sadly, ACL injuries are a common cause of career stagnation or regression for the 6% of players who have had one. At the end of the 2007 AFL season, the only two players ranked in Mike Sheahan's Top 50 who had previously had an ACL reconstruction were Cameron Mooney (no. 22) and Nick Malceski (no. 47). Perhaps at the end of 2008, Richardson, Didak, Hayes and Bradshaw (who

have all had knee reconstructions in the past) will break into Sheahan's Top 50. However, no player has ever won the Brownlow medal after having had an ACL reconstruction. In the NRL it looks slightly better if you create a 'Top 50' group of players from those who have played Origin or Test football in 2008. Of these, Justin Hodges, Brent Tate, Joel Monaghan and Ashley Harrison have come back from knee reconstructions. But in all codes there are many players who – even if they aren't in the 10% or so who re-rupture their graft – don't return to the same standard of play after an ACL reconstruction.

These fairly nasty statistics about outcomes would have been prominent in the discussions that the Swans had about the fairly radical option of a LARS (Ligament Augmentation and Reconstruction System) which they used for Nick Malceski. Even though he had ultimately had a relatively good outcome

**Figure 4 – fairly thatchy hybrid grass from Tromsø in Northern Norway**

from his patellar tendon traditional ACL reconstruction a few years earlier, he would have known first hand about the missed initial season and the slow return to good form in the season following. To date (at the time of writing) his LARS treatment has been a success, in that he is already playing games that he would have missed. We know that the older artificial ligaments from the 1980s generally led to bad results in ACL reconstructions, but a good article from The Age reminded use that Doug Hawkins was actually an isolated major success with an artificial ligament from this era¹⁶. We certainly need more than the small number of 2008 cases to know whether the new generation artificial is going to be a major advance.

One lesson we can immediately take on board is that surgeons should look acutely for preservation of the native ACL if it has only been torn or avulsed (as opposed to completely ruptured)

**Figure 5 – grass on a house in Western Norway with too much thatch?!**

at the initial injury. It sounds like in Malceski's case of 2008 that the LARS ligament was used as a reinforcement of the intact part of his ACL. Another similar case that didn't get as much publicity was Daniel Giansiracusa of the Western Bulldogs, who injured his ACL in the 2008 preseason but apparently had no reconstruction at all as the injured ligament looked as though it may heal in a good position with conservative treatment. At the Roosters we had a case in 2006 where the player concerned tore all of ACL, PCL and MCL and was rightly considered a career-threatening injury at the time. However, the surgeon treating him (Merv Cross) made the call that ACL and PCL had been peeled off together at femoral end and the main body of both ligaments was still intact. He did a direct repair with no graft for all three ligaments and the player came back successfully at 7 months. As a measure of the success, he is now one of the 2008 State of Origin players listed above. Like the Swans and the Western Bulldogs, we took an option which had some degree of risk but also had the upside of not requiring the player to have any of his own tendons sacrificed. Alisa Camplin did something along the same lines using a donor (allograft) tendon for her reconstruction before the 2006 Winter Olympics. I am aware that some of the Sydney knee surgeons are getting parents to donate graft tendons to their athlete children for knee reconstructions. It would not be surprising to see professional footballers use either of these techniques in the near future.

With respect to the traditional autografts, in Australia at the community level the vast majority of patients (or their surgeons) are choosing hamstring grafts for the morbidity advantages mentioned earlier. Matthew Liptak has presented data from AFL reconstructions done in the 1990s suggesting that the hamstring grafts in general do better than the patellar tendon grafts¹⁷, which supports this trend. However, for my elite players at the Roosters I still tend to recommend patella tendon grafts fixed with interference screws. I don't know whether it is the sport itself or other aspects of surgical technique, but our results have been hard to argue against from an observational viewpoint in terms of getting back to super-elite level.

Justin Hodges had a patellar tendon graft when at the Roosters and would now be in the current top 10 players in the NRL competition. I don't know how much knee pain he still gets, but I do know that the most important thing a professional rugby league centre would want from a knee reco is to return to the highest possible level. Another one of our patella tendon reconstructions, Ryan Cross, now plays at the very top level of rugby union for the Wallabies, in a similar position.

When in Norway, I chatted to Oslo's top knee surgeon Lars Engebretsen about ACL reconstructions. They have a national database of ACL reconstructions, which leads the world and is something we should try to emulate in Australia¹⁸. Ironically Lars doesn't use the LARS technique but prefers patellar grafts for high level athletes, hamstrings for low level and occasionally he'll do an allograft. He mentioned though that 80% of Norway surgeons use hamstring tendon allografts but for his elite athletes he still isn't convinced that they can get the players back to the same performance level as the patellar tendon grafts. Hans Mueller-Wolfhart at Bayern Munich, of Actovegin fame lately in Australia, sends his German elite players over to Colorado to get Richard Steadman to do patellar tendon autologous grafts for them. Dozens of elite English and European soccer players have been to Steadman to get their ACLs done, including Michael Owen and Ruud van Nistelrooy. When you travel, it seems that the patellar tendon autograft is still the world gold standard for super-elite athletes, even though hamstring autograft procedures are now undoubtedly the no. 1 procedure in the world for Joe Average.

Another very interesting thing I learnt in Norway was that Lars Engebretsen credits an ACL injury, to Susann Goksør Bjerkheim, for the entire formation of the Oslo Sports Trauma Research Centre. Previous lobbying for the government and private sectors to support such a centre had failed, but Susann's ACL injury was the catalyst for the powers in Norway to change their minds. Susann was the top handball player in Norway and was thought to be the key to the national team winning a Gold medal at the Sydney Olympics. There was national mourning when she tore her

ACL in early 2000, as the entire country considered that the injury had cost them a certain Gold medal. Like the genesis of the AIS out of the grief of the terrible Australian Olympic performance at Montreal, the politicians decided that something needed to be done about ACL prevention and they funded the OSTRC.

My final anecdote from the many I have about the trip comes from the Leprosy museum we visited in Bergen. Leprosy has been virtually eradicated in the Western world and the Norwegians are the most responsible for this. In the 1850s, at the time that John Snow was working out the cause for cholera in London, Norway founded the first ever national medical register for the disease leprosy. Armauer Hansen gets most of the credit for conquering leprosy by discovering the bacteria responsible (actually predating Koch's discovery of the tubercle bacillus). Ove Høegh should get as much credit for creating the register, as it was from this that Hansen was in fact sure that leprosy was an infectious disease and that therefore he needed to find the agent. Expanding from this history it is easy to understand why the Scandinavians still lead the world in both medical registers and public contribution towards disease prevention.



Figure 6 – The Broad St pump in Soho, London, where John Snow determined the cause of cholera in the 1850s. About the same time the Norwegians were determining the cause of leprosy, bringing in the era of modern epidemiology and public health

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Discipline Group News

Australian Association of Podiatric Sports Medicine

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Wednesday 13th August
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Australian Association for Exercise and Sports Science (AAESS)

NSW

Pre Surgery Management of End-stage Osteoarthritis of the Hip & Knee & Early Rehabilitation Following Total Joint Replacement
CBD Sydney
23rd August 2008, 9.00 – 4.00pm

Current Treatment and Post-Operative Management for Articular Cartilage Defects In The Knee
CBD Sydney
24th August 2008, 9.00 – 4.00pm
7 CEPs each
Closes 8th August

QLD

Pre Surgery Management of End-stage Osteoarthritis of the Hip & Knee & Early Rehabilitation Following Total Joint Replacement
1st November 2008, 9.00 – 4.00pm
Brisbane

Current Treatment and Post-Operative Management for Articular Cartilage Defects In The Knee
2nd November 2008, 9.00 – 4.00pm
Brisbane
7 CEPs each
Closes 17 October

WA

Self Management Workshop
9th August, 9.00am – 5.00pm
Perth
8 CEPs
Closes 25 July

ACT

Musculoskeletal Case Studies Workshop
21st September, 8.30am – 5.30pm
Canberra
8 CEPs
Closes 5 September

VIC

Pre Surgery Management of End-stage Osteoarthritis of the Hip & Knee & Early Rehabilitation Following Total Joint Replacement
4th October 2008, 9.00 – 4.00pm

Current Treatment and Post-Operative Management for Articular Cartilage Defects In The Knee
5th October 2008, 9.00 – 4.00pm
7 CEPs each
Closes 19 September

SA

Pre Surgery Management of End-stage Osteoarthritis of the Hip & Knee & Early Rehabilitation Following Total Joint Replacement
20th September 2008, 9.00 – 4.00pm
Adelaide

Current Treatment and Post-Operative Management for Articular Cartilage Defects In The Knee
21st September 2008, 9.00 – 4.00pm
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7 CEPs each
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AFL Injury Report: Season 2007

Released May 28th 2008

By John Orchard

The AFL has conducted and published an annual injury survey every season for the past 16 years, since 1992¹. This is the longest running injury surveillance system in Australia. The injury survey also has had a pivotal position in guiding the AFL Research Board to fund projects which study injuries that are common, severe and/or increasing in incidence in AFL players. As the AFL was also the first professional sporting body to implement a funded research board, it has distinguished itself as the most progressive professional sport in this country with respect to injury research.

Injury surveillance is now universally considered to be an important obligation of professional sporting bodies²⁻⁵. However, the degree to which it is successfully undertaken varies substantially. Nationally (and even internationally) the AFL injury survey structure is seen as a model of “how to get it right”, given that it leads to consistent reports and ongoing analysis of injuries. The first public release of the annual report was following the 1996 injury survey⁶, believed to be the first time in the world that a professional sport openly tabled its injury data.

METHODS

The methods of the injury survey are now well established and have been previously described in detail⁷, although minor changes to methods are made on an annual basis. The definition of an injury is “any injury or other medical condition that prevents a player from participating in a regular season (home and away) or finals match”. Player movement monitoring essentially requires that all clubs define the status of each player each round to be either: (1) playing AFL football (2) playing football at a lower level (3) not playing football due to injury or (4) not playing football for another reason. The injury survey coordinator can cross-check

the data provided by each club after the conclusion of the season with the player movement monitoring done in ‘real time’ during the season, in order to maximise compliance with the injury survey definition. Individual player injury details are not revealed in any report of the injury survey. Player Movement Monitoring has allowed the injury survey to achieve ‘100% compliance’ for all instances of missed player games since 1997⁷. In 2001 this was extended to include rookie listed players and finals matches.

Injury definition

The injury survey has defined an injury as a condition “causing a player to miss a match”. This decision was made with the aim of assuring maximum compliance to the survey and has enabled the capture of 100% of defined injury episodes since 1997. As a result the AFL injury survey is one of the few sports injury surveillance systems in use that is highly reliable⁷⁻⁹.

Injury categories

Injury categories have been slightly changed based on which specific diagnoses (using OSICS¹⁰) are included within each category in the 2007 analysis. Where changes have been made they have been made retrospectively for all previous survey years. Therefore, some of the category data presented in this report for previous years varies slightly from what is apparently the same data that has been published before in the previous reports.

One significant change which was made to injury categories for the 2008 report was that injuries which specifically occurred in events outside football were grouped with medical illnesses as part of an ‘other conditions’ category, where the mechanism was not considered related to playing AFL football. This change was applied retrospectively to all previous data.

Injury Rates

The major measurement of the number of injuries occurring is *seasonal injury incidence* measured in a unit of new injuries per club per season (where a club is defined as 40 players and a season is defined as 22 rounds). The major measurement of the amount of playing time missed through injury is *injury prevalence* measured in a unit of *missed games per club per season*, or alternatively *percentage of players unavailable through injury*. The recurrence rate is the number of recurrent injuries expressed as a percentage of the number of new injuries. A recurrent injury is an injury in the same injury category occurring on the same side of the body in a player during the same season. Therefore, by this definition, an injury of one type that recurred the following season was defined as a new injury in that next season.

All injury rates are adjusted to account for differing player list sizes and number of matches per club in each season, so that the injury rates reported each season represent a hypothetical club with 40 listed players participating in 22 matches.

RESULTS

Key indicators for the past ten years (and estimated key indicators for the previous five years) are shown in Table 1. The injury incidence (number of new injuries per club per season) for 2007 was in keeping with the low rates of recent years. However, injury prevalence, severity and recurrence rates all rose slightly in season 2007.

Injury incidence

Table 2 details the incidence of the major injury categories. The injury profile of 2007 shows diverging trends for some of the major categories. Incidence of head and neck injuries (combined),

Table 1 - Key indicators for all injuries over the past eleven seasons

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

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

Body area	Injury type	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Head/neck	Concussion	0.6	0.7	0.5	0.6	0.7	0.7	0.3	0.3	0.7	0.3	0.3
	Facial fractures	0.8	0.6	0.7	0.7	0.4	0.4	0.6	0.8	0.6	0.3	0.4
	Neck sprains	0.1	0.2	0.2	0.2	0.1	0.0	0.0	0.1	0.2	0.3	0.1
	Other head/neck injuries	0.2	0.2	0.2	0.1	0.3	0.2	0.3	0.2	0.1	0.2	0.2
Shoulder/arm/elbow	Shoulder sprains and dislocations	1.0	0.9	0.7	0.7	1.1	0.9	1.3	1.0	1.4	1.6	1.0
	A/C joint injuries	0.9	0.9	0.6	1.3	0.9	1.1	0.3	1.1	0.8	1.2	0.8
	Fractured clavicles	0.4	0.4	0.3	0.5	0.3	0.3	0.2	0.6	0.3	0.3	0.3
	Elbow sprains or joint injuries	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.1	0.1	0.1
	Other shoulder/arm/elbow injuries	0.6	0.5	0.2	0.5	0.5	0.8	0.5	0.4	0.6	0.3	0.2
Forearm/wrist/hand	Forearm/wrist/hand fractures	1.1	1.7	1.7	1.4	0.8	1.1	0.8	1.1	1.3	1.1	0.9
	Other hand/wrist/ forearm injuries	0.4	0.4	0.4	0.5	0.3	0.4	0.7	0.4	0.3	0.3	0.6
Trunk/back	Rib and chest wall injuries	1.2	0.6	1.0	0.8	0.4	0.9	0.8	0.7	0.4	1.0	0.4
	Lumbar and thoracic spine injuries	1.8	1.4	1.4	2.2	1.4	0.9	0.8	1.6	2.1	1.5	1.3
	Other buttock/back/trunk injuries	1.2	1.0	1.1	0.8	0.5	0.4	0.5	0.6	0.4	0.6	0.5
Hip/groin/thigh	Groin strains/osteitis pubis	4.1	3.2	3.1	3.0	3.5	3.8	2.8	3.1	2.9	3.3	4.1
	Hamstring strains	6.6	6.4	6.7	5.6	6.0	4.4	5.8	6.3	5.2	6.4	6.7
	Quadriceps strains	2.5	3.0	2.4	2.0	1.6	1.7	2.0	1.9	1.9	1.7	1.8
	Thigh and hip haematomas	1.3	1.3	1.1	1.1	0.6	1.0	0.3	1.1	1.0	1.1	0.6
	Other hip/groin/thigh injuries	0.4	0.2	0.3	0.3	0.3	0.3	0.4	0.3	0.2	0.3	0.8
Knee	Knee ACL	1.2	0.8	0.7	0.5	0.9	0.8	0.6	0.5	0.6	1.0	0.7
	Knee MCL	0.7	1.3	1.2	0.9	1.2	0.9	1.0	0.7	1.0	0.8	1.4
	Knee PCL	0.6	0.3	0.7	0.5	1.0	0.4	0.5	0.7	0.4	0.3	0.2
	Knee cartilage	0.9	1.1	1.1	1.2	1.9	1.3	1.7	1.2	1.3	1.0	1.2
	Patella injuries	0.2	0.4	0.1	0.2	0.2	0.4	0.1	0.1	0.3	0.3	0.3
	Knee tendon injuries	0.5	0.6	0.7	0.7	0.5	0.8	0.7	0.4	0.7	0.4	0.3
	Other knee injuries	1.4	0.4	0.9	1.3	0.8	0.5	0.7	0.7	0.9	0.2	0.8
Shin/ankle/foot	Ankle sprains or joint injuries	2.7	2.8	2.1	2.7	2.0	2.5	2.6	2.5	2.5	2.1	2.2
	Calf strains	1.9	2.3	1.4	1.9	1.6	2.2	1.6	0.9	1.9	1.6	1.2
	Achilles tendon injuries	0.4	0.3	0.5	0.4	0.2	0.4	0.4	0.2	0.3	0.3	0.4
	Leg and foot fractures	0.5	0.8	1.1	0.6	1.0	0.8	0.5	0.5	0.4	0.7	0.5
	Leg and foot stress fractures	0.8	0.7	0.8	0.5	0.9	0.7	0.9	0.9	0.9	1.1	1.1
	Other leg/foot/ankle injuries	1.9	1.7	1.3	1.3	1.7	0.8	1.5	1.7	1.3	1.5	1.3
Other	Medical illnesses/ non- football injuries	2.7	2.9	1.7	2.2	2.0	2.6	2.8	2.1	2.3	0.9	2.1
NEW INJURIES / CLUB / SEASON		41.9	40.3	36.9	37.4	35.8	34.4	34.1	34.8	35.3	34.1	34.7

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

Injury type	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Hamstring strains	38%	36%	31%	37%	25%	30%	27%	22%	26%	16%	22%
Groin strains	36%	31%	6%	16%	20%	23%	20%	24%	23%	28%	38%
Ankle sprains	20%	21%	9%	11%	17%	16%	6%	11%	15%	10%	20%
Quadriceps strains	35%	20%	20%	18%	10%	17%	9%	6%	20%	19%	18%
Calf strains	15%	15%	17%	32%	17%	13%	14%	6%	12%	7%	9%
ALL INJURIES	20%	19%	14%	16%	15%	13%	14%	11%	14%	12%	16%

lumbar spine injuries, rib injuries and knee PCL (posterior cruciate ligament) injuries were at all time lows. However hamstring injury incidence was at its highest level since 1999 and groin injury incidence was at its highest level since 1997.

Injury recurrence

Table 3 shows the rate of recurrence of some of the common injury types, particularly muscle strains which have a comparatively high recurrence rate. Most contact-mechanism injuries, such as fractures, concussions and 'cork' injuries have a low recurrence rate. The issue of recurrence for muscle strains is the subject of ongoing research ¹¹. The rate of injury recurrence has been showing a fairly steady decline over the last 10 years, although the rate of 16% in season 2007 was a return to the long-term average. The recurrence rate for groin injuries in season 2007 was high at 38%.

Weekly player status and injury prevalence

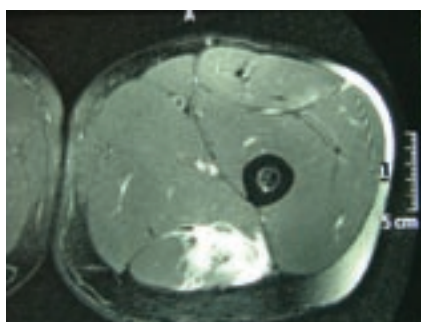
Table 4 details player status on a weekly basis over the past ten seasons. The 'average' status of a club list of 44 players in any given week for 2007 was:

- 34 players playing football per week;
- 7 missing through injury; and

- 3 missing through other reasons (such as suspension, being used as a travelling emergency, team bye in a lower grade, etc).

Table 5 details the amount of missed playing time attributed to the most notable injury categories. In season 2007, hamstring injuries continued as the no. 1 injury in the game with respect to missed playing time, surpassing both groin injuries and knee anterior cruciate ligament (ACL) injuries. Based on injury prevalence (missed playing time), these three categories are consistently the highest categories for injury prevalence. With respect to mechanism these injuries are most commonly non-contact.

As was the case with injury incidence, some divergent trends were noted in 2007. Knee PCL injuries and facial fractures were at an all time low with respect to contribution to missed playing time. However, hamstring and



groin injury prevalence were both at their highest levels since the commencement of injury surveillance.

ANALYSIS & DISCUSSION FOR SIGNIFICANT INJURY CATEGORIES

Hamstring injuries

Hamstring strains remain the most common injury in the AFL.

Previous analysis of hamstring and other muscle strain data shows a high rate of recurrence ¹¹⁻¹⁴. The current AFL data shows that management of these injuries has become more conservative over the last decade in the AFL, with recurrence tending to decrease ¹⁵ (Table 6). The risk of recurrence however does remain high and persists for three months after return to play because players often return with subtle strength deficits and/or biomechanical compensations ¹¹.

Head and neck injuries

Table 7 shows consistently low incidence and prevalence for head and neck injuries (combined) over the past decade. Season 2007 reported the lowest incidence of head & neck injuries since the survey was commenced, with a zero percent recurrence rate.

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 may have contributed to these positive trends.

Knee ligament injuries

Knee ligament injury incidence fell in 2007, particularly with respect to PCL

Table 4 - Average weekly player status by season

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

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

Body area	Injury type	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Head/neck	Concussion	0.7	0.7	0.5	0.7	1.3	2.0	0.6	0.3	0.9	0.3	0.3
	Facial fractures	2.5	2.0	2.2	2.0	1.3	1.4	1.0	2.2	1.4	0.8	0.7
	Neck sprains	0.6	0.7	1.6	0.3	0.2	0.0	0.0	0.6	0.3	0.3	1.1
	Other head/neck injuries	0.3	0.2	0.4	0.8	1.5	0.2	0.7	0.2	0.2	1.1	1.6
Shoulder/ arm/elbow	Shoulder sprains and dislocations	5.3	5.9	5.6	4.0	5.4	5.9	5.7	5.9	7.7	10.8	6.4
	A/C joint injuries	2.2	2.1	0.9	3.1	2.1	2.4	0.7	2.5	1.9	2.7	1.4
	Fractured clavicles	1.4	1.6	1.2	3.0	1.6	2.0	1.0	3.5	1.3	1.7	1.8
	Elbow sprains or joint injuries	0.7	1.2	0.2	0.1	0.4	0.3	0.4	0.7	0.4	0.7	0.8
	Other shoulder/arm/elbow injuries	2.4	1.9	0.3	1.3	1.3	3.4	1.6	1.6	2.4	1.7	0.7
Forearm/ wrist/hand	Forearm/wrist/hand fractures	4.1	5.4	5.9	5.6	2.7	3.1	2.5	3.9	3.8	4.3	2.3
	Other hand/wrist/ forearm injuries	0.6	1.3	0.9	1.4	0.3	2.2	2.9	1.2	1.2	0.5	3.1
Trunk/ back	Rib and chest wall injuries	2.8	1.0	2.0	1.3	0.7	1.5	1.7	1.3	0.6	2.2	1.9
	Lumbar and thoracic spine injuries	9.7	4.3	7.9	8.4	5.6	5.8	2.1	5.4	6.4	5.4	2.8
	Other buttock/back/trunk injuries	6.0	1.6	2.3	2.6	1.5	1.6	1.6	2.3	0.7	1.3	1.7
Hip/groin/ thigh	Groin strains/osteitis pubis	17.4	13.6	9.4	7.5	13.6	15.7	13.6	13.3	11.2	14.0	18.0
	Hamstring strains	20.9	21.0	22.3	22.4	21.3	15.6	18.7	21.6	18.6	21.8	24.3
	Quadriceps strains	8.6	9.5	6.7	5.6	3.8	4.3	6.0	4.2	6.4	5.5	5.6
	Thigh and hip haematomas	2.4	1.8	1.5	1.8	0.6	1.9	0.5	1.7	1.6	1.4	1.0
	Other hip/groin/thigh injuries	1.7	0.5	2.3	1.4	1.7	1.2	1.5	2.6	1.0	2.3	4.5
Knee	Knee ACL	19.8	15.8	10.8	4.8	13.6	15.3	10.8	10.1	9.3	15.3	15.9
	Knee MCL	3.3	4.3	3.3	3.5	4.8	2.8	2.9	2.9	3.0	1.7	4.7
	Knee PCL	1.9	2.2	5.2	2.3	5.9	2.3	2.0	6.5	2.7	1.8	1.6
	Knee cartilage	4.0	5.6	5.3	8.6	12.5	6.0	7.0	6.1	7.8	5.7	9.1
	Patella injuries	0.9	1.6	0.8	1.8	0.8	2.5	0.6	0.1	0.8	1.2	2.7
	Knee tendon injuries	2.4	1.6	3.9	3.9	2.5	3.7	2.9	0.9	2.6	1.8	0.7
	Other knee injuries	3.9	0.8	2.2	3.6	2.5	1.0	2.4	1.3	3.8	0.2	2.6
Shin/ ankle/foot	Ankle sprains or joint injuries	7.2	6.9	3.9	6.8	4.3	5.9	5.3	6.4	9.2	8.1	7.1
	Calf strains	5.8	6.4	3.4	5.7	3.4	4.4	3.8	1.7	4.5	3.4	3.1
	Achilles tendon injuries	1.3	1.4	1.3	1.6	0.7	0.9	1.5	0.8	1.9	2.1	2.2
	Leg and foot fractures	2.6	5.4	8.8	4.6	7.0	7.9	2.9	3.7	2.7	5.7	2.7
	Leg and foot stress fractures	4.9	4.0	6.7	3.8	4.4	3.9	5.3	6.3	5.1	8.2	6.8
	Other leg/foot/ankle injuries	6.4	5.1	3.1	3.9	4.2	2.3	3.7	4.3	4.2	4.1	4.2
Other	Medical illnesses/ non- football injuries	4.3	4.5	3.4	3.4	2.8	5.4	4.8	4.6	3.7	1.2	4.1
MISSED GAMES / CLUB / SEASON		159.2	141.9	135.9	131.8	136.4	134.7	118.7	131.0	129.2	139.5	147.5

Table 6 - Key indicators for hamstring strains over the past eleven seasons

Hamstring strains	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Incidence	6.6	6.4	6.7	5.6	6.0	4.4	5.8	6.3	5.2	6.4	6.7
Prevalence	20.9	21.0	22.3	22.4	21.3	15.6	18.7	21.6	18.6	21.8	24.3
Severity	3.2	3.3	3.3	4.0	3.5	3.5	3.2	3.4	3.6	3.4	3.6
Recurrence rate	38%	36%	31%	37%	25%	30%	27%	22%	26%	16%	22%

Table 7 - Key indicators for head & neck injuries over the past eleven seasons

Head and neck	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Incidence	1.8	1.6	1.6	1.6	1.5	1.2	1.2	1.4	1.6	1.0	0.9
Prevalence	4.1	3.5	4.6	3.8	4.2	3.7	2.2	3.3	2.7	2.5	3.7
Severity	2.3	2.2	3.0	2.3	2.9	3.0	1.8	2.4	1.7	2.6	4.0
Recurrence rate	0%	4%	4%	0%	0%	5%	9%	0%	3%	0%	0%

Table 8 - Key indicators for major knee ligament injuries over the past ten seasons

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

injuries. New rules were introduced in 2005 to limit the ruckman's run up, with the introduction of a 10 metre outer circle at centre bounces. There have been no centre bounce ruck mechanism PCL injuries in 2006 or 2007, indicating success with this rule change (Table 8). The trend of higher PCL injuries amongst ruckmen has been eliminated and there also appears to be a drop in 'ground-contact' PCL injuries.

Knee ACL injuries were at average rates for season 2007. There was a smaller number than usual occurring in the AFL Premiership Season matches, but a relatively high prevalence due to pre-existing ACL injuries where the player had not yet recovered from his reconstruction. These injuries are the subject of further research¹⁶ and due to their regular occurrence and devastating impact on footballers will continue to be a priority topic.

CONCLUSIONS

The AFL injury profile is moving further towards being predominantly one of non-contact injuries as key contact injuries such as head and neck injuries, rib injuries and knee PCL injuries continue to reduce in incidence. However, there still remains an enormous challenge in controlling key non-contact soft tissue injuries such as hamstring and groin strains, which showed rates in 2007 which were high by historical standards.

The ongoing trends in the injury incidence vindicate the approach the AFL is taking towards injury surveillance and research³. Possible variables that may have (or in some cases certainly have) reduced injury incidence over the past decade includes:

- (1) the new centre circle rule to limit the run-up of ruckmen at the centre bounce;
- (2) the program of ground condition testing and surveillance;
- (3) video surveillance and non tolerance of illegal play;
- (4) the introduction of specific rules, such as the rule to protect players from forceful contact when their head is over the ball;
- (5) the establishment of a research board which funds research projects to improve our knowledge base;
- (6) improved management and prevention of injuries at club level.

The AFL injury profile continues to be consistently defined and published in sports medicine scientific literature and in public media releases⁷. Hamstring injuries, knee ACL injuries and groin injuries (including osteitis pubis) are consistently the most prevalent injuries in AFL players.

- Historically, the AFL injury survey is the world's longest running publicly-released injury survey in sport^{1 7 17};
- The survey has run for 16 seasons, achieving 100% participation and compliance over the last 11 seasons;
- The survey defines an injury as a 'condition which causes a player to miss a game' striking a balance which has enabled comprehensive analysis without sacrificing compliance⁹; and
- The survey has led directly and indirectly to dozens of published studies and interventions which have improved the safety of the AFL competition^{1 7 11 14 16-29} (e.g. ruck rule changes to decrease PCL injuries and changes in ground preparation to reduce ACL injuries).

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EPODE

– A review by Sports and Paediatric Dietitian, Tanya Lewis, APD

What is EPODE?

By Tanya Lewis

EPODE stands for “Ensemble, Prevenons, L’obesite des Enfants” this is French for “Together We Can Prevent Childhood Obesity” an acronym given to a healthy eating and physical activity program born in France.

“Together” is a key element of EPODE as the program encompasses community organisations, local government, parents, schools, businesses and health services all working together. Each healthy community ‘site’ uses coordinated approaches and strong local leadership to promote healthy eating and activity.

Children have growth monitored on a regular basis and parents are advised of any concerns and also provided with nutrition and exercise advice. A number of programs and activities are set up within the community to make healthy choices easier choices.

Why EPODE?

EPODE has shown to be a successful program in France with over 100 communities involved and has also since been introduced to Belgium and Spain.

The need for a program to fight obesity is clear with the most recent representative data from Australia indicating that around 25% of school-aged children and adolescents¹ and 20% of preschool children² are overweight or obese, and that this figure continues to increase.

The South Australian version of EPODE will take a preventative approach to obesity. This would appear to link in effectively with other pre-existing health promotion programs in South Australia including; “Right Bite”³, a school canteen healthy eating policy, “Start Right Eat Right”⁴ a policy for child care centers and also the recent efforts toward modifying television advertising of “occasional” foods in children’s viewing times.

When EPODE?

The South Australian Government announced the decision to put funds into EPODE in late in March 2008. It is estimated that almost \$2million will be put into setting up the first five sites which will reportedly be named later in June.

There has been some controversy from the opposition, who argue that this program is so personalised the majority of students will miss out. However, the extended plans are to increase the number of communities involved by five per year to approximately twenty sites in 2011-12 which will incorporate around 200 schools. This is an appropriate amount of students to pilot effectiveness and if successful, it would be good to see the program made available to more communities.

What next?

Time will tell if the South Australian version of EPODE is successful and sustainable in Australia.

There has been limited information made available since the media release last March. The program may not retain the “EPODE” title here so keep watching the media and health reports for further information about health promoting communities.

What else?

The September 2007 edition of “Nutrition and Dietetics”, Journal of the Dietitians Association of Australia, including the Journal of the New Zealand Dietetic Association reported on some of the current programs and interventions for childhood obesity in Australia. One study to note is the PEACH (**P**arenting, **E**ating & **A**ctivity for **C**hild **H**ealth) study⁵. This is a multisite, Randomised Control Trial in Adelaide and Sydney and has proven to significantly reduce BMI and waist in overweight and obese 5-9 year olds⁵. This intervention examines the importance of parenting skills training.

Sports Dietitians Australia (SDA) also supports the importance of having a family approach to manage overweight children. SDA has a fact sheet available which offers some practical advice for parental involvement and encouraging activity: http://www.sportsdietitians.com.au/asset/1/upload/Fact_sheet18.pdf.

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be active '09



In October 2009, Sports Medicine Australia will host the paramount sports medicine, sports science, sports injury prevention and physical activity promotion conference event in Australia.

be active '09 is a multi-disciplinary event, combining the 2009 Australian Conference of Science and Medicine in Sport, the Seventh National Physical Activity Conference and the Sixth National Sports Injury Prevention Conference. **be active '09** brings together some of the finest speakers from Australia and around the world to present a comprehensive scientific forum on all facets of these fields - from elite performance to community participation in sport, physical activity and their impact on individual and public health.

be active '09 showcases the latest developments through keynote and invited presentations, symposia, practical workshops, free papers, posters and a trade exhibition. It will also provide extensive networking opportunities.

The anticipated outcome of **be active '09** is to assimilate, interpret and share scientific evidence with key stakeholders who are in a position to develop recommendations concerning effective policies and programs within their own jurisdictions.

Submission of Abstracts will open in January 2009 and close 31 March 2009.

be active '09 will be held 14 – 17 October 2009 at the Brisbane Convention & Exhibition Centre.

More information will be made available on www.beactive09.com or contact the Conference Secretariat on acsms@sma.org.au

be active '09 is proudly supported by the following groups



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Don't miss the boat

ACSMS 08 Conference

16-18 October 2008

Pack your bags and grab your sunblock, as this year Sports Medicine Australia's national conference takes you to breathtaking Hamilton Island.

Situated on one of the 74 tropical islands in the Coral Sea, between the Queensland coast and the Great Barrier Reef, Hamilton Island will provide the perfect backdrop to catch up on the latest in sports science and medicine, sports injury prevention and physical activity promotion.

Here is a taster of what to expect to whet your appetite.

What is ACSMS 08?

ACSMS 08 is the Asics Conference of Science and Medicine in Sport which is a multidisciplinary meeting and its purpose is to 'promote knowledge and practice in sports science and sports medicine by providing an interactive educational forum of the highest standard so that the participation, performance and wellbeing of Australians engaged in sport and physical activity may be ultimately enhanced'.

What's on the ACSMS 08 menu?

Speakers

A plethora of speakers from varying disciplines and backgrounds will impart the latest knowledge in sports science and medicine.

Keynote and invited speakers will include:

- Mr John Buchanan (*Former Australian Cricket Team Coach*)
- Professor Wendy Brown (*University of Queensland*)
- Mr Craig Purdam (*Head, AIS Physiotherapy*)
- Mr Dean Robinson (*High Performance Manager, Geelong Football Club*)

- Mrs Trish Wisbey-Roth (*Physiotherapy Practitioner & Researcher*)
- Dr Susan Backhouse (*UK Anti-doping expert*)
- Dr Michael Kellmann (*Sports Psychologist, University of Queensland*)
- Dr Kristiann Heesch (*School of Human Movement Studies, University of Queensland*)
- Professor Caroline Finch (*University of Ballarat*)
- Dr Steven Bird (*Charles Sturt University*)
- Professor Tim Cable (*John Moores University, Liverpool*)

Sessions

Conference sessions will focus on a range of topics including the shoulder, knee/ACL, tendon foot and ankle, biomechanics, recovery, nutrition, paediatric exercise science, physical activity (and young people, adults and environments), measurement, diabetes/peripheral vascular disease, sports injury and drugs in sport.

Hands-on workshops will include: Mobilisation techniques to augment foot function; Dental first aid; Knee exam; Assessment of cycling biomechanics to optimise performance and minimise injury; 100% ME - drugs in sport program; Assessment of core stability and proximal muscle function to optimise dynamic activity; Holistic treatment: more than body and mind; Groin injury examination; Ultrasound imaging in sports medicine and CPR accreditation.

Conference session highlights, on a day to day basis, are outlined below:

Day One

Major speakers include:

John Buchanan – Jurassic park revisited: research and science meets the dinosaur

Many aspects of cricket still exist as relics of the past – a dinosaur within the modern era. For cricket to make significant strides of change, it needs to not only embrace research and science, but also harness the power of these tools of change and create the new Jurassic Park of modern sport. John Buchanan briefly touches on some of the areas that he has seen where research and science can greatly assist the acceleration of this evolution.

Michael Kellmann - Is recovery important?

Coaches and researchers suggest that enhanced recovery allows athletes to train more, and thus improves their overall fitness (aerobic, strength and power), technique and efficiency. Although most coaches recognise that recovery is crucial within the sport setting, they often have limited knowledge of what recovery modalities and monitoring tools are available. This introductory paper will briefly provide an overview of physiological and psychological aspects of recovery. It will then be followed by the research papers in this session.

Trish Wisbey-Roth – The lumbo-pelvic hip complex – The challenge of optimizing intervention to maximise dynamic activity

Leading physiotherapy researcher and founder member of the Low Back Interest Group Australia will give delegates insights into research outcomes from the group's research over the last three years.

Stephen Bird – Exercise physiology: Current trends in enhancing athletic performance”

Resistance exercise researcher provides insights from his work as a lead paper to the exercise physiology free papers session.

Free Papers include:

Overweight children have poor bone strength relative to body weight, placing them at greater risk for forearm fractures

Overweight children have stronger bones due to greater muscle size. However, children with high fat mass relative to muscle mass (increased adiposity) have poorer bone strength, independent of weight, which may contribute to the increased risk of fracture in obese children.

Handgrip strength and future dementia in elderly men: The Honolulu-Asia Ageing Study

Handgrip strength is a predictor of disability, mortality and cognitive decline. This study examined the association of mid-life to late-life grip strength, and change between mid-life and late-life, with future risk of dementia.

Day Two

Major Speakers include:

Refshauge Lecture: Wendy Brown – Stand up, sit down, keep moving: how much activity for a merry and bright old age?"

This year's Refshauge Lecture showcases one of Australia's leading researchers in the field of physical activity and health giving a definitive lecture on dose response to exercise and physical activity drawing on the latest research in the field.

Caroline Finch – Using behavioural and health promotion theories to guide sports injury prevention and safety promotion

This session will present the review findings and provide an overview of the theories most relevant to sports injury prevention. Some suggestions for the design of future sports injury studies that could benefit from the incorporation of principles from behavioural and health promotion theory will be given.

Tim Cable - Exercise, ageing and cardiovascular function

Leading UK researcher with interests in exercise and cardiovascular control, post-exertional hypotension and orthostasis, exercise, ageing and the peripheral vascular circulation and exercise and thermoregulation.

Free Papers include:

Effects of static stretching in warm up on repeated sprint performance

This study looks at how repeated sprint ability may be compromised when static stretching is conducted after dynamic activities and immediately prior to performance.

Measuring children's sport participation, risk perceptions and injury history: development and validation of a survey instrument

This study determines the influence of child and parent injury perceptions on sport choice and participation.

Do hard playing fields increase the risk of injury in community level Australian football?

Presently, sporting grounds are being closed due to hardness readings. The results of this study provide some evidence to challenge this.

Special Seminar on Business Skill Development

– presented by the SMA National Board Business Advisers – a lawyer, HR consultant, marketing expert and economist/finance expert.

Day Three

Major Speakers include:

Craig Purdam – Short cuts, potholes and dead ends: the race against nature in injury management

In sport, clinicians face an ongoing challenge in returning players to train and compete following injury in the shortest possible time. This paper will explore a number of legal opportunities and constraints to reducing injury downtime using examples drawn from common injuries.

Dean Robinson - Development, integration and technologies of a high performance unit

The management practices and the sports science technologies that enable Geelong Football Clubs High Performance Unit to monitor and develop the athletes to their full potential.

Susan Backhouse – Anti-doping policy and practice: state of the social science

UK expert in the development of anti-doping programs for UK Sport.

Kristiann Heesch – Qualitative methods in physical activity research – an overview

Explains how qualitative research can better our understanding of people's perceptions and beliefs about physical activity, physical activity interventions, and physical and social environments that impact their physical activity.

Free papers Include

Athletic burnout in regional, rural and remote adolescent athletes

This paper will introduce a current study that is investigating the prevalence of burnout in Australian adolescent athletes who live in regional, rural and remote areas and who are competing at non-elite and pre-elite levels.

Still want more?

The ACSMS 08 Social Program will provide delegates with a unique opportunity to network with other sports medicine professionals while soaking up the latest in sports medicine, and of course, the idyllic surroundings. The conference program has been designed so that delegates can maximise their leisure opportunities on the beach, in the pool, at the marina, on the Great Barrier Reef – or at the bar.

The social calendar will kick off on the Wednesday night with the Welcome Reception followed by the Poster Session on Thursday afternoon. The Poster Session will be a stand alone session at the conference, with discussion fueled by a complimentary drinks service. Senior members of SMA will provide feedback to individual researchers and discuss their research. Further, all poster abstracts accepted are published in the December supplement of the *Journal of Science and Medicine in Sport* and will have the chance to share in one of the four poster awards on offer, each valued at \$500.

However, the highlight of the Social Program will be the Saturday evening Conference Dinner in the Bougainvillea Marquee on the shores of Catseye Beach where delegates will enjoy local entertainment, dancing and fine food.

The ACSMS 08 Conference will surely be one to remember. So don't miss the boat on catching up on the latest in sports science and medicine...jump on www.sma.org.au/acsms/2008 to register, or for further details.

asics conference of science and medicine in sport

Hamilton Island 16 -18 October 2008



Conference Program

Wednesday 15th October	
1330 - 1500	SMA Board Meeting (Chart Room)
1730 - 1900	Welcome Reception (Main Pool)



Thursday 16th October				
Time	MR 1 & 2	Endeavour Room 1	MR 3 & 4	Chart Room
0800 - 0900	Workshop: Craig Purdam "Mobilisation techniques to augment foot function"	Workshop: Bill Vicenzino Elbow	(0730 - 0900) Workshop: CPR Accreditation	Workshop: John Banky "Dental First Aid - What's this?"
0900 - 0930	Change Over			
0930 - 1030	Free Papers: Ageing and Arthritis	Free Papers: Shoulder		Free Papers: Paediatric Exercise Science
1030 - 1100	Morning Tea (Trade Exhibition Opens)			
1100 - 1230	Free Papers: Young People and Physical Activity	Invited: Trish Wisbey-Roth "The lumbo-pelvic hip complex-The challenge of optimising intervention to maximise dynamic activity" and Free Papers: Low Back Pain		Invited: Stephen Bird "Exercise physiology: Current trends in enhancing athletic performance" and Free Papers: Exercise Physiology
1230 - 1400	Lunch (Trade Exhibition)			
1400 - 1530	Free Papers: Adults and Physical Activity	Free Papers: Achilles Tendinopathy	ASADA Session "The Role of Health Professionals in Australia's Anti-Doping Framework" and Respondent: Susan Backhouse	Invited: Michael Kellmann "Is recovery important?" and Free Papers: Recovery
1530 - 1600	Afternoon Tea (Trade Exhibition)			
1600 - 1615	Official Opening Ceremony (Auditorium)			
1615 - 1715	Plenary Keynote: John Buchanan "Jurassic Park Revisited: Research and science meets the dinosaur" (Auditorium)			
1730 - 1900	Poster Session (Endeavour Room 2)			
1930 - Late	ASMF Fellows Dinner (Barge Pier, Hamilton Island Marina)			

Friday 17th October					
Time	MR 1 & 2	MR 3 & 4	Endeavour Room 1	Endeavour Room 2	Chart Room
0800 - 0900	Workshop: Leo Pinczewski "Clinical examination of the Knee"		Workshop: Trish Wisbey-Roth "Assessment of Cycling Biomechanics to optimise performance and minimise injury"	(0730 - 0900) Workshop: CPR Accreditation	Workshop: Susan Backhouse 100% ME program
0900 - 0930	Change Over				
0930 - 1030	Refshauge Lecture: Wendy Brown "Stand up, sit down, keep moving: how much activity for a merry and bright old age?" (Auditorium)				
1030 - 1100	Morning Tea (Trade Exhibition)				
1100 - 1230	Invited: Caroline Finch "Using behavioural and health promotion theories to guide sports injury prevention and safety promotion" and Free Papers: The use of behavioural and health promotion theory to guide sports safety	Free Papers: Diabetes and Peripheral Vascular Disease	Symposium: Management of the ACL Injured Knee	Poster Display	Free Papers: Neuromechanics
1230 - 1400	Lunch (Trade Exhibition)				
1400 - 1530	Free Papers: Quantifying and describing injury risk	SMA Board Advisors Session "How to run a successful business"	Free Papers: Knee	Poster Display	Free Papers: Nutrition and Physiology
1530 - 1600	Afternoon Tea (Trade Exhibition Closes)				
1600 - 1730	Free Papers: Environments and Physical Activity	Invited: Tim Cable "Exercise, ageing and cardiovascular function"	Free Papers: Foot and Ankle	Poster Display Closes	Free Papers: Hot Topics in Neuromechanics
1930 - Late	Discipline Group Dinners				

Saturday 18th October			
Time	MR 1 & 2	MR 3 & 4	Chart Room
0800 - 0900	Workshop: Trish Wisbey-Roth "Assessment of core stability and proximal muscle function to optimise dynamic activity"	Workshop: Stephanie Hanrahan "Holistic Treatment: More than Body and Mind"	Workshop: Neville Blomeley and Brendan de Morton "Examination techniques for groin injuries"
0900 - 0930	Change Over		
0930 - 100	Invited: Kristiann Heesch "Qualitative Methods in Physical Activity Research: An Overview" and Free Papers: Qualitative Physical Activity Research	Free Papers: Sports Psychology	Invited: Susan Backhouse and Symposium: Anti-Doping Policy and Practice: State of the Social Science
1100 - 1130	Morning Tea (Asics Trade Exhibition)		
1130 - 1300	Invited: Dean Robinson "Development, Integration and Technologies of a High Performance Unit" (Auditorium)		
1300 - 1400	Lunch (Asics Trade Exhibition)		
1400 - 1500	Keynote: Craig Purdam "Short cuts, potholes and dead-ends: the race against nature in injury management" (Auditorium)		
1500 - 1530	Afternoon Tea (Asics Trade Exhibition Closes)		
1530 - 1630	"Best of the Best" Best paper winners re-present to determine Asics Medal winner for Best Conference Paper (Auditorium)		
1630 - 1700	SMA AGM (Auditorium)		
1830 - 2230	Conference Dinner (Bougainvillea Marquee)		



acsms

conference of science and medicine in sport

Hamilton Island 16 -18 October 2008

Registration Form

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Registration Fees

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Join SMA now to be eligible for the discounted member registration rate or 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 sport injury prevention and a minimum three year full time tertiary degree (or studying for a degree for student membership).

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	Early Bird Registration On or before 31 July 2008	Late Registration On or after 1 August 2008	
SMA Member - Full	\$620	\$720
SMA Member - Student [^]	\$490	\$590
Non Member - Full	\$820	\$920
Non Member - Student [^]	\$580	\$680

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

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

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

	Delegate Ticket	Additional Ticket	# Required	
Welcome Reception (Wed 15 October)	\$nil <input type="checkbox"/>	\$60 <input type="checkbox"/>
ASMF Fellows Dinner (Thurs 16 October) [^]	\$60 <input type="checkbox"/>	\$60 <input type="checkbox"/>
Conference Dinner (Sat 18 October) [^]	\$nil <input type="checkbox"/>	\$100 <input type="checkbox"/>

[^]Ticket includes food and entertainment only - drinks to be purchased separately

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A SLAP on the shoulder

If you follow the popular press in US sports, you'd be excused for thinking that throwing athletes attract SLAP lesions like dogs attract fleas. Well, maybe they are not that common, but increasingly SLAP lesions are being seen as an almost 'essential' lesion of the athletic shoulder, so it serves those of us who see injured throwing athletes well to be familiar with the presentation, pathology, contributing factors and rehabilitation of these athletes.

There is a growing body of thought that a significant early symptom of a superior labral lesion from anterior to posterior (SLAP) lesion will be a sense of lost throwing velocity—a symptom that both the athlete and the coaching staff will be immediately and acutely aware of. It is worth noting that often the athlete will describe this as a 'dead arm'. Those of us who more commonly deal with impact sports can mistakenly interpret this as a sign of frank shoulder instability, and it pays to clarify this with the athlete in some detail. Rarely, if ever, will the athlete describe signs or symptoms of true instability (shoulder 'popping out' or true neurological deficit in the upper limb).

Pathology

The SLAP lesion was first described by Snyder, who further sub-defined his original series of 27 subjects from a retrospective review of 700 arthroscopies into four subtypes. This classification system has been further refined (delineating three subtypes of Type II SLAP lesions) and extended to include an increased variation in SLAP lesion types such that there are now at least an unwieldy 10 types of SLAP lesion described, which doesn't include subtypes. I'm entirely incapable of recalling the vagaries of these evolving subtypes, and in a practical sense I now consider SLAP lesions by their essential manifestation: an incompetence of the

articular fibrocartilaginous extension of the insertion of the long head of biceps. For an elegant description of the anatomy of the labrum of the glenoid, and its relation to the long heads of the biceps and triceps, the interested reader is directed elsewhere. In short, however, the circumferentially placed fibrocartilaginous labrum is the intermediate structure between the tendons of the long heads of the biceps (superiorly) and triceps (inferiorly) and the insertion of the fibres into the scapula.

The essential thing to understand then is that a common mechanism of failure of this insertion is a tensile overload of the associated tendon wrenching the attachment from the glenoid. This can occur in a number of ways, but in throwing athletes it is thought to be associated with the extremes of shoulder rotation regularly displayed during their sport. At first this may seem incongruous if you thought the main role of the long head of the biceps is in elbow movements; however, if you recall that the proximal long head of biceps is relatively trapped in the bicipital groove between the greater and lesser tuberosities then you can envision that humeral rotation will then place a marked increase in tension between the glenoid origin and the initial few millimetres of tendon during rotation of the humerus. Any translation of the humerus away from the centre of the glenoid can then change this tension on the origin.

Traditionally, the translation associated with perceived instability in the throwing shoulder has been suggested to be antero-inferior; however, as alluded to above, there is a growing body of thought that this may not be the case. The incidence of shoulder pain in the throwing athlete is very high; if a significant subset of this shoulder pain were being caused by some degree

of anterior translation in the cocking or acceleration phases of throwing, then surely at least some of these individuals would be unlucky enough to have their shoulder progress from a subtle anterior instability to a frank dislocation. However, the incidence of anterior instability in the throwing arm of these athletes displays the opposite, with a marked reduction in frank anterior instability in throwing arms in comparison to non-throwing arms. Clearly there is some systematic effect going on here, but it is not anterior translation.

Another body of work suggests it might, in fact, be a postero-superior translation that is a more common occurrence in throwing athletes. The genesis of this is a tightening of the posterior inferior glenohumeral ligament, probably due to an abbreviated follow-through phase, or an insufficiency of the deceleratory musculature increasing the load on the passive elements such as the posterior capsule. The influence of throwing mechanics on pathology and performance in these athletes is hotly debated and a long way from being resolved; however, the interested reader is directed to a review of these factors which are useful to address during rehabilitation. Therapeutically, the implications are that an improvement in the strength of the external rotators will assist in reducing the load on the posterior capsule during the deceleratory phase.

Interestingly, I have now collected a series of close to 1000 consecutive measures of isometric break force for internal and external rotation (measured by the side), and those with SLAP lesions regularly display a marked reduction (>1 S.D. from average strength ratios) in their external rotation strength. I have had several subjects who have had their cuff strength measured and in the subsequent two years have been unlucky enough

to suffer a throwing-related SLAP lesion—they, too, had a similar reduction in external rotation strength. Such small numbers make for a statistically invalid leap of faith to suggest that it is the external rotation weakness that caused the SLAP lesion, but combined with the proposed mechanism described is some kinetic evidence that suggests improved external rotation strength reduces harmful loads at both the shoulder and elbow of throwing athletes.

Also of consideration here is the finding that a SLAP lesion is regularly associated with a collection of oedema in a pouch superior to the glenoid, which can directly impinge on the course of the suprascapular nerve, thereby further reducing the integrity of at least the infraspinatus muscle which it subsequently innervates. Of concern is that due to the lack of a cutaneous distribution, the motor loss may be the only sign of such an injury.

Tightening of the posterior capsule has previously been implicated in the genesis of shoulder pathology, but subacromial impingement and the tight posterior capsule has shown to be associated with a superior migration of the humeral head. The cadaveric evidence certainly showed this, but it was during passive forward flexion that this occurred, and some of us had mistakenly extrapolated this to all shoulder movements, including the cocking phase where abduction and external rotation occur. The suggestion is that during the extreme shoulder external rotation displayed during the cocking phase of throwing (up to 210° of external rotation have been recorded), the posterior capsule ends up antero-inferior to the glenoid, and if this capsule has been significantly thickened and tightened the resultant translation at the glenohumeral joint is postero-superior. The net result is now a double whammy of tension on the proximal long head of the biceps and its associated investment in the superior labrum—first, by the humeral rotation, and, second, by the translation associated with the capsular thickening. This also helps explain the reduction in anterior instability incidence as the posterior capsular tightening will thus be protective of this.

Rotational range of motion

When discussing shoulder rotational range of motion (ROM), a couple of related concepts are important to keep in mind. First, rather than passive shoulder external or internal rotation range per se, the important concept is the total rotational ROM, or the sum of these two values. For any given individual, these are thought to be constant from side-to-side, but the same cannot be said for between individual comparisons. While this averages to about 180°, the variation is large (the highest total rotational ROM I've seen was 270°). Throwing athletes with tightening of their posterior capsule will usually have a reduction of internal rotational ROM associated with this, and restoration of these ROM losses is associated with a marked reduction in the incidence of SLAP lesions in these athletes. Second, humeral torsion is a confounder that must be considered. It turns out that the amount of twist about the long axis of the humerus (the 'humeral torsion') will effectively 'shift' this rotational ROM. So if an individual has a 15° retrotorsion increase in their dominant arm, then you should expect to find 15° more external rotation and 15° less internal rotation ROM when you assess. Confusingly in my opinion, the US literature continue to separately refer to lost internal rotation (Glenohumeral Internal Rotational Deficit or 'GIRD') and an increase in external rotation (External Rotational Gain or 'ERG') which are viewed in isolation from humeral torsion. Perhaps, though, it is only confusing to me as I find the notion of a total rotational arc of motion more intuitive where the arc is shifted by the difference in torsion, and then real differences in internal and external rotational range are obvious. Of great clinical use from these papers is the finding that losing 25° or more of total rotational ROM to be associated with a significant increase in the incidence of SLAP lesions, thereby giving clinicians a useful clue for screening purposes and some direction to their immediate treatment aims. The average side-to-side difference for humeral torsion in throwing athletes is about 13° but the range is large: our series of over 200 throwing athletes has shown a variation from 48° retrotorsion increase to 30° retrotorsion decrease—almost 80° range. Clearly such a difference will need to be accounted for

in restoring rotational ROM, and while we have no reliable way of predicting the order of magnitude of these changes according to the thrower's playing history, anthropometrics or kinematics, we now have a non-ionising method of reliably measuring this value.

Clinical assessment

The clinical assessment of SLAP lesions has had a chequered past. Some of the early examination techniques were hampered by an incomplete understanding of the normal anatomy of the biceps origin at the time, from which arose inaccuracy when comparing to arthroscopic examination.

The initial analysis of any reported physical examination technique needs to be tempered by the light of subsequent analyses of the same technique performed by different investigators. The outstanding Likelihood Ratios described by O'Brien's initial report of the Active Compression Sign were cast aside when subsequent investigations reported a less rosy picture. Unfortunately in this case, O'Brien and colleagues would have cause for objection when papers investigating this sign don't perform the test as it was originally described, and then conclude that the test is of little clinical utility. Further review papers will often state performance of O'Brien's Active Compression Sign in their abstract, but a more careful perusal of their methods shows a different test being performed than that which was originally described. It benefits all of us to be accurate in our examination technique and reliable to the original description if we're trying to make inferences from the original work. That said, there are now a number of techniques available to the clinician, along with O'Brien's Active Compression sign, showing promising predictive ability, such as the Crank Sign, the Biceps Load II, the Resisted Supination External Rotation Test, and the Passive Compression Test. The true utility of these techniques will be clearer when all these tests are performed prospectively by a second group, and this is something we should all be eagerly awaiting.

In summary, a SLAP lesion should be suspected in the athlete who presents with an unexplained loss of throwing velocity. The index of suspicion would

rise if a true reduction in internal rotation ROM is found once their humeral torsion is accounted for, and probably more so if a relative reduction in their external rotation strength (in comparison to their internal rotation strength) is found. Conservative rehabilitation would involve addressing these strength and flexibility deficits, along with their throwing volume and throwing mechanics in concert with their coaches. If this were to fail then surgical intervention would be warranted, otherwise the outcome is not good in the throwing athlete—surgery followed by appropriate rehabilitation seems to have a good clinical outcome.

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By Rod Whiteley, Specialist Sports Physiotherapist

John Orchard is a Conjoint Senior Lecturer at the University of New South Wales

Correspondence: johnorchard@msn.com.au

Dr Hugh Seward is President of the AFL Medical Officers Association



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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 Convention Centre, Hamilton Island on Saturday 18 October 2008 at 5.00PM.

Agenda

- | | |
|---|-------------------------------------|
| 1. President's Welcome | 2. Roll Call, Apologies and Proxies |
| 3. Minutes of the Previous AGM | 4. Reports |
| 5. Financial statements & audit report | 6. Board Election (if required) |
| 7. Appointment & remuneration of auditors | 8. Special Business |
| 9. Close | |

Call for Nominations – Board of Directors

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

National Directors for:

- | | |
|--------------|------------|
| • Queensland | • WA |
| • ACT | • Tasmania |
| • Victoria | • NT |

I _____ of _____

hereby nominate _____

for the position of _____

on the National Board of Directors of Sports Medicine Australia

Proposer's Signature _____ Date _____

Seconder (full name) _____

Seconder's signature _____ Date _____

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

BY NO LATER THAN 5.00 PM (EST) ON Friday 26 SEPTEMBER 2008

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.