

Sport Health

Incorporating The Bulletin



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

Publisher

Sports Medicine Australia
PO Box 237 Dickson ACT 2602
Tel: (02) 6230 4650
Fax: (02) 6230 5908
Email: smanat@sma.org.au
Web: www.sma.org.au

Circulation: 5000
ISSN No. 1032-5662

Editors

John Orchard
Kerry Mummery

Managing Editor

Dominic Nagle

Chief Executive Officer

Gary Moorhead

Subscription Manager

Joyce McClune

Advertising Manager

Dominic Feenan

Design/Typesetting

Levitate Graphic Design

SMA STATE BRANCHES

ACT

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

New South Wales

PO Box 724, Glebe NSW 2037
Tel: (02) 9660 4333

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

1st Floor, 120 Jolimont Rd, Jolimont VIC 3002
Tel: (03) 9654 7733

Western Australia

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

SUBSCRIPTION RATES 2003

Australia A\$35
Overseas A\$50

SMA members receive Sport Health as part of their membership fee

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

PP No. 226480/00028

For subscriptions contact Joyce McClune
Phone: (02) 6230 4650
Email: smanat@sma.org.au

Contents

FROM THE CEO _____ 2

Finging a balance

DR J _____ 4

The paradigm change needed on inactivity

ABOLISHING STUDENT UNIONISM _____ 7

The baby going out with the bathwater?

ROUND TABLE _____ 8

Specialist training: Is sport psychology the tip of the iceberg?
Peter Terry with Kerry Mummery

SINGLE SEX NETBALL: THE CONTINUING DEBATE _____ 10

Geraldine Naughton and John Carlson

CRICKET AUSTRALIA INJURY REPORT 2004 _____ 15

John Orchard and Trefor James

THE BULLETIN _____ 25

Cover photograph: Australian Sports Commission



Finding a Balance

By Gary Moorhead

Many situations arise for sports medicine and science practitioners – and for SMA – where it is necessary to find the right balance when dealing with conflicting or competing issues. What follows is a brief discussion of a number of areas that have arisen recently where SMA or SMA members may face a difficult choice in finding the right balance when choosing a particular course of action.

Appropriate remuneration

For example, last month the SMA National Board endorsed the Australian Physiotherapy Association (APA) Position Statement on payment for professional services. The Position Statement recommends that APA members “should be paid appropriately for all professional services rendered” and are “entitled to payment at prevailing market rates”. The other Discipline Groups involved in sports medicine and science (covering sports physicians and doctors, podiatrists, dietitians, psychologists and sports scientists) also endorsed the Statement.

The President of the College of Sports Psychologists (COSP), Professor Peter Terry, provided the only discordant note to this multidisciplinary show of unity. His enthusiastic endorsement of the Position Statement on behalf of the College of Sports Psychologists (COSP) was followed by the statement: “but when I’m working as Psychology Coordinator at the Queensland Academy of Sport, I’ll only be paying staff what the budget will allow.”*

Not surprisingly, this assertion provoked some fairly vigorous discussion at the meeting, but it encapsulates one of the dilemmas of the profession: how to find the appropriate balance between what is appropriate payment and what are appropriate circumstances for volunteering one’s services or working for lower rates?

The APA Statement notes that “volunteering one’s service ... may be considered where there may be a substantial non-monetary benefit to the member” and specifically instances the Olympic and Commonwealth Games. Yet when SMA recently distributed the call for volunteers to work at the Commonwealth Games, even this provoked responses from members unhappy that SMA was encouraging members to “sell-out” their professional status by working without payment.

Assessing what is appropriate “non-monetary benefit” can lead to very differing opinions. Tasked with the view that offering low pay rates would mean he could only recruit from the lower ranks of the profession, Professor Terry maintained: “I get the best: everyone wants to have work at an elite institution like the QAS on their CV”.

What price experience?

For beginner practitioners, any exposure to sports medicine can help build skills and contacts. Current SMA Queensland Executive Officer and APA Sports Physiotherapist Titleholder Mark Brown recalls working for Eastwood Rugby Union Club in Sydney in 1985 for an annual retainer that amounted to just \$1.18 an hour. But, for a recently graduated physiotherapist working in a public hospital, the financial remuneration was nothing compared to the experience and knowledge gained and then later the opportunity to develop referral networks to his practice. The debate over the balance between the value of knowledge gained through training and endorsed by qualifications compared with knowledge gained through experience in the field will probably be with us forever.

There is no doubt that service in elite sport is the crowning achievement of a sports medicine practitioner’s

curriculum vitae. But elite sport medicine recruitment is not always based on what sports medicine practitioners would regard as merit. Most elite sport operates under the financial constraints described by Professor Terry. Many members have experienced the aggravation of having their service in elite sport undercut by a competing colleague offering the same service at a lower rate. To the person prepared to take the lower rate, the CV outcome – or the increased marketability deriving from service at the elite end - is worth far more than the payment received.

One formerly prominent SMA identity confessed his decades long career in elite sports medicine came as a result of forgetting to include a fee on his initial job application. This gave him an economic edge over other applicants and the position with the team.

Some large sports medicine practices have used sporting clubs’ search for the cheapest option as a way to promote their practices. The practices offer clubs a full suite of sports medicine support services through their practices at a discount, not just saving clubs money but also providing at one stroke the services of the full range of sports medicine practitioners required by the club. For these practices, the pay-off is elite team association for the practice and, by association, for all practice staff.

This approach has been so successful for sports medicine practices in some states that country-based SMA members complain of patients prepared to drive for hundreds of kilometres to the city for treatment in the elite sport associated-practices rather than by their home town practitioner. Never mind that the hometown practitioner might have qualifications and years of experience over the recent graduate who might be providing the service in the city practice. In the patient’s mind, the elite sport association outweighs all this.

Patient privacy versus media interest

Providing services in elite sport brings a whole range of additional “balance” issues. One of the most difficult is the intense public scrutiny that can be applied to members’ work. Historically, medical issues are held to be matters private to the patient and the medical practitioner or health service provider. But in elite sport, medical issues are one of the main areas of media interest and scrutiny. It is now media legend that the most reported story in Australia from the Athens’ Olympics was “Jana Pittman’s knee”. On the sports pages, injury and fitness stories now compete with match reporting and along with tribunal stories, are the main “between game fillers” for all media.

While “sports medicine reporting” has been embraced with gusto – and, it must be admitted, style - by some sports medicine practitioners, for many others involved in elite sport, finding the balance between patient care and media demands must be close to a nightmare.

Caffeine

The recent “caffeine controversy” has been a classic case in point.

Before issuing our public statement on the matter (see www.sma.org.au/media) SMA discussed the issue with senior medical officers from the two major football codes, with the Australian Sports Drug Agency (ASDA) and also reviewed the matter or received input from a number of other SMA members in senior medical positions in elite sport. The initial “balance” concern was with being seen to make a stand on the issue but, by so doing, potentially feeding media interest in an issue that would probably have been best served by quickly disappearing from view. The decision to issue a statement was eventually taken because of the potential for harmful copycat practices at a community level.

However, even here we probably got the balance wrong because in trying to sound discouraging about caffeine use, we understated the actual benefit of caffeine to the athlete. Again, this was a balance issue because we

took all our advice from medical practitioners and none from scientists. Dr David Bishop, the President of the Australian Association of Exercise and Sports Scientists (AAESS), soon made us aware of this error.

Dr Bishop agreed with the broad thrust of the SMA position, but drew to our attention that the part of the SMA media statement that said “... the performance effect is very, very small” was contrary to research he and others had conducted in WA with elite athletes.

According to Dr Bishop the researchers “found very large (7-10%) and significant improvements in repeated-sprint performance during a simulated team-sport game (2 x 40 min halves) following a caffeine dose less than what most people ... probably consume in a normal day”(1). Interestingly, he went on to say “research has shown that there is not a linear dose response effect between caffeine and performance, rendering excessive use of caffeine futile (although certainly possible amongst athletes who think more is better)”.

Dr Bishop’s take on the issue was that, while it is important to send the correct message to community level sport, SMA should use all the Discipline Groups to ensure that its messages are based on research from the collective wisdom of all disciplines.

The problem with meeting this reasonable stance is contained in the words “to ensure”. In this case, the balance issue is simply one of timing. The media work to set deadlines and expect a response to issues in time to meet those deadlines. This is why SMA uses a number of spokespersons for different issues. These spokespersons have to balance the need to make media comment on behalf of SMA against the demands of their own professional lives (comment is invariably needed during business hours or very early in the morning) within media deadlines.

Getting research outcomes into practice

The other balance issue arising from the caffeine issue is clearly one of information dissemination. While the research outcomes from the trials involving Dr Bishop were very clear in terms of dosage levels and performance outcomes, it does seem from the reporting of the issue that many athletes or team staff were unaware of the results of the research. The research results were presented at the 2004 AAESS conference and are currently under review pending publication. Given the recent furor, one could question whether this was sufficient dissemination of such clear-cut research outcomes.

Researchers in sports medicine and science produce and publish or present vast quantities of information. Much of it is fairly arcane, but much is obviously of immediate relevance to clinical practice. The system to which academic researchers are bound means that usually this research is “held back” until formal publication. What makes this even more of a possible “balance issue” is that academic researchers are hounded to get their work published in publications with a high impact factor. This may mean even longer delays as work is submitted, reviewed, possibly rejected and resubmitted until eventual publication. It is possible that, the more cutting edge the discovery, the more likely it is to be held back – for maximum publication kudos or to ensure adequate patent protection for later exploitation.

*** In defence of Professor Terry, it must be said that, in circumstances when the budget does allow, he will pay professional staff as much as he possibly can. Staff who have worked for Professor Terry at the QAS were at pains to stress his creativity in finding ways to make restrictive budgets stretch to increase payments to staff.**

Reference

1. Schneiker T, Bishop D, Dawson B. The effect of caffeine ingestion on repeated-sprint performance. Inaugural AAESS Conference, Brisbane, Australia, 2004.

The paradigm change needed on inactivity

By Dr J

The phrase “it’s the economy, stupid” was made famous during Bill Clinton’s 1992 Presidential campaign and it seems to be very much a truism today in Western countries. Basically the logic behind this slogan is that, if the economy is cruising along well, enough swinging voters will be happy with an incumbent leader to vote him back in but, if it is struggling, an opposition will probably have enough momentum to bring the government down. If a country is in recession, the blame gets well and truly pointed at the man in charge, rather than it being seen as a problem caused by the collective stupidity of the nation’s businesses and individuals.

The fact that the public is so willing to blame the government of the day for a bad economy (even when a recession might happen for reasons beyond government control) is a good thing in terms of keeping the government fiscally accountable. The downside is that there are many other important things going on in people’s lives than their financial well being, which the government can influence but for which it is rarely held accountable for. We live in a much wealthier society today than that of 30 years ago yet, where statistical measures can be made about happiness, we are neither more nor less happy than we were 30 years ago. Also, statistically, richer people are happier than poor people yet as a richer society we aren’t any happier than in the past. It seems that, while we have become wealthier, our quality of life has declined in ways which have reduced it by as much as the extra money has improved it.

A list of ways in which our quality of life may have become worse (for the average member of the community), many of which are inter-related, would include: (1) the increase in the rates of divorce and children being brought up by single parents; (2) the decline in the actual number of children

because of declining fertility; (3) the decline in the exercise that people are doing; (4) the decreased perception of personal safety; (5) the increase in the number and size of cars on the road making more noise and spitting out more pollutants than ever; (6) the increase in the number of business and personal interactions that the average person has along with a corresponding decrease in personal connection involved in those interactions; (7) I don’t have to keep going, you can add a few more here of your own. Apologies for how I phrased point (6), but I wanted to bundle in something about how much worse life is because people don’t have nearly as much connection with each other any more. The tradesperson who does work at your house is now different every time, you never seem to get to speak to the same person twice in any business you deal with (eg, your bank), you spend half your time reading emails and receiving letters from people you don’t actually know.

Number (4) is interesting as apparently crime hasn’t really increased that much (if at all) over the past 30 years but, because we hear and see media broadcasts of crime almost incessantly, we have become paranoid about walking the streets at night and living in dwellings on the ground floor, etc. An interesting analogy to this is that we should all be much happier now than we were 30 years ago because medical science has advanced so much; yet in terms of satisfaction it has been almost completely cancelled out by the increase in expectations of the health professions. We have much better ability to make a correct diagnosis in medicine, for example, yet patients are now livid if the correct diagnosis wasn’t made 10 minutes after the initial presentation, whereas 30 years ago there was more error in medicine but far more acceptance of error. The fact that our health is better hasn’t seemed

to make us any happier.

Thanks for indulging me in 700 words of introduction, as the point of this column is to focus on our favourite topic of the moment which is the lack of exercise in the community. We know that people doing regular exercise are happier, that most people actually know this and that almost anyone can exercise, yet people are doing less exercise than ever. Why is this so? If we were surveying 100 people (a la Family Feud), the top answer, with, say, 82 responses, would be that “people are lazy”. Second top answer, with 16 responses, would be that “people don’t have enough time to exercise”. Unfortunately no one would think to answer “the government has provided too many disincentives for people to exercise and not enough incentives”.

I am fascinated by the fact that, when the current account deficit blows out, people blame the government (and not individual spending habits); yet, when the stomach of the average person blows out, people blame individual eating and exercise habits (and not the government). OK, in certain circumstances, individuals have tried to blame someone else for their obesity (like the people who tried to take out a class action against McDonald’s) but most of the time we point the finger at fat and inactive people and blame them for their own predicament.

I definitely don’t want this column to be an excuse for people who eat too much and who exercise too little to blame it on the government. What I want (and this is what I mean by paradigm shift) is for the government to become accountable for more of the things going on in our society than the economy. Such as the average amount of exercise that people are doing, such as the number of divorces in society, such as the size of cars on our roads. Because I believe the government

actually can affect things like the amount of exercise that people do and the amount of junk food that people eat, etc.

What’s that, you don’t think that it can affect these sorts of things? Well what about the fact that, when they brought the GST in, they made fresh food GST-free but packaged food GST-liable? Wasn’t this a good move? The answer is that it was a very good move, and it almost certainly contributes a degree towards healthy eating, but it doesn’t really go far enough. Why is there the same GST on a salad at McDonald’s and a Big Mac at McDonald’s? Obviously the answer the government would give is that it is simpler to comply with a flat-rate GST (ie, it makes economic sense). It just doesn’t make sense if you were a government who was getting scored on whether people had healthy diets.

Why is there community rating for private health insurance (meaning that everyone pays basically the same premiums)? Again, the government line will be that it doesn’t want to discriminate against people who have chronic illnesses, and it wants to keep the system as simple as possible. But this effectively means that there is a government subsidy in the private health system for cigarette smokers, for people who don’t exercise and for people who are overweight -- and a government penalty for non-smokers, for exercising individuals and for those with normal body weight. This is because, if the insurance companies had their way, they would penalise smokers (after risk rating them) and penalise people who were overweight. They would also probably penalise people who played either no sport (or very high risk sports like football) and give lower premiums to people who regularly run, swim and cycle.

The government line that exceptions shouldn’t be made with tax and levies and the like breaks down very quickly when you try to mark them on some of my previously mentioned measures of societal well-being. For example, the import duty in Australia on most passenger cars is 10% but the import duty on 4-wheel drive vehicles is 5%. A simple system would have its merits, but how can you justify differential rates of import duty which actually encourage people to buy the less safe, less environmentally-friendly option?

What if you want to visit a doctor under Medicare, what kind of rebate will the government pay you? Obviously the system could be ‘simple’ and the same rebate paid for the same length consultation for every type of doctor. Maybe this wouldn’t be ‘fair’ though. For example, surgeons can make lucrative amounts of money (much of which is subsidised by health insurance) from operating, so perhaps it is fair that patients of physicians deserve higher rebates from their consultations than the patients of surgeons. Psychiatrists can legally see more than one patient at the same visit so, when this happens, it is perhaps fair that each patient receives a lower Medicare rebate.

Why is it that patients of sports physicians receive lower rebates than any other recognised doctors in the Medicare system (Table 1)? In 1998 the Howard Government recognised that the ACSP had appropriate standards for training and registering sports physicians, yet since then it has kept payments to sports physicians equal to or lower than all other recognised doctors. If you ask the HIC or Health Department why this is the case, their only answer is a sentence that does not make any sense, such as “the sports physician rebate is lower than the GP rebate because sports physicians work in a specialised area; but the sports physician rebate is lower than the specialist rebate because sports physicians aren’t specialists”. I know anyone reading this would think that this statement came from George Orwell’s 1984, but this is actually the official Health Department reason why sports physician rebates are so low compared to other doctors’. Perhaps a more truthful reason may be that the relative values of various doctors were determined in the actual year of 1984,

Table 1- Medicare rebates for 30 minute consultations in the office with various doctors

TYPE OF DOCTOR	MEDICARE REBATE FOR HALF-HOUR INITIAL CONSULTATION IN OFFICE
Consultant physician (including cardiologist, endocrinologist, rheumatologist, occupational physician, rehabilitation physician)	\$108.85
Psychiatrist	\$62.40
Surgeon	\$61.75
VR-General practitioner	\$58.55
Sports physician	\$49.80

» Continued on page 14

Student Unionism

Abolishing compulsory student unionism The baby going out with the bathwater?

The Australian Government is clearly intent on pursuing its policy to abolish compulsory student union fees. But -- as the saying goes -- "everything is connected to everything else". What seems to be a good idea about education in Canberra can have unhappy consequences in apparently unrelated areas such as public health elsewhere.

Sport Health publishes here SMA's media release of 18 March in which SMA President Marilyn Feenstra and **Sport Health** Editor John Orchard express their alarm at an important implication of this policy.

SMA's reaction is not because it has any interest in defending the political activities of many student unions but because of the harm the policy may well do to university sport and all associated with it -- and, in the longer run, the ramifications for our attempts to help deal with sedentary behaviour and its spin-offs overweight and obesity, which is a huge health problem facing Australia today.

SMA has received letters from members who have disagreed with aspects of the SMA media release on this issue, partly because it is said that they lead SMA into political waters and partly because the issue should not be more than a peripheral issue for SMA members.

Sport Health respectfully disagrees. As Ms Feenstra said in her media release, the policy "will be terrible for sports participation". And sports participation has a central role in community physical activity and exercise.

Sport Health publishes here the SMA media release, some comments by one prominent SMA member which best sum up critical members' reaction and the Editor's response to these comments.

I would like to make comment about the John Orchard comment made on behalf of SMA. I think that we have to be very clear about what we are saying. I agree about the issues of sport and obesity, but I am also very clear about issues as they relate to compulsory unionism.

I believe that attacking the Minister for this decision does nothing to separate the issues. Proper funding for sport and recreation at universities is one matter, but the abolition of compulsory unionism is a necessary and, I believe, constitutionally necessary step. Part of the monies taken from students in a compulsory manner are sent to political parties without the consent of the students and may be contrary to their beliefs.

Rather than criticising, I believe that SMA should be helping ensure the continuity of funding for sports and recreation by lobbying Government in a positive and constructive way. I believe that governments do take note when constructive, solution-based information is brought to their attention, especially when there are unforeseen consequences of their own

actions. Confrontation tends to lead to a belligerent reaction

I want to make the point that we are lumping all things into one. In Western Australian universities, there has been a demarcation between union/guild fees and an amenities fee that have been part of the enrolment process for some time. I feel that the Federal Government's zeal to prevent compulsory 'unionism' by making union fees voluntary has produced a wholly undesirable result.

In WA, this would have been totally unnecessary. The amenities fee could and should have remained as a fee, as it was used to service sporting facilities as well as food outlets, etc. The Government could have just made guild fees voluntary as I believe that this would achieved its desired outcome. Compulsory unionism is an issue and relates to people's rights to support (or not) their own choice of political party. To have compulsion and then no control over where that money goes is an issue for many students and, obviously, the Federal Government.

It is true that the decisions concerning voluntary fees is going to have a major impact on facilities in the university arena. The way that this is happening is wrong, in my view. With respect to this, I fully support the SMA statement. That there is a viable alternative to doing this (such as the separation of guild fees from amenities fees) is the issue that I feel needs pushing. My comments concerning the SMA statement is that it was a negative criticism of government policy without any constructive comments concerning alternatives. Lobbying for a model such as is written above would be wholly supported by me and, I assume, all SMA members. To berate the Government concerning abolition of compulsory guild fees without discussing the reasons for this makes the SMA sound as though it supports compulsory unionism. This tends to imply that SMA is party political. I would not support SMA having this role.

Dr Gavan White
Synergy Sports Medicine
Margaret River, Western Australia

Student unionism

The Editor responds:

I am glad as always to get feedback and to have raised an issue which leads to debate.

It has to be admitted that, since I work at a sports medicine centre at a university, I am close to the action and have many connections with people in the Sydney University sports union who are very distressed. I also have a bit of a conflict, in that the practice at which I work derives business from a vibrant sports scene at the university -- although with respect to funding it is paying rent to the university sports union rather than using up any student money. Nevertheless, with an objective hat on, I think there is very little that should worry SMA about its stance on this issue.

Basically, I haven't seen/read/heard of a single opinion in favour of what the proposed legislation will do to university SPORTS facilities and programs.

I agree that there are many who dislike the principle of compulsory membership of political bodies, and this is the rationale for the Government proposing the legislation. However, it seems to be throwing the baby out with the bath water the way it has framed the legislation. Sports unions, even though they are a 'union' in name, are not political bodies. Students who pay their sports union fee (currently as part of their compulsory payment) are paying for the building and upkeep of cricket and football fields, gyms, and other university sporting facilities. None of the SPORTS union money is going towards anyone spray painting graffiti.

Virtually anywhere else in Australia major sporting facilities (eg, ovals) are maintained by taxes or compulsory levies (eg, council rates). I can't think

of an example, other than perhaps the few professional teams that own their own grounds, where a user-pays system operates. Sure, some lesser sports facilities such as private gyms may be completely user-pays but charge fees that are generally out of the reach of student budgets. Even swimming pools rely on government or council grants to be built and can't be funded completely by casual swimmers paying \$3 per swim.

At the moment, compulsory student fees allow greenkeepers, etc, to be employed to maintain university sporting ovals. Who is going to fund the upkeep of the ovals if the universities can't charge a compulsory fee? If there are 50 active footballers and 50 cricketers who use an oval each year, between 100 they might need to pay over \$1000 each to upkeep the oval. When all are not willing to cough up the money, the greenkeeper gets made redundant, the grass grows to a foot long, and no sport gets played on the oval.

(NB. The way the legislation is framed, universities will NOT be able to collect money from students (other than voluntarily) for sports facility upkeep and will NOT be able to divert money from academic programs to pay for non-academic expenses. Basically if the sports unions can't raise enough money from users, facilities have to close.)

While there are some facilities such as gyms and swimming pools that might be debt free with lowish upkeep that could theoretically revert to user-pays, some of them have been funded by loans that were budgeted for with sports union payment projection. If the payments cease, they may go into receivership because the sports union can't service the loan. If a receiver walks in, they might want to sell the

swimming pool land to McDonalds to pay the creditors.

So far the government has not come up with any plans to keep sports unions afloat. If bodies like SMA say nothing, perhaps the Government will do nothing further and may even end up letting sports unions go to the wall, all for the sake of an ideological problem it has with student politics.

Obviously, it would be a tragedy if sporting facilities simply closed down, but it is completely not scaremongering to say that it could happen. SMA most definitely has a responsibility to raise the issue in the media and push towards some sort of compromise proposal between the Government and sports unions to make sure this doesn't happen. Perhaps the Government might step in and fund the sports unions directly, which would be great if it happens.

SRCs at universities may well have their own problems with how they are going to maintain their funding, but SMA did not make any statement on them, and we all agree nor should it have. But SMA should definitely raise the flag about anything that could lead to a possible closure of sports facilities, at a time when not enough people are playing sport.

John Orchard

Specialist training programs: Is sport psychology the tip of the iceberg?

What is the status of sport psychology training in Australia? Peter Terry, Professorial Research Fellow in the Department of Psychology at the University of Southern Queensland and National Chair of the Australian Psychological Society's College of Sport Psychologists, discusses this question with Kerry Mummery, Editor of Sport Health.

Sport Health: Peter, recently the issue regarding the closure of some of the clinical masters programs in sport psychology has been raised. To begin can you update our readers on the current standard and status of sports psychology training in Australia?

PT: Australia is regarded as the benchmark around the world for sports psychology. Training programs in Australia are the most thorough and best in the world. Every sport psychologist in Australia is a trained psychologist first and then a specialist in sport second.

Typically people coming into the program would have concluded an undergraduate degree in psychology followed by an honors degree in psychology, gaining relevant skills. They would then complete a two year Masters program or a three year Doctorate program. During the course of their training they would take advanced courses in sports psychology, which would include relevant theories, applied skills and professional practice issues. And those professional practice issues are dealt with in a more general sense.

The great thing that comes on top of that is that they get to do 1000 hours for the Masters or 1500 hours for the Doctorate of practical experience under close supervision. Typically they would do their first practical experience on campus at the psychology clinic, or student services or sports psychology clinics. So they would be working on campus with

close supervision and usually they would have one hour of face to face supervision for every eight hours that they are working and this would gradually decrease as they became more independent. For their second practical they would be out in the community with a local sports club sometimes with an Institute of Sport if they have close affiliations as we have with USQ. The third practical may be something similar with another organisation. Some people go to work in a hospital which is more clinical oriented training. After the 1000 hours, they come out very well skilled. As a result of this training you have people coming out who are very prepared for the profession.

When I think back on my training, I wish I had done that because it is just such a great preparation. So when they do finish they automatically get selected by a national or state institute of sports around Australia or overseas. Not only are there career prospects but there is a great capacity to assist Australian sport, so it is really advantageous from day one.

SH: The closure of the programs domestically coincides with the attainment of an excellent reputation world-wide in terms of specialist preparation; can you comment on that?

PT: The success of the Australian team at the Sydney and Athens Olympics cemented Australia as the place that makes the most of its sporting ability. We have small numbers and

lots of medals. We must be doing something right and all of the sports science and sports medicine support are being held as the gold standard around the world. Australia has been granted the World Congress of Sport Psychology this year in Sydney by the International Society of Sport Psychology, a big acknowledgement of our standing on a world scale.

The irony is that, at the time when the reputation of Australian sports psychology has never been higher, two of the four specialist programs have been closed, with the other two under constant threat. Historically, programs have been offered at the University of Southern Queensland, the University of Queensland, University of Western Sydney and Victoria University. Two of those - USQ and UWS - have now closed and the program at UQ has come under threat. It is a tragedy that the reputation of excellence that has been built up has now been passed aside for reasons that have nothing to do with the interest of Australian sport; they have to do with education.

SH: By education, you mean a movement towards economic rationalism in the tertiary education sector?

PT: Exactly.

SH: How is this a threat?

PT: There is no doubt that there is a wave of economic rationalism that is

sweeping through our universities.

In previous times, the specialist masters programs would be effectively cross-subsidised from the income of the undergraduate program. A large number of undergraduates and small number of postgraduates is okay if we look at the overall picture as it's fairly healthy economically. But, if we look at what is happening now, each program is being scrutinised and costed completely independently so our masters and doctoral programs are being costed separately from our undergraduate program and also separately from one another.

If you have a program that takes in six students a year - and I'd like to point out that Australian universities have been ethical and are not taking in large numbers of students if they do not feel there is a job market out there for the graduates - when you cost it all individually and when you take into account the one-on-one supervision that is required for the practical and for the research experiences, then the numbers aren't very good at all. In fact, on paper, we are losing about \$10,000 a year, for each student. There is no economy of scale, because the more we take in, the more supervision we need to provide and therefore the more money is lost.

From a university perspective, they question the benefit of the program and it is difficult to put a dollar figure on the benefits to the reputation of the department and the benefits to Australian sport of these types of specialist programs. It is almost impossible to make an economic case for them unless you look at what the department is doing as a whole, which is what happened previously.

SH: There is a need to balance the losses in some areas with the relative gains in others.

PT: That's right. The undergraduate programs that are cash-rich should subsidise the more specialist training at a higher level. I don't think there is anything wrong with that, but the argument is falling on deaf ears in universities at the moment. Currently,

it is sports psychology that is feeling the pinch but it could be any other sport and allied health professions.

SH: We have lost two of our four specialist programs and there is no guarantee that the other two will be immune to this problem. So what if we do lose all the programs?

PT: In simple terms, if we lose all the programs, there is no specialist training for sports psychologists in Australia in a university environment. The question then is what other models might there be? Well, certainly there would be potential for training psychology honors graduates in the Institutes of Sport for two years. Called the 'four-plus-two model', it is an acceptable route of membership into the APS and registration. There is reason to believe that this option may close and it will become a compulsory six-year training model, which would make a problem, but at the moment there is potential of doing those two years in the Institute of Sport. In fact the NSW Institute of Sport has dabbled in that area; people pay \$16,000 dollars to go and work for free at NSWIS and get their supervision while they're doing it.

There is an ethical question there: whether that is the exploitation of aspirant sports psychologists who see the opportunity of going to NSWIS as an opportunity too good to give up and "Yes I'm going to pay whatever it takes to get in".

There is also a question of what impact that has on the core business of Institute. They have now built up an education arm which has the potential to detract from the specialists' work to provide support for athletes. The question that is worth asking, and I suspect it might, is if that became the model then would elite Australian sport be the overall loser? If there were no specialists then Australian sport is the loser.

I think the AOC had 12 psychologists in Sydney and only four in Athens. What they did instead was appoint Athlete Liaison Officers. I think Dawn Fraser was the first of those and Laurie Lawrence. I mean those guys

are heroes of Australian sport and they would inspire but they were put into situations out of their depth. The women's hockey team were down and they needed some help and John Eales came in but he was out of his depth because they really needed a sports psychologist there. Laurie Lawrence was good for morale. The point is there is a sense from the AOC that what you need is somebody there to jolly things along rather than any clinical-based skill, which for the most part are not needed, but when they are required they are essential. And that shows the value of specialist training and that's going to disappear from Australia if we are not careful.

SH: One of the answers is for a more inclusive accounting for programs.

PT: Yes, another possible solution; universities will just have to double or triple the fees that they will charge. That would act as a disincentive to enter the profession because no one enters this profession to make lots of money. The other possibility is the government will have to increase the support for these programs in the same way it provides supports for nurses and labor intensive programs. But I'm not very optimistic about the future. I can't see a readily-implemented solution but I can see that, if things continue, the excellence of Australian sport will be threatened.

SH: As you said earlier, for our readers, this could be the tip of the iceberg in terms of threats to professional and specialist training programs in other areas.

PT: Sports psychology is a small specialist profession; there are only about 100 members of the College of Sports Psychologists and other bigger colleges may still be having the same dilemma in a couple of years time because all specialist masters programs lose money if you account for them independently.

Single-sex competition in junior netball: the continuing debate

By Geraldine Naughton and John Carlson

Abstract

>>The age limit for children's single-sex sporting competition was recently increased from 12 to 14 years of age in the Victorian Civil and Administrative Tribunal (Equal Opportunity Court). In November 2003, the Court ruled against single-sex participation in the case of a 14 year old female wishing to compete in the sport of Australian Football. The finding in support of mixed competition was made on the basis of minimal physiological strength and size differences between genders up to 14 years of age. Officials from Netball Victoria were subsequently invited to re-defend the previously obtained right for the option of single-sex netball competitions. We present a number of arguments for the right to retain a choice for single-sex netball competitions. Restricting the options to play netball during the early years of adolescence may further decrease existing poor sports participation rates in young females in Australia. Our conclusion is that young females' total health is a bigger issue than population statistics for strength and size differences and should be considered in decisions on equality of participation in the predominantly female domain of netball.<<

Currently, equal opportunity decisions can only be based on stamina, strength and physique. A landmark decision in the Victorian Civil and Administrative Tribunal in November 2003 extended the age of mixed gender sport from 12 to 14 years (<http://www.playbytherules.net.au/whats.html>). The decision was largely based on the substantial overlap in

growth rates of boys and girls up until the age of 14 years. The lack of a gender gap between measures of physique and leg strength in boys and girls precluded the possibility of young people being able to participate in single-sex sport largely until 15 years of age and above.

Girls aged 11 to 14 years have major psychosocial issues with sports participation that link to self-esteem, perceived physical competence, perceptions of behavioural control and perceived benefit versus risk decisions about participation.

Interestingly, the decision was not based on the marked global differences in stamina (shown by field and laboratory tests for cardiorespiratory endurance) between boys and girls. Stamina differences between boys and girls were dismissed because of evidence citing results from endurance testing of adolescent girls may be more reflective of low motivation than endurance capacity. A closer examination of the gender difference in endurance test performances may have been more illuminating. We contend that girls aged 11 to 14 years have major psychosocial issues with sports participation that link to self-esteem, perceived physical competence, perceptions of behavioural control and perceived benefit versus risk decisions about participation.

We argue a rationale that strategies for attracting girls to initiate or maintain participation in netball should include the right to choose to compete against aged-matched males. The rationale has a broader health basis than leg strength tests and body size.

The purpose of this article is to raise awareness of defensible issues for the right to choose single-sex options for netball in young females from a number of perspectives. These perspectives include: the need to increase girls' sports participation outside of school, frequent reports of lower levels of physical activity participation in girls than boys from an early age, poorer upper body strength and skill differences in girls than boys, relatively less sports-specific strength and power in girls than boys, higher intensity of boys' participation in sporting activities compared with girls, and psychosocial issues surrounding puberty in girls.

Need to increase girls' participation in sport outside school

Sports participation rates are not increasing for girls. Figure one shows the percentage of girls and boys (aged 5 to 14 years) reporting sports participation outside of school during the 12 months prior to April 2003.

Boys' participation increased significantly from 66% to 69% between the data collection periods of April 2000 and 2003. The slight rise in girls' participation from 54% to 56% remained substantially less than boys and was not significant(2).

Figure 2 shows age-specific participation rates for children aged five to 14 years. The decline in girls' physical activity begins at 12 years and continues to 14 years of age. Chronological age decreases coincide with momentous maturational biological and psychosocial changes in puberty. Inherent in these changes is the increased attention on self-esteem and body appearance. We argue that physical activity in girls who have issues with poor self-esteem and concerns about body appearance should offer a high likelihood of satisfaction and a low likelihood of failure or other negative consequences. It is possible that lowly active girls may be most affected by the inclusion of boys into the popular sport of netball which remains the most acceptable sporting option for young females in Australia.

Across Australia, the most popular organised sports for boys were outdoor soccer (22%), swimming (16%) and Australian Rules football (14%). For girls, netball (18%), swimming (17%) and tennis (8%) were the most popular (Figure 3).

Despite the popularity of netball, only one in two girls report sport or leisure physical activity outside of school. Campaigns to promote physical activity have strong justification for gender inclusiveness. In some states of North America, separate physical education sessions for boys and girls are against the law. An innovative school/community/family linked elective program was recently offered to lowly active adolescent girls. The program focussed on gender-inclusive activities and issues. Lowly active adolescent girls showed increases in perceptions of physical competence and attitude to activity following the 16 week program(3). Gender inclusive curriculum and community sporting opportunities may be an effective strategy for addressing undesirable consequences of sedentary behaviour in young females.

It is difficult to suggest why girls' sports participation rates have decreased markedly over the past two

Fig 1: Adapted from: Pyke, 1986(1), & Australian Bureau of Statistics. ABS: Cat. 4901.0 Children's Participation in Cultural and Leisure Activities, Australia, January 2004(2).

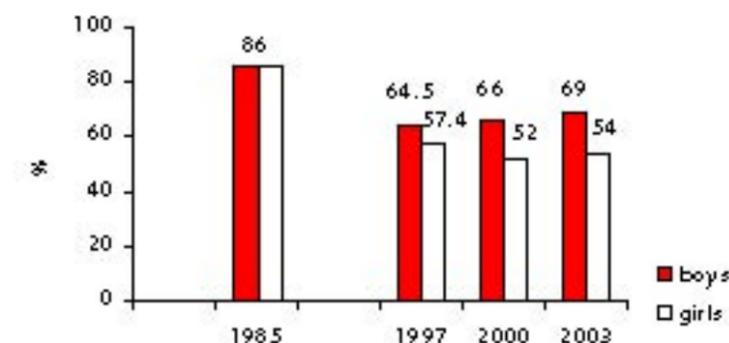


Fig 2: Adapted from ABS: Cat. 4901.0 Children's Participation in Cultural and Leisure Activities, Australia, January 2004(2).

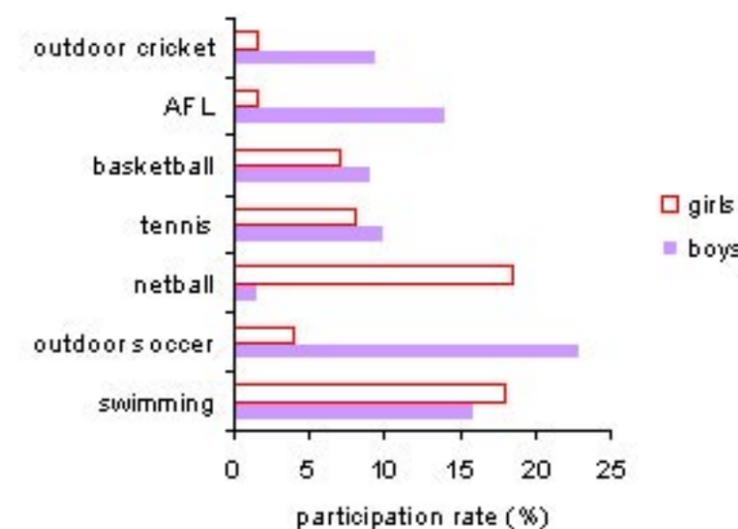
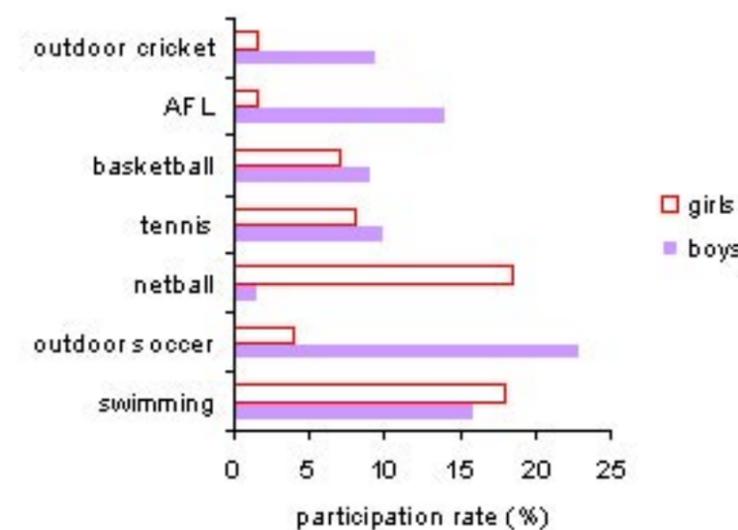


Fig 3: Adapted from ABS: 4901.0 Children's Participation in Cultural and Leisure Activities, Australia, Jan 2004(2).



decades in Australia. Participation in other leisure and cultural categories of dance, singing and drama increased in girls between 2000 and 2003. Cultural and leisure activities other than sport carry innate social and personal rewards. However, long-term commitments to physical activities that require moderate to vigorous bouts of intensity such as netball hold unprecedented links to major health benefits. The benefits of habitual physical activity in young people include cardiorespiratory health(4), stronger musculoskeletal health(5) and improved weight management(6).

The highest incidence of overweight and obesity occurred in Australian children in 1995 between the ages of seven and 11 years(7). We contend that creating barriers to girls' participation in the years of high need for weight management is not supportive of families concerned about their daughters' weight. Unlike pubertal changes in boys, girls of every shape and size gain substantial additional fat mass with puberty. Physically active girls manage this fat gain better than their less active peers(8).

Girls are less active than boys

A gold standard for measuring the intensity and frequency of physical activity in large population studies remains elusive. A number of survey instruments and objective movement sensors are available but all activity measures have advantages and disadvantages.

Within the methodological limitations, international trends generally show that girls are less active than boys from the earliest age at which measurement can occur. Lower activity in girls than boys does not have a scientific explanation. Minimal physiological differences are evident between boys and girls up until the age of puberty. However, marked differences in sociocultural expectations of activity in boys and girls are accepted as the strong contributors to lower physical activity

and cardiorespiratory fitness in girls than boys(8).

Puberty can have a significant impact on the physical activity choices in girls. Given that pubertal development begins at around 10 years of age in girls, developmental considerations should be paramount between the ages of 11 to 14 years in young females. Evidence of early maturing girls being less active than their late maturing peers(9) highlights the need to provide gender and racially-sensitive options attractive to girls.

It is difficult to suggest why girls' sports participation rates have decreased markedly over the past two decades in Australia.

Girls have poorer upper body strength, leg power and skill differences than boys

The validity of most field-based tests for strength in large populations of children has been strongly criticised for skill rather than strength bias (eg, standing jumps and bench press). Further, because large-scale testing programs in schools require parental consent, normative results are not necessarily representative of true differences. Field-based leg strength testing is generally limited to explosive jumping skills such as standing broad jump and vertical jumps. Relatively small differences are observed in results from explosive jumping skill tests conducted in children four to 18 years of age(8) and seven to 15 years(1).

However, throwing-based sports such as netball often rely on upper body strength. Again, results are limited by criticisms of inadequate validity of strength testing, but marked differences are presented in upper body strength tests and tests of

distance throws(1, 8).

Limited gender differences in young populations are observed in results from explosive jump testing in the field. But gender differences in leg power are significantly greater when the ability to sustain high energy demands is tested under more reliable laboratory conditions(10).

Tests of sustaining short-term high intensity energy expenditure are generically termed anaerobic tests. Anaerobic power assessed under laboratory conditions show poorer power output in girls than boys in absolute (measured in joules) and relative (joules per kg) terms. Girls have less leg power than boys. Again, in sports where leg power may be important such as netball, girls may be seriously outplayed by age-matched males.

Higher intensity of boys' participation in sport

Even when adolescent males and females participate in the same amount of physical activity, young males participate in activities at a higher intensity than females(8, 11-12). Furthermore, results from a motivation profile for sports participation in active youth aged nine to 14 years from Western Australia scored boys higher than girls in a subscale for aggression(13).

How equal is the playing field when higher intensity rates and more aggressive motivation are predictable from boys? Perhaps the percentage of girls who are habitually highly active would not be daunted by the prospect of boys playing intensively. But with approximately one in two girls in Australia not participating in sport, adding inequality of intensity to potential barriers to participation is extraordinarily unacceptable.

We acknowledge the absence of data on higher injury rates in mixed gender sports than single sports. But we suggest there are other markers within junior sports injury research worth considering.

Although boys generally participate in sport at a higher intensity, as early as six years of age, girls perceive a greater risk of injury(14). In addition to a higher perception of injury risk in mixed rather than single-sex competition, girls' perceptions of competence may be lowered by an inability to match the intensity, leg power, upper body strength and confidence of male participants.

Psychosocial issues surrounding puberty in girls

The incidence of eating disorders in adolescent girls is greater than boys(15-16). Sensible lifestyle alternatives to restrictive dieting for weight management and body appearance must be offered to avoid adolescent female issues in achieving energy balance. Physical activity is a logical and developmentally appropriate means to contribute to energy balance in young females.

Gender-considerate sporting opportunities also provide one of the strategies to avoid or manage highly complex psychosocial and maturational issues prohibiting physical activity in adolescents(3).

Compounding the psychosocial needs of adolescent girls is the need to address the increasing prevalence of overweight and obesity among young people in Australia. Although not directly implicit in the literature, hopefully positive wellbeing will apply to active young populations, given findings of increased potential for depression(17), social marginalisation(18) and poorer quality of life in overweight and obese young people(19, 20).

Perceived behavioural control was identified as a key mediator in predicting physical activity in a recent study of more than 1,000 adolescent females(21). Choices in physical activity therefore become critical to adolescent females.

Conclusion

Decisions for participation rights based on strength and physique fail to embrace more critical aspects of physical activity needs and consequences in young females.

Consideration should be given to the indisputable evidence linking physical inactivity to cardiovascular disease, diabetes, some cancers and debilitating psychosocial consequences. Evidence of clustering of cardiovascular risk factors in young populations continues to amass. Health promotion campaigns targeting populations at high risk of physical inactivity that, in Australia, include young females are immeasurably justified.

Every effort should be made to offer choices for positive, effective and low-risk activities in community sport for young females. Girls aged 11 to 14 years must have the right to choose whether or not they play competitive, low contact sport against age-matched males.

Geraldine Naughton is Associate Professor in Paediatric Exercise Science at the Centre of Physical Activity Across the Lifespan, Australian Catholic University, and John Carlson is Professor and Director of the Centre for Ageing, Rehabilitation and Exercise Science at Victoria University.

References

1. Pyke J. *Australian health and fitness survey 1985*. Australian Council for Health, Physical Education and Recreation, 1987. Adelaide
2. Australian Bureau of Statistics. *ABS: Cat. 4901.0 Children's Participation in Cultural and Leisure Activities*, Australia, January 2004
3. Newmark-Sztainer D, Story M, Hannan P et al. New Moves: a school-based obesity prevention program for adolescent girls. *Preventative Medicine* 2003; 37: 41-51
4. Li S, Chen W, Srinivasan SR et al. Childhood cardiovascular risk factors and carotid vascular changes in adulthood: the Bogalusa Heart Study. *Journal of the American Medical Association* 2003; 290(17): 2271-6
5. Rowlands A, Ingledeed DK, Powell SM et al. Interactive effects of habitual physical activity and calcium intake on bone density in boys and girls. *Journal of Applied Physiology* 2004; 97(4): 1203-8.
6. Moore LL, Gao D, Bradlee ML et al. Does early physical activity predict body fat change throughout childhood? *Preventative Medicine* 2003; 37: 10 - 17
7. Magarey AM, Daniels LA, Boulton TJC. Prevalence of overweight and obesity in Australian children and adolescents: reassessment of 1985 and 1995

8. Malina R, Bouchard C, Bar-Or O. *Growth, maturation and physical activity*. 2nd edition. 2004; Human Kinetics. Champaign, IL
9. Bradley CB, McMurray RG, Harrell JS et al. Changes in common activities of 3rd through 10th graders: the CHIC study. *Medicine & Science in Sports & Exercise*. 2000; 32(12):2071-8.
10. Naughton GA, Carlson JS, Buttifant DC et al. Accumulated oxygen deficit measurements during and after high-intensity exercise in trained male and female adolescents. *European Journal of Applied Physiology* 1997; 76(6): 525-531
11. Garcia AW, Pender NJ, Antonakos CL et al. Changes in physical activity beliefs and behaviors of boys and girls across the transition to junior high school. *Journal of Adolescent Health*. 1998; 22(5):394-402
12. Trost SG, Pate RR, Sallis JF et al. Age and gender differences in objectively measured physical activity in youth. *Medicine & Science in Sports & Exercise*. 2002; 34(2):350-5.
13. Grove JR, Hood K., Blanksby BA et al. Psychological development of participants in high-level junior sport. In: Blanksby, B.A. (ed.) et al., *Athletics, growth, and development in children: the University of Western Australia Study 1994*; Harwood Academic Publishers Langhorne, Pa.
14. Morrongiello BA, Midgett C, Stanton JKL. Gender biases in children's appraisals of injury risk and other children's risk-taking behaviours. *Journal of Experimental Child Psychology* 2000; 77: 317-336
15. Patton GC, Selzer R, Coffey C et al. Onset of adolescent eating disorders: population based cohort study over 3 years. *British Medical Journal* 1999; 318(7186): 765-8
16. Patton GC, Coffey C, Sawyer SM. The outcome of adolescent eating disorders: findings from the Victorian Adolescent Health Cohort Study. *European Child & Adolescent Psychiatry*. 2003; 12 Suppl 1: 125-9
17. Pine DS, Goldstein RB, Wolk S et al. The Association Between Childhood Depression and Adulthood Body Mass Index. *Pediatrics* 2001; 107(5): 1049-5
18. Strauss RS, Pollack HA. Social marginalization of overweight children. *Archives of Pediatrics & Adolescent Medicine* 2003; 157: 746-752
19. Friedlander SL, Larkin EK, Rosen CL et al. Decreased quality of life associated with obesity in school-aged children. *Archives of Pediatrics & Adolescent Medicine*. 2003; 157(12): 1206-11
20. Williams J, Wake M, Hesketh K et al. Health-related quality of life of overweight and obese children. *Journal of the American Medical Association* 2005; 293(1): 70-6
21. Motl RW, Dishman RK, Ward DS et al. Comparison of barriers self-efficacy and perceived behavioral control for explaining physical activity across 1 year among adolescent girls. *Health Psychology* 2005; 24(1): 106-11

» Continued from page 5

prepared to toe the line of the medical profession and the AMA and not ever claim that I personally am being paid by Medicare, only that my patients are (and I am billing my patients). But I will go on the record as saying that, as a sports physician, I am being unfairly discriminated against by the Medicare system. The AMA claims that it is not in the business of telling doctors what to charge (or what the government should rebate), so it is not interested in the fact that sports physicians have much lower rebates than other doctors.

If Medicare paid an \$80 rebate for a consultation with a male doctor and a \$60 rebate for a consultation with a female doctor of the same type, do you think the AMA would get away with the line that female doctors weren't being discriminated against because they were still free to charge their patients exactly what male doctors charge? If the AMA didn't think this was an issue of the highest importance immediately, they would lose most of their female members. So the ACSP is at a stalemate with the AMA, who could be our most important advocate if there was an AMA policy for something as simple as equal pay for equal work.

Unfortunately, the AMA is anything but committed to this (because its members who get more lucrative rebates don't want the status quo changed) and, because it is indifferent to the lower rebates of sports physicians, most sports physicians refuse to pay membership fees to the AMA. With an important body like the AMA not interested in promoting either sports physicians or (as far as I can see) greater exercise in the community, there is again less voice making this issue a relevant one for the government.

Based on the time lag between the knowledge that smoking was a killer and government policy to discourage smoking, we are probably looking at another decade before the governments of the day get serious with pro-exercise policies. I am only aware of one exercise policy in the life of the Howard government, which has been (belatedly) to encourage schools financially to have a minimum number of physical education classes. By comparison, it is much more committed to funding schools based on whether they are in marginal electorates than whether they encourage sport. It has sat on its hands while local councils have demolished local playgrounds in order to reduce

public liability premiums.

The Coalition at the last election didn't have an exercise policy, whereas the Opposition was prepared to devote a couple of million to a "program" to encourage people to exercise, although there was nothing revolutionary in their policy statement. One of the next big planned Federal Government initiatives is to pass legislation to make all union and facility fees voluntary at universities. This will have the fantastic effect of meaning that many sports facilities at universities will fall into disrepair or need to be closed down, because -- surprise surprise -- university students aren't going to want to pay voluntary fees. If the government made income tax or the Medicare levy voluntary, then hardly any one would pay it either. The Government seems to be oblivious to the fact that its policies can and do affect the amount that people exercise. But until the people are prepared to make this a political issue, there is unfortunately no incentive for the Government to act.

Page 6: Unforeseen consequences: How abolishing compulsory student unionism undermines the struggle against obesity

Cricket Australia: Injury Report 2004

by John Orchard and Trefor James

Cricket is one of the world's major team sports. Injuries in cricket are common, particularly to fast bowlers(1-8). According to Van Mechelen et al, ongoing injury surveillance is a fundamental process behind successful injury prevention(9). There is general agreement that cricket should follow the Van Mechelen paradigm of injury surveillance being the basis for risk factor and interventional studies which can ultimately lead to injury prevention 7. However, successful ongoing injury surveillance in even major sports has proven elusive, partially because of the difficulties in forming consistent injury definitions 10. This lack of consensus has severely limited the ability to compare injury rates between countries and to ascertain risk factors for injury.

Injury surveillance in professional cricket in Australia has been prospectively undertaken continuously since the start of the 1998-99 season(1). Data from seasons 1995-96 to 1997-98 is available in the current database as a result of retrospective survey using a number of different methods(1). The only known attempt at previous injury surveillance in Australian cricket was performed by Hoy and Payne in the mid-1980s(11, 12).

With the establishment three years ago by Cricket Australia of a research board, the injury survey is now an ongoing core component of cricket research in Australia. It will not only continue to provide a framework to highlight the most important areas which need further study, but it will also mean that, in the long-term, injury surveillance can follow trends in injury rates to test the interventions which are recommended by other studies(9, 13).

Methods

The methods for this report are those of the new international definitions for cricket injuries. These definitions have been agreed upon and recently published(14, 15). An injury is defined as: Any injury or other medical condition that either: (1) prevents a player from being fully available for selection in a match or (2) during a major match, causes a player to be unable to bat, bowl or keep wicket when required by either the rules or the team's captain. Other definition details are available in the recently published consensus statement(14, 15).

Results

Injury exposure

Table 1 lists the designated hours of player exposure in matches each season. As per the new international formula(14, 15), hours of player exposure in matches is calculated by multiplying the number of team days of exposure by 6.5 for the average number of players on the field and then multiplied by the average number of designated hours in a day's play. For first class matches this is six hours per day and for one day matches this is 6.667 hours per day. The exposure (in terms of match hours) was at its highest level in season 2003-04, compared to the previous eight seasons.

Generally each team is bowling 40-48 overs per scheduled day, and is presumably in the field for half of each match. The Australian Test teams of the last decade have often had the advantage of superiority to the opposition and as a consequence have spent less time in the field than batting. This decreased workload has probably helped with respect to injury risk.

Table 1 – Designated player hours of exposure in matches each season

COMPETITION	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
ING Cup	1561	1561	1821	1821	1734	2688	2688	2688	2688
Pura Cup	9204	9594	9126	8658	9048	9048	8892	8580	9516
One Day International	737	1041	1214	997	1474	954	910	1387	1387
Test Match	1053	1443	2574	2067	2067	1287	2379	1248	2691
Total	12555	13638	14735	13543	14323	13977	14869	13903	16282

New Sports Medicine Title!

Therapeutic Exercise for Athletic Injuries 2nd Edition

Peggy Houglum
2005 | 0736051368 | \$212.30
Special Price for Sport Health readers: \$194.70

This revised and updated edition of *Therapeutic Exercises for Athletic Injuries* will give you a thorough understanding of the science and application involved in creating superior therapeutic exercise programs. This expansive text offers the most comprehensive approach available to therapeutic exercise to help readers develop a deeper understanding of the why, what and when of therapeutic exercise techniques. It also presents the methodology for developing safe and effective therapeutic programs for the general population, as well as individual programs for specific audiences.



Due March 2005!

To order or request a free Sports Medicine catalogue, contact
Human Kinetics Australia

Telephone: 08 8277 1555 | Facsimile: 08 8277 1566
Email: info@hkaustralia.com | www.HumanKinetics.com

Special ends June 30th, 2005

Injury incidence

Over the nine seasons, there were 793 injuries that qualified as an injury according to the new international definition. There were 674 injuries that qualified as a seasonal injury for one of the State squads and 210 injuries that qualified as a seasonal injury for the Australian squad. Therefore there were 91 injuries that qualified as both a state squad injury and an Australian squad injury (ie, they were injuries that caused an Australian squad player to miss both games for his State and for the national team). Of the 793 injuries, 728 were new and 65 were recurrences. A total of 413 injuries occurred during major matches, of which 380 were new injuries and 33

recurrences. Of the 413 match injuries, 192 occurred bowling, 87 occurred batting, 91 fielding, 8 wicketkeeping with the remainder either occurring gradual or in an unknown activity.

Injury incidence results are detailed in Tables 2-4. Injury match incidence is calculated in Table 2 using the number of total injuries (Table 2(a)) or number of new injuries (Table 2(b)) as the numerator and the number of player hours of exposure (Table 1) as the denominator.

Injury match incidence in the units of injuries per 10000 player hours is higher in One Day Internationals than Test matches. There is also a small difference in injury match incidence

between domestic One Day matches and first class matches, although not to the same extent as in international cricket. Because first class matches are played over a much longer duration than One Day matches (at both domestic and international level), they produce a higher number of injuries per match, even though the hourly rate is lower. The scheduling format of cricket in Australia tends to produce different biases for injury rates. There is generally less of a break between successive One Day Internationals than Test Matches, so the risk of missing a subsequent match is generally greater in One Day Internationals. However, at domestic level, a one day match is

often scheduled soon after a four day match, increasing the risk that an injury from the four day match will caused the subsequent (one day) game to be missed.

Table 2 a and b

The matches with generally the highest incidence of match injuries are One Day Internationals played in Australia, although this was lower than usual in 2003-04 (Table 2). However, bowling match injuries occur at a lower rate in One Day Internationals than Test matches (Table 5). The majority of home One Day Internationals are played in quick succession as part of the Carlton and United Tri-series (mainly during January and February each summer). From Australia's viewpoint, this is the most crowded time of the international cricket calendar, with the Tri-Series continuing

on after back-to-back Test matches in Melbourne and Sydney over the Christmas and New Year period. Therefore, high recent workload is a particularly relevant consideration for the Tri-series.

It should be noted that Tables 2-5 reveal lower injury rates in the three seasons surveyed retrospectively. Because of the methodological differences, some of this difference may be spurious. However, Table 1 reveals a much lighter workload in these seasons, and there may have been a genuinely lower injury incidence related to the lower bowler match workload over this three-year period.

Seasonal incidence (Tables 3) is calculated by number of injuries (a) or new injuries (b) multiplied by 1500 (for a squad of 25 players over 60 days), divided by the number of

player days of exposure. Tables 3(a) and 3(b) show that, over a five-season period, there is very little difference in injury incidence between the six Australian States.

Tables 3a and b

Table 4 reveals that seasonal incidence by body part has generally been consistent over the past eight seasons. In 2003-04 there was an increase in ankle injuries, but generally the incidence of injuries by body part has remained constant.

Table 4

Table 5 lists incidence of bowling injuries (those 192 of the injuries which occurred in matches whilst bowling, which formed the basis of table 2(a), multiplied by 1000 and divided by number of overs bowled).

Table 2(a) - Injury match incidence (injuries/10000 player hours), new and recurrent injuries

MATCH TYPE		1995-6 TO 97-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	LAST 6 SEASONS
Domestic One Day		26.3	54.9	34.6	48.4	22.3	37.2	67.0	44.0
First Class Domestic		24.4	32.3	24.3	22.1	45.0	24.5	23.1	28.5
State matches	Total	24.6	36.3	26.0	28.1	39.7	27.5	32.8	31.7
One Day International	Home	39.8	115.3	115.3	53.2	28.8	106.5	17.7	73.5
	Away	63.4	41.9	38.4	51.3	35.5	48.6	85.0	51.0
	Total	53.5	80.2	61.1	52.4	33.0	72.1	57.7	60.5
Test Match	Home	30.8	38.5	88.8	25.6	18.3	24.4	64.1	45.8
	Away	23.3	15.5	38.0	19.7	38.9	23.3	23.3	27.4
	Total	27.6	24.2	62.9	23.3	29.4	24.0	44.6	36.6
International matches	Total	37.2	42.4	62.1	35.7	30.4	49.3	49.0	45.6
All matches	Total	27.1	37.7	34.9	29.3	37.7	31.6	36.8	34.8

Table 2(b) - Injury match incidence (injuries/10000 player hours), new injuries only

MATCH TYPE		1995-6 TO 97-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	LAST 6 SEASONS
Domestic One Day		20.2	49.4	34.6	40.9	18.6	29.8	59.5	38.4
First Class Domestic		22.6	26.6	22.1	22.1	41.6	24.5	21.0	26.2
State matches	Total	22.2	30.5	24.1	26.4	36.3	25.7	29.5	28.8
One Day International	Home	39.8	96.1	115.3	35.5	28.8	88.7	17.7	63.5
	Away	51.9	41.9	28.8	51.3	35.5	36.4	85.0	46.1
	Total	46.8	70.2	54.3	41.9	33.0	57.7	57.7	53.4
Test Match	Home	27.4	38.5	88.8	25.6	18.3	24.4	64.1	45.8
	Away	23.3	15.5	38.0	19.7	31.1	23.3	23.3	25.6
	Total	25.6	24.2	62.9	23.3	25.2	24.0	44.6	35.8
International matches	Total	33.5	39.2	59.3	31.2	27.4	41.7	49.0	42.4
All matches	Total	24.4	32.5	32.8	27.2	34.3	28.8	34.4	31.8

Table 3(a) - Injury seasonal incidence by state (injuries/team/season)

SQUAD NAME	1995-6 TO 97-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	LAST 6 SEASONS
Australia	15.7	18.4	15.5	18.0	15.5	22.2	18.3	17.8
New South Wales	10.9	14.2	11.7	15.6	18.5	9.2	19.9	14.9
Queensland	15.2	13.1	17.0	17.2	25.3	15.7	20.4	18.6
South Australia	12.1	24.3	13.5	23.1	17.6	17.9	19.9	19.4
Tasmania	13.7	17.7	13.9	18.4	16.9	20.5	13.2	16.8
Victoria	13.9	18.6	23.3	16.6	20.5	20.0	18.3	19.4
Western Australia	9.5	21.1	19.7	13.8	16.6	19.8	15.2	17.4
All states	11.2	15.4	13.7	16.6	17.3	16.0	15.4	15.8
All teams	13.2	18.4	16.2	17.3	18.3	17.8	18.0	17.7

Table 3(b) - New injury seasonal incidence by state (injuries/team/season)

SQUAD NAME	1995-6 TO 97-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	LAST 6 SEASONS
Australia	14.0	17.0	13.1	17.1	14.8	20.4	17.2	16.4
New South Wales	10.1	14.2	11.7	15.6	16.5	8.1	19.9	14.3
Queensland	14.7	13.1	17.0	15.9	20.7	15.7	16.7	16.7
South Australia	11.1	21.9	13.5	20.0	15.3	15.6	19.9	17.6
Tasmania	12.5	17.7	13.9	18.4	15.7	19.1	7.9	15.3
Victoria	12.6	18.6	21.8	15.5	20.5	18.8	15.4	18.2
Western Australia	8.1	13.6	17.1	11.5	15.6	18.6	15.2	15.3
All States	10.3	14.0	13.1	15.4	15.7	14.9	13.7	14.5
All teams	12.0	16.8	15.0	16.2	16.8	16.5	16.2	16.3

Table 5
Table 5 shows that the incidence in terms of injuries per overs bowled has actually decreased slightly over the

period 1998-99 to 2003-04, although as previously noted the number of overs bowled has gradually increased over this time period.

Table 4 - Injury seasonal incidence 1995-6 to 2003-04 seasons (injuries/team/season)

INJURY CATEGORY	1995-6 TO 97-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	LAST 6 SEASONS
Fractured facial bones	0.1	0.0	0.3	0.2	0.3	0.0	0.1	0.2
Other head and facial injuries	0.2	0.2	0.0	0.0	1.0	0.2	0.1	0.3
Neck injuries	0.2	0.0	0.2	0.3	0.0	0.0	0.0	0.1
Shoulder tendon injuries	0.4	1.2	1.4	0.5	0.9	1.1	0.0	0.8
Other shoulder injuries	0.4	0.0	0.0	0.5	0.7	0.3	0.4	0.3
Arm/forearm fractures	0.1	0.4	0.3	0.0	0.0	0.0	0.0	0.1
Other elbow/arm injuries	0.1	0.2	0.2	0.5	0.0	1.1	0.1	0.3
Wrist and hand fractures	0.7	1.1	0.7	1.7	1.7	1.1	1.0	1.2
Other wrist/hand injuries	0.6	0.5	0.7	0.5	0.1	0.6	0.7	0.5
Side and abdominal strains	1.1	1.6	1.0	2.0	1.8	0.5	1.1	1.3
Other trunk injuries	0.1	0.5	0.0	0.2	0.4	0.0	0.5	0.3
Lumbar stress fractures	0.7	0.2	0.5	0.5	0.7	1.4	1.0	0.7
Other lumbar injuries	0.8	1.8	1.0	1.4	0.9	1.9	1.8	1.5
Groin and hip injuries	0.7	2.0	0.7	1.0	0.9	2.2	2.2	1.5
Thigh and hamstring strains	2.6	3.2	1.6	2.6	2.6	1.9	2.9	2.5
Buttock and other thigh injuries	0.2	0.0	0.2	0.9	0.1	0.0	0.8	0.3
Knee cartilage injuries	0.6	0.7	0.9	1.5	1.4	0.6	0.4	0.9
Other knee injuries	0.6	1.6	1.4	0.9	0.6	0.3	0.4	0.8
Shin and foot stress fractures	0.6	0.2	0.2	0.3	0.3	0.8	0.3	0.3
Ankle and foot sprains	0.5	1.1	1.2	1.0	1.1	1.0	1.6	1.2
Other shin, foot and ankle injuries	1.1	1.1	1.2	0.5	2.0	1.6	1.8	1.4
Heat-related illness	0.1	0.0	0.2	0.0	0.0	0.0	0.1	0.1
Other medical illness	0.7	0.9	2.4	0.3	0.9	1.0	0.7	1.0
Total injuries	13.1	18.4	16.2	17.3	18.3	17.8	18.0	17.7

Table 5 - Bowling match injuries (injuries per 1000 overs bowled)

COMPETITION	1995-6 TO 97-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	LAST 6 SEASONS
ING Cup	0.6	3.2	2.2	3.7	1.1	1.9	2.1	2.3
Pura Cup	0.9	1.9	0.9	0.9	1.5	1.5	0.9	1.3
One Day International	2.2	2.8	2.0	1.0	0.0	1.5	0.7	1.4
Test Match	1.6	1.0	3.2	2.2	1.8	2.4	2.5	2.2
Total	1.1	2.0	1.5	1.5	1.4	1.7	1.3	1.6

Helping Save Lives



HeartStart First Aid Defibrillator



The Bag Disposable Resuscitator



Spinal Solutions / Stifneck Collars

To place an order, contact Laerdal
Customer Service on 1800 331 565

www.laerdal.com.au
LAERDAL PTY LTD. PO Box 52, Oakleigh VIC 3166
Free Call: 1800 331 565 Free Fax: 1800 635 835
Email: customer.service@laerdal.com.au



Injury prevalence

Injury prevalence rates (Tables 6-9) follow a similar pattern to injury incidence although, whereas incidence stayed constant over the past five seasons, prevalence has gradually increased. The difference between the two can be attributed to the increased number of matches, with the 'average' injury artificially becoming more severe over recent years because there are more matches to miss (NB, Injury prevalence = injury incidence x average injury severity).

As expected and previously documented, pace bowlers (16.2%) have a higher injury prevalence than spin bowlers (4.6%), batsmen (4.7%) and wicket-keepers (1.7%) (Table 8).

There were no striking differences in injury prevalence between States over the six-year period. Certain States had individual years in which injury prevalence was very high, usually due to a few players suffering long-term injuries that stopped them playing for the majority of the season.

Table 10 shows that injury prevalence for all positions increases in players over 30 years of age. However, pace bowlers exhibit their highest injury prevalence in bowlers 22 years of age and under. This is due mainly to the increased incidence and prevalence of lumbar spine stress fracture in younger bowlers. Side strains are also more likely to occur in younger bowlers, whereas shoulder injuries, knee injuries, hamstring and calf strains are more common in older bowlers.

Risk factors for bowling injury

Table 11 shows an increase in risk per innings and risk per 1000 balls for bowling second in a one day match and bowling in the second innings in a Test match. The risk of bowling in the second innings of a One Day match (compared to the first) is not significant (odds ratio 1.41, 95% C.I. 0.81-2.47). The risk for the second innings of a first class match compared to the first is statistically significant (odds ratio 1.90, 95% C.I. 1.35-2.67). There does not seem to be any consistent relationship as to whether or not the bowler has batted prior to bowling or not-batted, suggesting that fatigue from batting is not a relevant risk factor.

Table 6 – Comparison of injury prevalence between States

TEAM	1995-6 TO 97-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	LAST 6 SEASONS
Australia	7.6%	8.6%	8.8%	11.1%	6.7%	6.8%	11.7%	9.0%
New South Wales	7.8%	5.0%	5.6%	6.0%	5.4%	6.7%	15.1%	7.3%
Queensland	10.2%	3.6%	5.2%	8.8%	16.6%	8.8%	14.5%	10.3%
South Australia	6.7%	9.0%	9.8%	12.1%	14.5%	9.3%	10.0%	10.8%
Tasmania	4.3%	7.1%	6.1%	6.5%	8.8%	8.7%	3.3%	6.8%
Victoria	6.2%	8.0%	5.6%	14.5%	12.6%	9.9%	13.7%	11.1%
Western Australia	4.6%	6.9%	9.3%	7.2%	6.9%	10.5%	9.1%	8.4%
Average	6.9%	7.2%	7.5%	9.5%	9.7%	8.5%	11.4%	9.1%

Table 7 – Injury prevalence by match type

COMPETITION		1995-6 TO 97-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
Domestic one day		7.1%	7.1%	7.0%	8.0%	11.3%	8.8%	11.9%
First class domestic		6.7%	6.6%	6.9%	9.5%	10.4%	8.9%	11.2%
State	Total	8.9%	6.7%	6.9%	9.2%	10.6%	8.9%	11.3%
	Home	10.4%	15.6%	12.3%	9.3%	8.9%	9.5%	8.8%
One day international	Away	6.0%	11.6%	5.7%	13.0%	9.1%	6.5%	17.7%
	Total	9.8%	13.7%	7.8%	10.8%	9.0%	7.7%	14.1%
Test cricket	Home	6.0%	8.3%	9.9%	14.0%	7.3%	6.6%	13.5%
	Away	8.0%	5.0%	9.7%	7.9%	6.3%	4.7%	8.5%
	Total	6.9%	6.3%	9.8%	11.5%	6.7%	6.0%	11.0%

Table 8 – Injury prevalence by player position

POSITION	1995-6 TO 97-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	LAST 6 SEASONS
Batsman	2.1%	3.9%	3.5%	5.4%	4.7%	2.8%	7.2%	4.7%
Keeper	2.1%	2.8%	1.3%	0.8%	0.7%	0.8%	3.5%	1.7%
Pace bowler	13.5%	11.5%	14.0%	15.1%	19.7%	17.2%	18.7%	16.2%
Spinner	1.7%	4.9%	1.4%	9.9%	1.1%	4.0%	6.8%	4.6%
TOTAL	6.9%	7.2%	7.5%	9.5%	9.7%	8.5%	11.4%	9.1%

Table 9 – Comparison of injury prevalence by body parts

INJURY CATEGORY	1995-6 TO 97-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	LAST 6 SEASONS
Fractured facial bones	0.0%	0.0%	0.1%	0.1%	0.2%	0.0%	0.0%	0.1%
Other head and facial injuries	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Neck injuries	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%
Shoulder tendon injuries	0.2%	0.6%	0.4%	0.8%	1.4%	0.7%	0.1%	0.7%
Other shoulder injuries	0.2%	0.4%	0.0%	0.3%	0.6%	0.2%	0.4%	0.3%
Arm/forearm fractures	0.0%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.1%
Other elbow/arm injuries	0.0%	0.0%	0.0%	0.7%	0.0%	0.6%	0.0%	0.2%
Wrist and hand fractures	0.3%	0.1%	0.1%	0.9%	0.9%	0.3%	1.0%	0.6%
Other wrist/hand injuries	0.1%	0.2%	0.3%	0.1%	0.0%	0.2%	0.1%	0.1%
Side and abdominal strains	0.8%	0.4%	0.4%	0.4%	0.7%	0.2%	0.7%	0.5%
Other trunk injuries	0.0%	0.4%	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%
Lumbar stress fractures	1.0%	0.1%	0.8%	0.6%	1.1%	1.6%	2.4%	1.2%
Other lumbar injuries	0.5%	0.7%	1.3%	0.9%	0.3%	0.6%	0.7%	0.7%
Groin and hip injuries	0.4%	1.1%	0.1%	0.3%	0.7%	0.6%	0.9%	0.6%
Thigh and hamstring strains	0.9%	0.9%	0.7%	0.6%	0.7%	0.8%	0.7%	0.7%
Buttock and other thigh injuries	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.3%	0.1%
Knee cartilage injuries	0.5%	0.4%	0.6%	1.1%	1.2%	1.1%	0.4%	0.8%
Other knee injuries	0.2%	0.9%	0.4%	1.3%	0.1%	0.1%	0.2%	0.5%
Shin and foot stress fractures	0.8%	0.0%	0.1%	0.2%	0.2%	0.5%	0.0%	0.2%
Ankle and foot sprains	0.2%	0.4%	0.4%	0.5%	0.5%	0.3%	1.4%	0.6%
Other shin, foot and ankle injuries	0.4%	0.1%	1.1%	0.1%	0.7%	0.5%	1.3%	0.7%
Heat-related illness	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other medical illness	0.4%	0.2%	0.6%	0.1%	0.2%	0.2%	0.5%	0.3%
Total injuries	6.9%	7.1%	7.4%	9.5%	9.7%	8.5%	11.4%	9.1%

Table 10 - Comparison of injury prevalence by age and position

AGE	BATSMAN	KEEPER	PACE BOWLER	SPIN BOWLER
<=22	3.1%	0.0%	21.6%	3.1%
23-26	3.9%	2.3%	13.3%	1.0%
27-30	3.4%	0.6%	13.8%	5.2%
31+	6.2%	3.5%	20.2%	6.0%

Table 11 – Innings and risk of bowling injury

INNINGS TYPE	INJURED	NON-INJURED	RISK PER INNINGS	OVERS BOWLED	RISK PER 1000 BALLS
One Day bowling first	21	1786	1.2%	14579	0.240
One Day bowling second Day after batting	5	728	0.7%	5081	0.164
One Day bowling second Day after not-batting	14	538	2.5%	4298	0.543
One Day bowling second Night after batting	5	369	1.3%	2671	0.312
One Day bowling second Night after not-batting	6	331	1.8%	2705	0.370
One Day bowling second total	30	1966	1.5%	14755	0.339
One Day total	51	3752	1.3%	29334	0.290
First class first innings bowling first	28	1540	1.8%	29665	0.157
First class first innings bowling second after batting	22	1294	1.7%	23901	0.153
First class first innings bowling second after non-batting	10	491	2.0%	9874	0.169
First class first inning total	60	3325	1.8%	63440	0.158
First class second innings bowling after batting	49	1659	2.9%	23346	0.350
First class second innings bowling after non-batting	20	835	2.3%	12974	0.257
First class bowling after enforcing follow-on	4	224	1.8%	4378	0.152
First class second innings total	73	2718	2.6%	40698	0.299
First class total (per innings)	133	6043	2.2%	104138.2	0.213

Table 11

Of interest with respect to bowling injuries in innings after the follow-on has been enforced, although there were only four injuries occurring in this circumstance, none of them occurred during four-day games where the follow-on was enforced. All of them were suffered by the Australian team in Test matches. It may be that it is safer to enforce the follow-on in a four-day game as there is usually insufficient time for the batting team to go on to bat for a marathon second innings, which has occurred to the Australian team and has led to high acute workloads amongst the bowlers.

A further analysis of injury risk was taken in the following circumstances:

1. Bowling risk in the second innings of a game when a team-mate had been previously injured bowling in the first innings: although this would generally lead to higher workload, with current data this is not associated with a significant increase in injury risk.

2. Bowling in the second match of back-to-back matches (defined as less than a three day break between first class games or less than a one day break between one day games): this was associated with an increase in bowling injury risk (risk ratio 2.00, 95% CI 1.26-3.17).
3. Bowling after enforcing the follow-on in a Test match: associated with an increase in injury (risk ratio 9.42, 95% CI 3.29-26.94).

Risk factors for non-bowling injuries

It was reported four seasons ago that there were two injury mechanisms that were potentially immediately preventable. There were a number of injuries that occurred between 1995-96 and 1999-00 from sliding into the boundary fence, and it was felt that these could be prevented by instituting a boundary rope at all grounds(1). In baseball and softball, the use of slide-away bases has been shown to lower the rate of serious ankle injury(16). The boundary rope

policy was instituted at all grounds in the early stages of season 2000-01. There were no significant injuries from fence or rope collision in the past four seasons, indicating that this policy has been successful to date.

A number of injuries have occurred from football cross-training drills and these could potentially be prevented by substituting other less dangerous drills as cross-training activities. There has been a divergence of opinion regarding the feasibility of eliminating football drills from the cross-training regime of elite cricket players. Some fitness personnel feel that it was very difficult to avoid monotony in cricket training and that the benefit of occasionally including touch football or soccer games in the training regime outweighs the negative of injury risk. It is worth noting that the Indian cricket team uses volleyball as its practice activity as an alternate sport, as this has a lower injury risk than touch football. Since this issue has been highlighted and debated, there has been a reduction in the number of injuries occurring during football

drills, presumably because more care has been taken.

The incidence and prevalence of contact injuries during batting fortunately remains very small at the elite level, with fewer than 5% of batsmen missing through injury at any given time. This suggests that protective equipment being worn by batsmen during matches and training is adequate.

Discussion

Increased match workload as a risk factor

Dennis has found a relationship between the overall bowler workload (matches and training) and risk of bowling injury(17). It appears from this work (although it is not clearly established) that number of bowling sessions per week (whether they are training or match) is the factor which most correlates with injury risk.

In seasons prior to the workload study being implemented, it is not known what the extent of overall (match plus training) workload was, although it is very clear that match workload has increased over the years, particularly with respect to One Day Internationals.

Although formal recommendations have not been set in stone regarding the maximum or optimal number of bowling sessions or overs per week, once these figures are established, any increase in match workload will make it harder for players and coaches to fall within the prescribed range. English county cricket surveillance reveals an even higher match workload (match wise) for first class bowlers in England than Australia(8). However, injury prevalence is also higher in England than Australia, and our figure could be expected to rise if our match workload was also to rise.

Other ways which may limit excess workload in the future may include:

- 1 Scheduling changes: elimination of

back-to-back games, institution of a forced off-season (ie, maximum number of matches scheduled per year for national teams).

- 2 Rule changes: allow 12th man to bowl for an injured player, which would reduce excess workload in the event of a team being a bowler short. However, this rule would be very difficult to enforce with respect to exploitation by a team wishing to use the rule as a form of interchange.
- 3 Recommendation of tactical changes: avoiding enforcing the follow-on if upcoming matches are scheduled, deliberate rotation of bowlers, etc.

Biomechanics as a risk factor

Elliott has continued work showing that mixed bowling action is associated with a higher rate of lumbar spine injury(7). This recently published work reveals that junior players who have their action corrected show less progression of disc degeneration on MRI scan than in a previous observation study.

Because of the significance of bowling action as an injury risk, it is important eventually to establish a database of the most recently measured action type (perhaps assessed by shoulder counter-rotation) and to include this in future risk factor studies.

Conclusions

1. The greatest risk factors for bowling injuries that are apparent from current analysis of surveillance are bowling speed and workload. Other study has proven that the 'mixed' action is almost certainly a risk factor for lumbar spine injury in fast bowlers. Monitoring of bowling workloads in first class cricket has commenced and should be continued as a high priority. The focus on injury prevention in the medium term should be on bowling injuries in fast

bowlers, including ongoing injury surveillance, an ongoing workload study and regular screening of all first class fast bowlers in Australia. This ideally should include all pace bowlers having their exact workload monitored and an annual formal biomechanical assessment and lumbar spine MRI. Future scheduling should bear in mind the potential for workload increase on players, with respect to issues such as back-to-back games and total number of matches scheduled.

2. There was a significant increase in injury prevalence in 2003-04 for the Australian team in particular, perhaps associated with the increase in number of matches scheduled during this season (although a small number of long-term injuries may have had most of the effect seen).
3. The action implemented four seasons ago at all major grounds in Australia to use a boundary rope rather than the fence has been a major success. Prior to this, there had been two major ankle injuries (and five other minor injuries) over five seasons caused by collisions with the fence while fielding. Although this was a small number, it was foreseen that this could be reduced almost to zero by institution of ropes at all playing grounds in Australia. This has actually happened, with no significant injuries in four seasons since the playing condition change.
4. The international definition of injuries has been agreed upon, which will eventually lead to great advances in amount of data obtained and understanding of risk factors.

This is an abridged version of the official injury report. The full version is available at:

<http://www.injuryupdate.com.au/images/research/CA2004OfficialInjuryReport.pdf>

Acknowledgements

The authors of the injury survey would like to acknowledge the contribution of the following people over the 2003-04 season:

Team physiotherapists: Errol Alcott, Alex Kontouris (Australia), Patrick Farhart and Andy Nealon (New South Wales), Jon Porter (South Australia), Michael Jamison and Laurie McGee (Tasmania), David Edgar (Western Australia);

Team medical officers: Trefor James (Australia and Victoria), Simon Carter (Queensland), Terry Farquharson (South Australia), David Humphries and Peter Sexton (Tasmania), Damien McCann (Western Australia);

CA researchers and staff: Ross Dundas, Geoff Allardice, Steve Bernard, Ross Turner, Rebecca Dennis, Marc Portus.

References

- Orchard J, James T, Alcott E, Carter S, Farhart P. Injuries in Australian cricket at first class level 1995/96 to 2000/01. *British Journal of Sports Medicine* 2002;36:270-275.
- Stretch R. Cricket injuries: a longitudinal study of the nature of injuries to South African cricketers. *British Journal of Sports Medicine* 2003;37:250-253.
- Stretch R. Epidemiology of cricket injuries. *Int SportMed J* 2001;2(2).
- Stretch R. The incidence and nature of epidemiological injuries to elite South African cricket players. *South African Medical Journal* 2001;91(4):336-339.
- Leary T, White J. Acute injury incidence in professional county club cricket players (1985-1995). *British Journal of Sports Medicine* 2000;34:145-147.
- Gregory P, Batt M, Wallace W. Comparing Injuries of Spin Bowling with Fast Bowling in Young Cricketers. *Clinical Journal of Sport Medicine* 2002;12:107-112.
- Elliott B, Khangure M. Disk degeneration and fast bowling in cricket: an intervention study. *Medicine and Science in Sports and Exercise* 2002;34(11):1714-1718.
- Stretch RA, editor. A prospective study of injuries at first class counties in England and Wales 2001 and 2002 seasons. *Second World Congress of Science and Medicine in Cricket*; 2003; Cape Town.
- van Mechelen W, Hlobil H, Kemper H. Incidence, Severity, Aetiology and Prevention of Sports Injuries: A Review of Concepts. *Sports Medicine* 1992;14(2):82-99.
- Finch CF, Elliott BC, McGrath AC. Measures to prevent cricket injuries: an overview. *Sports Med* 1999;28(4):263-72.
- Payne W, Hoy G, Laussen S, Carlson J. What research tells the cricket coach. *Sports Coach* 1987;10:17-22.
- Hoy G. Survey of Victorian cricket injuries 1979-80 to 1983-84. In: Payne W, editor. Melbourne: Sports Coach, 1987.
- Elliott B, Hardcastle P, Burnett A, al. e. The influence of fast bowling and physical factors on radiological features in high performance young fast bowlers. *Sports Med Train Rehabil* 1992;3:113-30.
- Orchard J, Newman D, Stretch R, Frost W, Mansingh A, Leipus A. Methods for injury surveillance in international cricket. *Journal of Science and Medicine in Sport* 2005;in press.
- Orchard J, Newman D, Stretch R, Frost W, Mansingh A, Leipus A. Methods for injury surveillance in international cricket. *British Journal of Sports Medicine* 2005;in press.
- Janda D, Wojtys E, Hankin F, Benedict M. Softball sliding injuries. A prospective study comparing standard and modified bases. *Journal of the American Medical Association* 1988;259:1848-50.
- Stretch RA, editor. Australian Cricket Board National Fast Bowling Workload and Injury Study 2000-2002. *Second World Congress of Science and Medicine in Cricket*; 2003; Cape Town.

SDrA

Sports Doctors Australia Newsletter **sdra**



The On-Field Emergency Care Course

The 2004 Australian Conference of Science and Medicine in Sport in Alice Springs was the venue for the inaugural On-Field Emergency Care Course, sponsored and supported by Laerdel Australia and specifically designed for doctors responsible for the care of athletes and teams of all levels.

In our line of work, life threatening emergencies do occur and they occur out of the controlled hospital or clinic environment. Managing on-field emergencies is different to managing emergencies in familiar and controlled environments; they require a different strategy and different way of thinking. These emergencies will occur and you can't afford to be inadequately prepared to handle them. The On-Field Emergency Care Course was designed to fulfil the needs of the doctor facing these potential challenges.

This course was developed and facilitated by Dr Shane Brun, a Fellow of Sports Doctors Australia, and run with the expertise of other experienced and respected SDrA Fellows teaching and overseeing the skills stations. The feedback from the course was unanimously positive with participants including sports doctors, sports physicians, team doctors and sports trainers all stating that they learned valuable information and developed essential skills in managing an athlete requiring on-field emergency medical care, one participant stating that "no doctor who cares for athletes can afford not to do this course".

Although the course was designed and accredited with SDrA for medical practitioners, the non-medical participants stated that they developed an insight into the skills and abilities of doctors who completed this course

and felt better equipped to assist the doctor with on-field emergency care.

Given the more serious nature of sporting events and the greater demand for high quality and competent medical care at these fixtures, the course has been designed for the medical practitioner who has the responsibility for the care of athletes or sporting teams of all levels. The course focusses on the on-field management of the seriously-injured or ill athlete and involves the essential theory and predominantly focusses on the hands-on management of these conditions. It is designed around systems and skills stations, whereby the doctor becomes competent at recognising and managing serious incidents without immediate hospital backup.

Each station is sport-based, and focusses specifically on the four major systems requiring acute medical intervention. The systems covered and some of the skills learned included the identification and management of:

- Airway problems: the participants learning how to identify a compromised airway or an airway which has the potential of becoming compromised. The basics of establishing and maintaining an airway were reinforced and practiced, including cervical spine control, oxygen therapy and appropriate delivery systems, bag and mask resuscitation, inserting an oral/nasal airway, ETT insertion and LMA insertion.
- Breathing problems: the participants recognising and learning how to manage the athlete suffering from both medical and surgical problems of this system including asthma and pneumothorax.
- Circulatory problems: concerning the athlete in shock and the various types of shock, fluid resuscitation

and fracture management and stabilisation, including the use of cardiac defibrillation.

- Head and spinal injuries: the candidates learning how to assess and manage these patients, such as determining ominous neurological signs and how to immobilise a patient with a spinal injury.

Each station identified compromise and potential compromise of the system covered. It also focussed on essential intervention as well as certain contraindications to management.

The stations emphasised the basics of emergency management as well as the critical advanced medical skills required to stabilise the seriously-injured or seriously-ill athlete. To finalise, the course then tied together as a complete management model so as the participants gained the confidence and skills required.

Because of popular demand, the course will be run again at the 2005 Australian Conference of Science and Medicine in Sport in Melbourne. This will be another great opportunity for participants from last year's course to refresh their skills and other doctors to learn and practice essential lifesaving skills. Not only was it a valuable skills course; it was also a course where everyone had fun learning and acquiring the skills.

The demand for this course is high and is expected to fill quickly.

It is envisaged that future courses will aim to be multidisciplinary given the multidisciplinary nature of sports medicine care.

This course would not have been possible without the wonderful support and sponsorship of Laerdel Australia.

NEW! from Australia's leading supplier of quality magnetic products

NATURAL PAIN RELIEF

magnets 4 therapy

MAGNETIC SUPPORTS DESIGNED FOR ACTIVE WEAR

25mm 10,000 gauss Neodymium magnets in cotton lined Neoprene support



MAGNETIC HIP & BACK SUPPORT
with 6 high strength magnets
ONLY \$95.00

Lightweight and supportive, strategically placed magnets provide a complete magnetic field for maximum coverage to:

* ACCELERATE HEALING * MINIMISE SWELLING
* INCREASE CIRCULATION * SPEED RECOVERY



MAGNETIC ELBOW SUPPORT
with 4 high strength magnets
ONLY \$70.00



MAGNETIC KNEE SUPPORT
with 4 high strength magnets
ONLY \$80.00

available NOW

These products may be worn while working, playing sport or resting

For more information:
Tel: 1300 733 771
www.magnets4therapy.com.au

DESIGNED IN AUSTRALIA FROM CLINICAL EXPERIENCE

Comings, Goings, Doings.....

New AIS Director

The new Director of the Australian Institute of Sport is Peter Fricker, Medical Director of the Australian Olympic team at Athens, Deputy Medical Director at the Seoul, Barcelona, Atlanta and Sydney Olympics and prominent SMA member.

Professor Fricker has been at the AIS for more than 20 years: its first ever medical officer and driving force behind many of the medical and scientific breakthroughs behind the AIS' successes over the years.

Help call to SMA members!

The Safer Sport Program needs SMA skills

SMA members who can help SSP as it provides training in injury prevention and management and crisis management techniques are invited to contact their State offices to find out more about the skills needed, remuneration, etc.

SportScan Update

SportScan Update is a new free alerting service from the National Sport Information Centre (NSIC) at the Australian Sports Commission -- a new free monthly sport information email service that could interest sports scientists and sports medicine personnel. It lists new resources: journal articles, web documents, websites, conferences and other information identified by the NSIC that may be of interest.

To view a sample issue and to subscribe to this monthly free email service visit www.ausport.gov.au/nsic/sportscan. For further information contact the National Sport Information Centre at

- PO Box 176, Belconnen ACT 2616
- nsic@ausport.gov.au
- phone number 02 6214 1369
- fax number 02 6214 1681; or
- www.ausport.gov.au/nsic.

News from ASDA

The World Anti-Doping Agency has released its 2005 Prohibited List which came into effect on 1 January 2005.

There are two key changes in the 2005 Prohibited List from previous years:

Beta-2 Agonists (inhaled asthma medications formoterol, salbutamol, salmeterol and terbutaline) are now *prohibited at all times*. Before using an inhaled asthma medication, athletes must apply for an Abbreviated Therapeutic Use Exemption (ATUE). Sport medicine professionals should remind their athletes that using the above asthma medications requires an ATUE. ATUE forms can be found on the ASDA website at www.asda.org.au.

Glucocorticosteroids (contained in some anti inflammatory preparations) applied via skin creams are *no longer prohibited* and do not require an ATUE. All other types of glucocorticosteroids remain subject to restrictions. ASDA's Hotline (1800 020 506) can provide further advice to sport medicine professionals if an athlete is required to use any type of glucocorticosteroid that is not a skin cream.

A summary of the changes to the 2005 List can be found at www.asda.org.au/athletes/wadc_list and sport medicine professionals and athletes can check whether a substance is banned or permitted on-line at www.asda.org.au/athletes/online or via phone (1800 020 506).

Structure of the Prohibited List

The structure of the 2005 Prohibited List is as follows:

Substances and methods prohibited at all times (for males and females)

- anabolic agents
- hormones and related substances
- Beta-2 agonists
- agents with anti-estrogenic activity
- diuretics and other masking agents
- enhancement of oxygen transfer
- chemical and physical manipulation
- gene doping.

Substances and methods prohibited in-competition only (for males and females)

- all substances and methods listed above plus:
- stimulants
- narcotics
- cannabinoids
- glucocorticosteroids (except when applied via a skin cream).

Substances prohibited in particular sports (athletes should check whether these substances are prohibited by their sport)

- alcohol
- beta-blockers.

New anti-doping handbook

With the 2005 Prohibited List now in effect, ASDA has released its new 2005 Anti-Doping Information Handbook, which features updated information on:

- the status of medications in sport;
- drug testing procedures; and
- requirements on athletes to provide accurate whereabouts information.

Sports medicine professionals can contact the ASDA Hotline (1800 020 506) to buy the 2005 handbook.

FIMS Membership now open to SMA Members

Membership of the International Federation of Sports Medicine (FIMS) is now open to SMA members for an annual fee of \$Aus10.

FIMS membership will provide access to the members' section of the FIMS website to connect with sports medicine and sports science professionals internationally. Membership also provides electronic access to the FIMS quarterly journal The International SportsMed Journal (ISMJ) available online at <http://www.esportmed.com/ismj/frames.asp>, plus a regular weekly sports medicine literature update service and the regular FIMS newsletter online.

Membership is to be paid as an optional amount with annual renewal of SMA membership. (All the members of Sports Doctors Australia have recently become members of FIMS through SMA)

For your Library

Karger have announced publication of a comprehensive collection of epidemiological data on sports injuries to children and adolescent athletes in two volumes edited by Professors Dennis Caine and Nicola Maffulli.

Epidemiology of Pediatric Sports Injuries (Vol 48): Individual Sports

(ISBN 3-8055-7868-7)

Covers the epidemiology of children's individual sports injuries, injuries in gymnastics, skiing and snowboarding, tennis, track and field, wrestling and the martial arts, and injury prevention and future research.

Epidemiology of Pediatric Sports Injuries (Vol 49): Team Sports

(ISBN 3-8055-7869-5)

Covers the epidemiology of children's team sport injuries, injury prevention and future research, and injuries in basketball, rugby and soccer (now football), as well as North American specialities such as gridiron, ice hockey and baseball.

Details are available from DA Information Services at 648 Whitehorse Road, Mitcham, Victoria 3132 in Australia or www.karger.com/mspsc.

Wanted

Sport Health Digest Editor

Responsibilities: To compile a brief digest of recent publications (journals, books, websites, etc) for each issue of Sport Health.

Please send your details to:

The Editor

Sport Health

Sports Medicine Australia

PO Box 237

Dickson ACT 2602

smanat@sma.org.au

Sport Health regrets that the obituary tribute to Dr Bill Webb has had to be held over until the Winter issue.



acsms program update

"Promoting Innovation, Measuring Success"



13-16 October 2005, Melbourne Convention Centre

Australian Conference of Science and Medicine in Sport (13-16 October 2005)

Fifth National Physical Activity Conference (13-15 October 2005)

Fourth National Sports Injury Prevention Conference (15-16 October 2005)

giving delegates the entire panorama of sports medicine, sports science, physical activity promotion & sports injury prevention in one dynamic event.

speakers

Thursday 13 October

- Roald Bahr
- Billie Giles-Corti
- Chris Tzar
- Shona Bass
- Stuart Warden

Friday 14 October

- Karim Khan
- Willem van Mechelen
- Jo Salmon
- Shane Brun
- Heather McKay

Saturday 15 October

- Kevin Kirby
- Shona Halson
- Craig Payne
- Irene Davis
- Michael Makdissi
- Adrian Bauman

Sunday 16 October

- Jill Cook
- Louise Burke
- Leonie Otago
- Scott McLean
- Shane Hamblin

symposia

Thursday 13 October

- Bone Health and Exercise
- Exercise Prescription and Delivery - who should do it?

Friday 14 October

- Physical activity & nutrition: influences on child and adolescent health
- Policy and Government

Saturday 15 October

- Overuse injuries, forces & foot orthoses
- Vascular
- Active Transport

Sunday 16 October

- Hydration
- Type 1 Diabetes
- Community Forum (Risk Management)

workshops

Thursday 13 October

- Practical Procedures for the Practice
- Commonwealth Games Workshops
- Risk Management for Sports Physiotherapists

Friday 14 October

- On Field Emergency Medicine
- Is your patient's bra a help or hindrance
- Functional Fascial Taping

Saturday 15 October

- Back Health on the Ball
- Joint Injection Techniques
- Exercise Prescription

Sunday 16 October

- Posture Pilates Class
- Skin Closure Techniques
- Treating the Athlete's Pelvic Floor



Australian Government
Department of Health and Ageing



Victoria
The Place to Be

Conference Secretariat - Sports Medicine Australia
PO BOX 227, MELBOURNE, VIC 3000
P +61 2 4222 4630, F +61 2 4222 4948
E conferences@sm.org.au
W www.sm.org.au (13-16 Oct 2005)

Apology

The Editors of Sport Health apologise to readers and the authors for the omission of part of the list of references cited in the article "Uncovering the secrets of The Don: Bradman reassessed" which was published in Volume 22, Issue 4, Summer 2004-05.

We publish the full list here.

References

- Dickson G, Mummery K, Arnold T et al. Legends at the crease: changes to the performance variation of Test cricket batting performances 1877-1997. *Sport Management Association of Australia and New Zealand Conference*. Gold Coast. Griffith University. 1998.
- Gould SJ. *The Structure of Evolutionary Theory*. Cambridge, MA. Harvard University Press. 2002.
- Hutchins B. *Don Bradman: Challenging the Myth*. Cambridge. Cambridge University Press. 2002.
- Bradman D. *The Art of Cricket*. London. Hodder & Stoughton. 1958.
- Williams AM, Davids K & Williams JG. *Visual Perception and Action in Sport*. London. E & FN Spon. 1999.
- Beckerman SA & Hitzeman S. The ocular and visual characteristics of an athletic population. *Optometry* 2001;72:498-509.
- Shillinglaw AL. *Bradman Revisited: The Legacy of Sir Donald Bradman*. Manchester. The Parris Wood Press. 2003.
- Andrew K. *The Skills of Cricket*. Marlborough. The Crowood Press. 1992.
- Bernstein NA. *The Coordination and Regulation of Movements*. Oxford. Pergamon Press. 1967.
- Beek PJ & Meijer OG. On the nature of 'the' motor-action controversy. In *Complex Movement Behaviour: The Motor-Action Controversy* (Ed: Meijer OG & Roth K, pp. 157-185). Amsterdam. Elsevier. 1988.
- Kelso JAS. *Dynamic Patterns: The Self-Organization of Brain and Behavior*. Cambridge, MA. MIT Press. 1995.
- Davids K, Williams AM, Button C et al. An integrative modelling approach to the study of intentional movement behaviour. In *Handbook of Sport Psychology, 2nd Edition* (Ed: Singer RN, Hausenblas H & Janelle C, pp. 144-173). New York. John Wiley. 2001.
- Thelen E & Smith LB. *A Dynamic Systems Approach to the Development of Cognition and Action*. Cambridge, MA. MIT Press. 1994.
- Newell KM, Liu Y-T & Mayer-Kress G. Time scales in motor learning and development. *Psychol Rev*, 2002;108:57-82.
- Newell KM. Change in movement and skill: learning, retention and transfer. In *Dexterity and its Development* (Ed: Latash ML & Turvey MT, pp. 393-430). Mahwah, NJ. Erlbaum. 1996.
- Davids K, Glazier P, Araujo D et al. Movement systems as dynamical systems: The functional role of variability and its implications for sports medicine. *Sports Med* 2003;33:245-260.17. Savelsbergh GJP & Bootsma RJ. Perception-action coupling in hitting and catching. *Int J Sport Psychol* 1994;25:331-343.
- Glazier P, Davids K & Bartlett RM. Grip force dynamics in cricket batting. In *Interceptive Actions in Sport: Information and Movement* (Ed: Davids K, Savelsbergh G, Bennett SJ et al, pp. 311-325). London. Routledge. 2002.
- Williams C. *Bradman: An Australian Hero*. London. Abacus. 1997.
- Murray P & Shukla A. *Sachin Tendulkar: Masterful*. Adelaide. Murray Publishing. 2002.
- Ezekiel G. Schoolboy prodigy. *Hindustan Times*. 2002. Available at <http://www.hindustantimes.com/news/specials/sachin30/gulu1.htm> (last accessed 2 October 2004).
- Tendulkar on the syllabus. www.IndianCricket_net-h.htm (last accessed 23 August 2004).
- Renshaw I. Perceptual skill in cricket batting. *Paper presented at the 31st Australasian Experimental Psychology Conference*. Dunedin. University of Otago. 2004.
- Delay D, Nougier V, Orliaguette JP et al. Movement control in golf putting. *Hum Movement Sci* 1997;16:597-619.