

Drugs in Sport

by

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The Chairman of the meeting was The Honourable Justice
Murray Kellam.

Drugs and sport is a constantly changing and dynamic field. The talk I'm going to give tonight is already different from the talk I would have given back in January prior to the World Swimming Championships where we had several controversial matters. It is probably one of the most challenging topics for me just to try and keep up with what's happening around the world. I come from a background as a participant, in the 1970s and the early 1980s; an era when drug use was prolific, and very poorly monitored and poorly tested for internationally. As a medical student, as I was in those days, I was disillusioned with the attitude of officials.

We have a tremendous heritage of sport for sport's sake; sport in the pure and natural state, if there is such a thing. I participated in the era when it was the Victorian Amateur Athletic Association, the VAAA, which subsequently became the Victorian Athletic Association, part of the Australian Amateur Athletic Union. All those titles with "amateur" have gone out the door, for many correct reasons, but in the days that I was participating at an international level, there was a far from amateurish approach. I want to take you on a little journey through my knowledge and my experience of the way that drugs and sport have interacted, and the way sports medicine has been involved in that interaction.

The price of success in sport these days is hard to measure, and athletes are certainly striving to achieve the number one position on the podium, sometimes regardless of not only the long-term effect it might have, but also of the short-term effect it might have. If we ask the general public about factors associated with sport success, and we even ask the younger athletes, the fact that drugs appears on the list is a sad reflection on the way that sport has developed over time.

If we go back to 1960, the definition of drugs in sport would have read, "That may enhance performance," and it would have included a line that said, "Or any psychological means which may enhance performance." Sport psychologists wouldn't have been too happy because even motivational psychology was seen to be a performance enhancer that was inappropriate. That has subsequently been dropped, much to the pleasure of the sport psychologists who are now making quite a good living out of being involved in that particularly important part of sport preparation. Another more important and more poignant definition of doping is from Charlie Francis. His definition was more appropriate in terms of the way that athletes perceived it in the 70s and 80s and perhaps even now, that as long as everybody is doing the same

thing, that is not cheating, as far as the athletes are concerned. Probably that was brought home to me most markedly with the Tour De France this year. It was so well known in international cycling that to be an elite performer, to be able to perform 22 days in succession, sometimes doing five to six hours of high intensity endurance sport on each given day, sometimes rising from a thousand feet altitude to 11,000 feet altitude, and to come out day after day; you couldn't do that without being on erythropoietin or EPO, which is known to be one of the major enhancers of oxygen carrying capacity. Because everybody was doing it, it wasn't considered to be a factor amongst the teams. Amongst cycling officials it wasn't until the federal authorities got involved at the French-Belgian border and it became a customs' issue and a police issue, not a sports officials' issue that this matter was brought to the public eye.

We don't need to look beyond our own newspapers to follow the world of sport and sport drugs to see how topical this is. Sports like international cricket have introduced drug testing and my medical business partner, Trefor James, who is the medical co-ordinator for the Australian Cricket Board, has just put together a code of ethics and a code of drug testing conduct for international cricket. It is pretty much based on the codes that have been present for IOC based sports, but with a few more lenient clauses.

Recently His Excellency Juan Antonio Samaranch made a statement that attracted not only Australian headlines but world headlines, that was seen to be a significant softening of the attitude to athletes taking performance enhancing medications or drugs whereas provided it did not harm their health, he did not consider it to be necessarily cheating. It is interesting that despite all the controversy and the spin-doctors coming into play, no-one has said, "Look, that's not really what the IOC wants to say." There has not been a retraction or a clarification of that statement as it was presented in his native language to a reporter who understood his native language, and so there was no question that there was a language misinterpretation, or that is was not what he intended to say.

It certainly has highlighted that there has been a softening at the top end because of the magnitude of the task of trying to control drugs in sport; at the IOC level they perhaps realise they cannot be as tough as they wanted to be.

Let us look at the way that the drug scene has evolved. If we go back to feats of athletic endurance with Inca warriors or gladiators,

I'm sure they were quite happy to use any form of stimulant or indeed hallucinogenic drug that might have enabled them to get through some of the tasks. Their use of cocaine and other endurance enhancers has been documented. I'm sure the Christians facing the lions would have been quite happy to be using drugs to assist them in their performance; whether it was to get away or just not to be aware of what was going on. It wasn't until the 1940s and particularly in relation to soldiers and pilots that stimulants became very much used for non-medical reasons. Indeed, anabolic steroids were used by the Nazi regime for the military to develop strength, and aggression. They were developing the psychological attitude that is associated with the use of anabolic steroids, as much as the physical benefits. After World War II prisoners of war were prescribed anabolic steroids to try to overcome some of the health problems that have been associated with the wasting diseases and the nutritional problems associated with long-term internment in prisoner of war camps.

In the 1950s there was not much publicity given to sport drugs but in the 1960s there were several cycling deaths associated with the six and eight day endurance cycling events. The athletes were using barbiturates, nitro-glycerine and strychnine, a particular cocktail that was very popular amongst endurance cyclists, again as an anti-fatigue drug, and of course, that did terrible things to the thermoregulatory system. It did terrible things to the perception of fatigue, and people were suffering from hyperthermia in some of these summer-based competitions and literally riding themselves to death.

Certainly anabolic steroids were being used internationally in sport. There was no sport drug code in existence in the 1960s, so it was whatever you were able to get your hands on, and as I said, there was no testing. Because of some awareness, particularly of the 15 or 16 deaths that occurred internationally in cycling, the IOC established a medical commission towards the end of 1967, and that was ratified at the IOC conference in 1968. We're now 30 years down the line from having a medical commission driving the drug issues at IOC or international level. Drug testing was introduced for the first time at Mexico City, but only for stimulants.

As we moved into the 70s the anabolic agents became very, very popular, and testosterone became available as an ester to be also taken as a supplement. We were really looking at those sports that were the obvious strength and power sports, such as the throwing sports, the jumping sports, the shot-put and the discus. Anabolic androgenics are also referred to as AA. It's very difficult to get an anabolic steroid that

doesn't have some virilising or masculinising effects, even with the synthetic ones available. Anabolic steroids were first tested in 1976 at Montreal, which was my first Olympic experience.

In the 1970s it was the regime in East Germany that really increased the use of drugs in sport. If we look back at the history books, we see world records being set, and we see the nations that dominated international sport in that era. Certainly East Germany was well up there, as well as some other Iron Curtain countries. And we now know since the release of the Stasi files and since the Wall has come down, that there was a very, very orchestrated and medically controlled program of anabolic steroid production and utilisation, particularly in female as well as the male athletes. That is reflected in the magnificent increases in performance for some of these world records that took place in the 70s, and hence, testing did happen in Montreal, but we'll see that it wasn't all that effective.

The 80s was the real renaissance in terms of other agents, particularly the peptide hormones, such as growth hormone, which had the same benefits as an anabolic steroid agent without necessarily the obvious side effect risks. Although there have subsequently been plenty of side effects that have been shown to occur. The testing then was simply urine testing, not blood testing, so all the agents, such as the adrenal hormones, the placental hormones, human chorionic gonadotrophin, which stimulates lactic cell testosterone production, and the anabolic steroids were still very popular. We also saw the introduction in the 80's and even in the late 70s of blood substitution, where an athlete would have blood taken out of his system, stored for a period of time and then reinfused at the time, or a day or two before an endurance event. Again the blood boosting was the effect that was being looked for. Sometimes it was the athlete's blood, and on other occasions it was relative's blood that was matched and typed. Again it was seen to be a way of avoiding having to do altitude training. In the days when I was participating, we all were aware that the Kenyan athletes certainly belonged to one of the leading nations. Many athletes still do go to altitude to train to get that blood cell increase that occurs when your own erythropoietin, EPO, is stimulated by the lower level of oxygen. Blood doping was a way to get that effect and in 1984 the American cycling team cleaned up most of the medals in both the track events and the distance events. In a hotel opposite the Velodrome in Los Angeles, they had two rooms set up virtually as a mini hospital with IV infusions and nurses and doctors infusing the blood. Now with our knowledge these days of hepatitis B and hepatitis C and HIV, we shudder to think of the risks that

were being taken in those days. There are anecdotal reports about the number of deaths that occurred, particularly with cyclists in Denmark and Belgium and also with some of the Russian rowers who were suffering cerebral thromboses and other thromboses associated with the increased blood thickening and viscosity that occurred when they didn't quite get the dose right.

In 1984 blood doping was added to the list of IOC methods of drug taking that was not acceptable, but of course it was totally undetectable because we were doing urine tests and if somebody were reinfusing their own blood, how the heck would you know? It's just that they found out about it so they put it on the list, but it was still undetectable.

Beta-blockers were also being used. Beta-blockers have a traditional medical use particularly in cardiovascular medicine, and particularly in hypertension treatment, as well as other areas. It does slow your heart rate down so shooters, archers and people in modern pentathlon used them. They normally shoot between heartbeats and so the steady hand, the longer they have, the more of a bradycardia they have, the longer they have to aim and shoot between heartbeats. Being on the beta-blockers achieved two things. It gave them a very slow heart rate; it also cut down on nerves. As those of you from medical student days will know, it was a popular thing for medical students to be using to cut down on tremor and nervousness, and still is used to some extent. Beta-blockers were banned in 1984 unless a medical certificate was produced. In 1988 there were five members of the British modern pentathlon team, average age 22, who produced medical certificates to say they were being treated for hypertension with beta-blockers. Subsequently beta-blockers have been banned because it's believed there are other ways to treat hypertension more successfully. That's one of the bases of the way the drug code works. You have to prove that the drug you're on is the best choice, if it happens to be on the banned list, and there is no other choice available for that drug. For example, you may have an attention deficit disorder which is quite a controversial medical condition, but nevertheless is paradoxically treated with amphetamines. Of course in sport, amphetamines are naturally banned as stimulants, but there is evidence to show that they are the best treatment available for attention deficit disorder, and then therefore athletes can get permission to use them.

In the 80s we saw other things added to the doping code. There were restricted classes such as the use of local anaesthetics, marijuana and alcohol, just to give three examples, where they were acceptable in certain sports and not in other sports.

Masking agents initially were there to hide the drugs that may be taken, and diuretics were the most commonly used masking agent in the 80s because they weren't on the banned list. They weren't considered to be performance enhancing drugs, so no-one had thought to put them on the banned list, and suddenly all these athletes were turning up with Lasix and Chlotride and other things on their urine test which weren't banned so they couldn't be caught. They had used diuretics to flush out the other drugs that they were using, and other masking agents such as Probenecid, which was used traditionally to prevent the excretion of antibiotics when we're treating infections in patients, but they do also prevent renal excretion of many drugs. This was another way that athletes were able to prevent themselves having positive tests. Masking agents were on the banned list by 1987.

But the IOC plays catch-up. They are finding out about things and only adding them to the list a decade later after a generation of athletes have been using a particular method.

The drug code didn't particularly specify as to whether you had to produce a urine specimen, you just had to produce a specimen, so people were turning up to tests with orange juice, apple juice, and other things like that. In 1987 it was specifically written into the code.

Substitution means putting someone else's urine in your test. In the 80s when you didn't have chaperones and you didn't have to be physically observed passing the urine specimen by a female chaperone for a female athlete, or a male chaperone for a male athlete, you were given an hour's notice. When I had my tests done in the 70s and 80s, I was handed a piece of paper, "Peter, you've got to report for a test in an hour's time," and you just turned up in a room in an hour's time and provided a specimen or brought the specimen with you. It was not observed so it could have come from anywhere. Substitution involved producing urine from your mother or your grandmother or your coach, or your coach's wife. Since the introduction of chaperones and being accompanied from the time you were told that you have to have a drug test, you are literally shadowed by the chaperone. These days after AFL football games when ASDA is testing, they go into the showers, they go into the toilet, they literally follow the footballer around - I've observed it many times and it is the same as with athletes.

Yet some female athletes were using either condoms or other forms of plastic balloons in the vagina and were able to produce someone else's urine despite being observed to produce a specimen under visual observation.

In 1988 the drug code added peptide hormones because of the awareness that in the early 80s synthetic growth hormone became very much available. Before that it had been growth hormone from the pituitary gland from a cadaver, which is very, very expensive for athletes to get hold of. They were also using Rhesus monkey growth hormone for a period of time, but there wasn't enough effect in a cross-species situation. That still occurs at the moment with a lot of the peptide hormones being derived from animals, but are not effective in the human, but athletes still don't believe that. If they think it's going to work, they still want to use it.

In the late 80s, out-of-competition testing also came along and we started to test athletes other than at predictable times. That was the key to some of the successes that have been achieved in terms of positive tests. Everybody knew if you were being tested at a set time, if you were halfway smart, how to have a clear system at the time of a competition, and that still applies now. And given that when you look back to the 1970s and 80s you had biochemists, pharmacologists and medical practitioners supervising the drug programs, it was very easy for athletes to know when the drug was out of their system. It's much harder if you get a knock on the door at 11 o'clock at night at your home, and hear, "I'm from the drug agency. I understand you're on the elite program." There are about 4,000 athletes now on that program around Australia whether they're hockey or rowing or tennis or whatever, and they have to provide a specimen immediately. That was one of the keys to some of the changes that took place.

Finally in the 90s we've seen testosterone become more available and used because it's very difficult to detect. Everyone makes testosterone, a lot of athletes who had high testosterone levels said, "Hey, I'm an athlete, I'm just a horny guy, and that's why my testosterone is high." We did not know the normal levels of testosterone in aggressive athletic males. Hence the concept of the testosterone-epitestosterone ratio was introduced in the early 90s as the way of testing people with abnormally high testosterone. If you're actually producing your own, your precursors or epitestosterone will be high as well, and your ratio will be around one or two.

To get a ratio of three or four is quite abnormal. In fact the legal limit is six, so there's a leeway of almost twice what you're allowed to have. Many athletes, I believe are still taking testosterone supplementation, keeping their TE ratio at four or five. There has been a push to get that level down to four, but again, on legal advice, it's been said that it is still important to keep it at six.

The peptides, glycabrokinings and analogues have come along; the stimulus to improve performance is still there. EPO is now available as a recombinant to human EPO, and is totally undetectable again because it's not excreted in the urine beyond the first couple of hours. Athletes are taking this weeks ahead of the time from when they want to get the benefit from it, so we can't pick it up.

Following our history path, I wanted to refer to 1988 and Ben Johnson and the world records. At the time Ben was pleading innocent and wanted to run in Barcelona, and there were all sorts of stories; his drinks were spiked, someone else had got to his specimen, or he took the medication for injury. From photos of Ben in '84 when he was an international athlete, and Ben in '88 when he was also an international athlete, something had changed other than the brand of muesli that he might have been eating for breakfast, I would suggest, and the times he was running in '88 compared to '84 were nowhere near comparable - the improvement was substantial. He did get back after two years which is a story in itself because I believe he was someone who'd been taking anabolic steroids over eight years. He earned about \$3.6m US dollars during that time from his athletic endeavours and he was spending an average, about \$200,000 US dollars a year on drugs, so for him to be able to come back as he did, to want to run in Barcelona, to me showed that the sanctions were not working to the extent that they should. Ben was not the brightest spark on the athletic world. He got caught a second time, and of course he got a life suspension. Not only that, but his doctor, Jamie Asterfan who was involved with him in the Caribbean and looked after a lot of other Caribbean athletes was subsequently charged with using cocaine-laced steroids, selling them and trafficking in them.

If we look at the reason why athletes may take banned drugs, performance pressure is always at the top of the list. There is so much to gain these days from being an elite athlete, and athletes who are motivated to do well put pressure on themselves to do that. Peer pressure is also a big factor because many athletes know that there are drugs being used that are not detectable by urine testing. For instance, during the 70s and early 80s when EPO and the peptide hormones were being used, growth hormone particularly, athletes were told and reassured by their medical people that they couldn't be detected. If they knew that someone else was taking it, of course they're going to take it, because they want a level playing field whatever that might be.

The coach may be putting pressure on many athletes because of his tenure appointment, particularly in American colleges and American

high schools, where coaches are employed on their success rates. If their team's not winning, they don't keep their job. They will often put pressure on their charges to do well, as indeed, do some of the Iron Curtain coaches. The same pressure is on Australian coaches, even now. If you're not doing well with your hockey team, your rowing team, your netball team, I'm sure it would be looked at in relation to your tenure. We've only got to see what happens in AFL football to know that the life of the coach is not necessarily a happy one.

Certainly government has placed performance pressure on athletes. Perhaps less so now that we don't have Eastern European countries performing as they used to and perhaps government regimes aren't quite as sophisticated sports wise as they used to be. In the past East Germany was the ideal example of where the government was involved. The athletes were the pawns in that regime because many of them did not have a say in what they would use. If you are lying down on a massage table having a rub down by the massage therapist, or your coach, and somebody comes in with an injection and tells you it's a vitamin and just shoves it into your buttock and says, "This is what you need to recover better for your harder sessions coming up in two days time," you're not going to challenge that as an athlete. That's the way the East German system worked. The athletes themselves didn't seek it out. But you have to understand the privileges that were associated with being a lead athlete in those particular regimes. Having an apartment that was paid for, perhaps having a car to drive around when you were at home and having US greenbacks in your pocket because you got to travel and participate in some of the meetings in Europe and the States where the money being won in these amateur sports was in American dollars. Your family also benefited because it may have received a State apartment or a job because you were the world champion or you were the best in the country. The athletes were certainly driven to participate but they weren't necessarily initiating the system in which they participated.

Sport puts performance pressure on athletes doesn't it? I mean every sport wants to continue to be a high profile sport if for no other reason than sponsorships that they want to attract. The sport is looking for the people to perform better all the time in whatever that sport may be, and so they are always putting pressure on their athletes. There are other factors like sponsors and commercial interests. No sponsor wants to have a sport or a team that is not successful, they withdraw their sponsorship from the less successful teams and that filters down in terms

of the drug situation. Obviously where athletes are not performing up to their ambition they can be tempted to do that. If they think they are training hard, they've got the right nutrition, they've got the latest pair of running shoes that they need to have and they're still not doing well, they may be looking at other things to improve their performance.

The influence of the gym is significant and this leads us to the use of sport drugs outside of the sporting situation and into our community whether it's by teenagers or whether it's by people who want to get the body beautiful. The source of a lot of the illicit drugs in this country and indeed in many other countries around the world is not through pharmacists, it's not through you or me, it's actually through black market sales. Often they are marketed through the muscle gyms where the world of body building and weightlifting traditionally has been one that's been very much associated with at least the anabolic agents and the growth hormone and other ergogenic aids. Athletes are now spending a lot more time training, and weight training and strength preparation becomes a big part of training regardless of whether they're an endurance athlete or not. In sports like rowing and hockey and tennis where weight training is encouraged all the time, they are rubbing shoulders with this crowd of people and being influenced.

Ignorance is also a factor. If we look at many of the so-called positive drug tests that we've had in Australia in recent times they have often been cases of athletes inadvertently using preparations that are on the banned list and the athlete or the prescribing doctor claims ignorance. In the past an Australian doctor prescribed Probenecid to an international champion, a world record holder, to help him with his tonsillitis and the athlete failed the drug test because the doctor or the pharmacist had not been updated.

There is really no excuse for any of this these days, because in Australia over the last decade we have had the most sophisticated education system in place, not only for our elite athletes but also for our junior teams. So from the moment someone is identified as an elite athlete, they are exposed to lectures, to seminars and to literature. If you've been at the AIS or any of the VIS or other sports institutes around the country, you are just bombarded with information to say you do not take medication unless it is listed in the book as the permissible medication or you check it out with your team doctor. And if people follow that very simple principle, there wouldn't be the issue of having to argue, "Well, look, he didn't mean to take it, it was inadvertent, it's not really a performance enhancer, he had a genuine therapeutic

reason.” These are all genuine arguments but as long as we’ve got a particular code in place that is relatively black and white and sanctions are associated with the code it’s very hard to argue ignorance in the 1998 setting.

Injury is another one and the Justin Charles example would be the clearest one we’ve had of that. We heard Ben Johnson claim he took a drug for injury, but I doubt that that was probably the case. I genuinely believe Justin Charles was taking anabolic steroids because he wanted to get his career back on track from the substantial injuries he’d had. The point is that the code does not allow for that. It does not allow for anabolic steroids to be used to allow you to get over a sore hamstring. The fact is you will get benefits elsewhere other than your hamstring if you take anabolic steroids. The anabolic steroid doesn’t know the difference between a sore hamstring and a normal hamstring and a normal deltoid muscle or a normal calf muscle. It will give you performance benefit for theoretically months beyond the time that you’ve taken it for the short course. And so hence, there can be no leeway to allow for the use of anabolic steroids, I believe, in the treatment of injury or indeed other performance enhancing drugs in the treatment of injury, unless that athlete is subsequently banned or eliminates themselves from being involved in that sport for a period of time. That is determined by the appropriate biochemists who can tell us how long it will be before the effect of that drug will be out of that system. The veterinary industry is ahead of us in this field. Of course, in the world of sport where we’re talking about very big money and very big dollars, there are certain sports where there have been a number of unfortunate deaths of very elite athletes, particularly with cocaine, particularly in some of the American sports.

We talk about the rewards of sport and we talk about the motivation. NBC has paid US millions of dollars for the TV rights for the forthcoming Olympics. We know what they paid for Atlanta and you can see how there has been an exponential increase. In 1996, \$456m - this is just NBC, this is not McDonald’s or Coca Cola or other people like that who are also paying the IOC. This is all IOC money. About \$680m of advertising sales was brought in on top of that. So it’s about \$20,000 per competitor in 1996 money. NBC has done a deal with the IOC where they were paid 3.5, and this is billion dollars, for the television rights for the Summer and Winter Olympics until the year 2008. That’s just TV rights. That’s not advertising revenue or anything else. We’re talking big money at the IOC level. A very powerful body

when it comes to sport in the world. What I'm leading to here is the motivation and rewards and why people take the risks.

This slide shows some of the top earners in US millions of dollars for a variety of sports. If you're looking to pick out what sport your child or your grandchild goes into, here's your chance to do that if you want to be well kept in your retirement. This is endorsement money, this is not income from winnings at tennis or winnings at competition, with Michael Jordan again the top of the tree, \$40m US per annum. This is to endorse Nike, to endorse Gatorade or to endorse Titleist golf balls, and he's not even a golfer.

On a more local scale, this slide shows the per annum Australian dollars declared income for some of our better-known footballers. When I say declared income, I think you know what I mean, because there are many other loop-holes and many other assistances with houses and cars and jobs and wives' jobs et cetera that contribute to these figures being perhaps as much as double that. If you look at some of the AFL trading going on this week, those of you who have an interest in sport will know amount of dollars that are being talked about. Million dollar deals are the standard that the more elite athletes are trying to do for themselves. That might be a two-year or three-year deal. A deal has just been done for about \$1.8million.

When it comes to drug use, one of the things as medical practitioners we've always had to deal with is the way that certain of these drugs have a reputation well beyond the deserved reputation for the performance enhancement they may give. And again, it comes down to vulnerability of the athlete if they think something is going to help. There is an enormous amount of fiction that comes into some of these nutritional supplements and things that athletes are taking. One of the duties I have as a sports physician working with elite athletes and even the junior athletes, is to put a perspective on that for them; to make it clear that they are wasting money or wasting time on many of the even legitimate supplements that have no scientific basis to performance benefit. The reality versus the myth is certainly prominent. We have so many things that are on the market. I just picked these up in the States on my most recent trip, just by walking into a health food store. This is the drug that Alistair Lynch took in the tremendously controversial case we had recently. It is just two steps away from testosterone in the metabolic pathway of androgens and yet it's available over the counter in a variety of strengths. I bought this for about \$12.95 US. My point here is it's easy to see why some of the athletes who are taking some

of these herbal preparations or the ginsengs and so on, can turn up a positive test. The purity of some of these is questionable. I've got no idea what "whole pituitary" would contain and I don't know what "prostate" has got in it that might be a performance enhancer. Who knows? And "raw testicle", I'm not sure exactly but presumably there's testosterone there as well. I didn't go to the factory to have a look of the production of this and I certainly didn't volunteer. Whether it's this particular agent or any other body building agent you can see why it's easy for an athlete to tip into a positive test when they are being sold something which is a nutritional or a multivitamin and you can do these on mail order. Again, it comes down to that education process with the athletes where they're told not to put a Smartie in their mouth unless they check to see whether in fact it can be tested. I have one particular elite athlete who is always travelling the world and I get phone calls from her at my practice at ungodly hours and she is just so good at not taking anything at all. She will ring me up about the most stupid things, but I'd rather that happen than her getting to a situation where she is taking something that is going to tip her over. Because of the travel that's associated with international sport these days, people are buying products not necessarily with English labels, the same name product in Australia may have a different compound in it when you buy it in France or when you buy it in the States. We can't assume that because something is available in Australia in a certain strength or a certain composition that it will be okay.

So this is the way the IOC works; it has a doping code, they have classes of doping drugs, they have methods of doping and they have restricted substances. The doping classes are primarily five types of drugs. The first two are the stimulants which are all basically on the amphetamine or barbiturate group and the anabolic agents which are all derivatives of testosterone in some form. Then they list diuretics specifically because of the amount of diuretics that are used not only as masking agents but also in all those sports where you have to make a weight limit, such as wrestling, rowing or boxing. Then they list the narcotic analgesics such as morphine, pethidine and the opiate derivatives. It used to be that codeine was included on this until a submission was put forward in 1996 to suggest that the strength of codeine used in cough mixtures or Panadeine or Panadeine Forte was not particularly performance enhancing and codeine is now allowed in international sport. The final category is the growth hormones and the human chorionic gonadotrophins and EPOs.

Blood doping as a method of performance enhancement went out

of vogue in the '90s as have the various manipulations, either physical manipulations of scooping water out of the toilet bowl and using that as the particular agent, or as I said, using your coach or your mother or your grandmother's urine instead of your own or trying to alter the pH to try and trick the biochemist.

The main restricted substances are not tested for in all sports but are tested for in certain sports. Alcohol tests for shooting for instance. Marijuana is also tested for. There was a controversial case of Ross Rebagliati this year who tested positive after having won the inaugural gold medal in the snow boarding at Nagano. My wife and I were at Whistler at the time watching all of this and we used to walk down the street and smell the marijuana coming out of the condominiums and coming out of the buildings. It's hailed as the marijuana capital of Canada and they're quite proud of it. Even though British Columbia has very substantial legislation and marijuana's not legal, everyone was saying when Ross was found guilty, "Well, of course, it's because he lives in Whistler and everybody smokes dope in Whistler." And they were quite proud of the fact that Whistler had the strongest dope in Canada.

Local anaesthetics are allowed in sport. Corticosteroids are allowed by inhalers for asthma. They're not allowed in oral form but they are allowed in injectable form as an anti-inflammatory. They're restricted in certain usages and athletes who are using these agents have to provide medical certificates at the time, so they can be used therapeutically. Oral corticosteroids are not allowed to be used because of the potential effects of euphoria and anti-fatigue, but special permission may be sought for patients who again can substantiate that corticosteroids are the most appropriate treatment for their inflammatory bowel disease or for their thrombocytopenic purpura or whatever disease they may have. All asthmatics have to provide a certificate by a respiratory physician to say that they are a genuine asthmatic, they have been tested in the laboratory and they require beta blockers such as Ventolin or other forms of broncho-dilators.

Caffeine, as we know, is allowed up to a certain limit, so coffee and a bar of chocolate and Coca Cola can be consumed. Imagine what the IOC would do if Coca Cola was banned. You're only allowed 12 micrograms per ml. This was the first case of a drug having a quantitative amount being allowed. There have now been other drugs where quantitative amounts in the urine have been permitted. We have our own celebrated case of Alex Watson who was doing the modern pentathlon, the cappuccino kid as he became known, who had

a caffeine level of 43 and 47 micrograms per ml on his urine testing at the Olympics and was subsequently disqualified and thrown out of the village. He protested his innocence for quite some time and until this day still does.

In recent times, the Tour de France showed that many drugs were being used that were not detectable on the standard test and were being used and administered and monitored by medical staff, by the massage staff and by the administration staff of teams. It was the unwritten code that it was acceptable because everyone else was doing it.

The Chinese have had their share of publicity in January this year when we again had four Chinese athletes who were caught using diuretics and suspended. They weren't actually caught using performance-enhancing drugs but, again, as you've already heard, diuretics are on the list. Again they were not caught using anabolic steroids, you can't get caught using growth hormone. You might remember the thermos flask of growth hormone that was picked up at Customs. One of the athletes was bringing growth hormone into Australia for purposes undetermined although they said they were going to sell it to a Chinese doctor in Canberra who was using it for such and such and it wasn't for the team. But we do know that China at least has had access to the same contemporary drugs as the rest of the western world. There have been enough positive cases where the Chinese athletes have been caught by random testing by other international bodies.

With the release of the Stasi files in East Germany we now have doctors who have been prosecuted by former athletes because of the side effects, particularly in female athletes, as a result of administration of anabolic steroids in the 1970s and '80s. It has even got to the point where there has been a number of athletes who have undergone a sex-change from female to male because they have such a substantial masculinising effects from these drugs. Charges have been brought against the coaches, particularly in swimming, but in three other sports as well now.

Currently we've had our own cases here. We've had the case of Richard Upton, who tested positive for Probenecid which was prescribed by his family doctor in Australia in 1998. Even we are not squeaky clean. We had our own controversial issue in swimming with Sam Riley with Digesic, dextropropoxyphene, subsequently taken off the list. Because this list is so enormous I haven't even attempted to show it to you. Many of the drugs at a therapeutic level are not performance

enhancing and this is one of the directions that we believe that the IOC was probably heading for when Samaranch made his comments, he just didn't make it very clear as to what he was intending to do.

Having got rid of these types of drugs there are many others that the chemists are coming up with which aren't on the list yet. It's an established fact, an unfortunate reflection on sports ethics that so many of the wonderful performances that we all grew up with in terms of the '60s and '70s and even into the '80s have subsequently been seen to be drug assisted performances.

Whether we go back to the German regime, to Scandinavia or China in the '90s, then I just wonder where we're heading for in the Year 2000 in terms of the games here. We have seen recent examples of this situation here. 80 per cent Irish whiskey appeared in Michelle de Bruin's urine sample so maybe she was on a wonderful weekend of drinking. She had been under suspicion, as you know. She was a swimmer that came out at the Olympics and won medals after having been an international athlete for a number of years. At age 28 you wouldn't expect the performance in a swimmer to increase that much.

There was also guilt by association in that her husband had been a banned athlete for anabolic steroid use. That doesn't make her a user, but it did create a story.

Probably one to mention in most recent times is Florence Griffith Joyner who still has the world record by five metres in the hundred metres for women, still faster than the national record of several male national records for countries around the world at the present time. She was a girl of the '80s. She was in the era where the peptide hormones were being evolved and while she certainly passed every drug test that she had, that still doesn't mean that she wasn't taking something, because there are so many agents that aren't showing up. I think her death recently has created a great ripple and perhaps even more than a ripple through the sports world. It is very important that the coroner's report and the actual details of the cardiac death that she had are brought to the public eye to answer the question once and for all. Her physique and body shape changed substantially, and we do know that in the acromegalics that do have excessive growth hormone, one of the commonest causes of death other than diabetes, is cardiomyopathy and heart failure associated with the excessive use of growth hormone. So whilst the speculation is there, it is very important that we be more definitive in being able to say what are the problems associated with some of these drugs.

There is a drug testing protocol. As I said, 1968 was the first testing, in 1976 anabolics came along and in 1991 at the international level random out-of-competition testing came along. This has been the most important thing in the reduction of incidents. We really lead the world in this area - we have the highest percentage of out-of-competition testing. There are several other countries like Britain, Norway and New Zealand that are following suit, but most of the countries in the world still do not do this out-of-competition testing on a regular basis. If we look at the number of tests done around the world by IOC laboratories in the early '90s, you can see that one to two per cent is the number of positive tests that were being detected by urine tests. It hasn't changed much over that time.

The first Olympic testing in 1968 only tested for stimulants and there was one positive case. In Munich there were seven cases. In Montreal you see the appearance of the anabolic androgen tests where 275 were done and they had eight positives. In Los Angeles they had a lot of anabolics, not many stimulants and you can see the pattern right through to Atlanta in relation to the number of tests. Since 1984, all tests include anabolics and stimulants. In Australia we've gradually been doing more and more tests over time. That reflects some of the non-Olympic sports that have come on line, such as the AFL and the Rugby League. ASDA is a government body bound by legislation and it is based on the IOC code and many sports now utilise it. The total number of positive tests up until last year shows stimulants and anabolic steroids as roughly equal.

One of the concerns I have is the number of sports drugs that are getting into the community, whether it's through the gymnasium, whether it's in the occupational areas like bouncers at nightclubs, in some of the security services or the military or even in the entertainment industry where the body beautiful is an important thing. We do know that the people who are trafficking, the people who are smuggling and producing these drugs now have a much larger and more lucrative market outside of competitive sports people, right across the ages.

My feeling about why we should outlaw doping in sport is pretty straightforward. If you believe in the true ethic of sport, that is you get with your natural talent, you train hard, you eat the right sort of food and get your brain right around it, that's how sport should be. I'm very old fashioned when it comes to that, and I'm sure some of you in the room would share that with me. I think if everybody had that same ethic we wouldn't have the concerns about having to talk about the

health risks of these drugs.

The legal aspect is really the second most important thing simply because of the huge black market and smuggling. I have had to appear a number of times on behalf of Federal Customs in relation to the amount of steroids that is coming into this country. It is increasing year by year, and it's not just going to sports people. Australia is a very strong country when it comes to seizures. In 1997 there were 378 separate seizures of anabolic steroids by Federal Customs. One of the great frustrations, as many of you will know better than me, is that sanctions for trafficking in the sports-related drugs are just so light when compared with other street drugs like heroin or cocaine. Many magistrates give only a slap on the wrist. This case has been recently publicised. Two New Zealanders had nearly \$1m worth of anabolic steroids and the maximum fine was \$5,000. They left the country before they even paid that, so it's very easy for the people that are dealing in drugs to continue in the business because they are not getting put in the slammer.

I want to go into the future very briefly with you. There are many challenges that are facing the world of sport. The testing technology has to change all the time to keep up with the agents. It's not only urine testing. We have to consider whether blood testing is an invasion of personal space, such an invasion of civil liberties that it cannot possibly be introduced. I think it needs to be introduced. I think that genuine athletes are happy to have blood tests done to prove that they are clean athletes. So whilst the people that are running the laboratories are always trying to come up with more sensitive testing techniques, being able to detect agents that are very short-acting, that aren't in the system for very long is still the biggest challenge because some of these steroids are literally in and out of the system in 24 hours. The benefit is beyond 24 hours but you can't detect the agent beyond 24 hours, unlike some of the traditional 1980s steroids which were oil-based injectable steroids and could be detected for three months or four months.

One of the challenges is the public scepticism about elite performers. People are now turning away because of the stories, whether it's Michelle de Bruin or whether it's the athletes that are turning out to have positive tests. I think people, including sponsors, are perhaps becoming disillusioned.

The commercialism and money available I've already addressed and you can see how that is an ever-increasing issue. I believe there is

official apathy and I've been criticised by certain people because of the statements I've made on that but I do believe, again from the insight as an athlete and subsequently as an official on the other side of the fence, that there has not been enough action taken. The Tour de France is a perfect example of that, where the action that took place was brought about, as I said, by Federal Police and by Customs Police breaking open the issue of smuggling the steroids, and the cars that had the EPO and the steroids, growth hormone and other agents in them. It wasn't the cycling authorities that pursued that.

There's research going on all the time to develop agents that were going to assist athletes that aren't on the list or aren't detectable. Genetic bio-engineering is a big topic and again I believe that we are getting to the stage where the clever geneticists are able to identify DNA patterns on the tissue growth factors and tissue healing factors. We know that from our work in medicine where we're trying to assist people get over surgery or get over disease. I believe that has an application in normal people to improve muscle recovery, to improve muscle growth in athletes. That's frightening in the sense of how would we ever possibly be able to detect that on any test if you could somehow have your own DNA manipulated genetically, as a young athlete or as a teenage athlete, to mimic the effects of growth tissue, growth hormone or anabolic steroids without the side effects? It's a frightening area.

We have to get better at allowing doctors to prescribe therapeutic agents. We're dealing with patients and then we're dealing with athletes. All these athletes are subject to the same illnesses, the same problems, particularly with international travel, particularly with airports and confined spaces and all the viral illnesses as well as disorders like attention deficit disorder, Crohn's disease and hypertension. We are very limited with the current drug code on many of the agents that we can use because of their theoretical but not proven performance enhancing effect.

There are so many legal challenges being put to counter positive drug tests that the drug code has to be absolutely precise. Just the chain of custody of the specimen alone can be challenged, let alone the process of how the sample is collected, how it's stored, whether you have an A sample and then a B sample so that you can keep one sample aside. I haven't had time to go into the technology of that but there are many legal aspects where in order for the appropriate sanctions to be brought in or the appropriate case to be proven there has to be a watertight process followed.

Education of athletes on all the issues I talked about and on the value of the drugs or non-value of the drugs on the list of what they can or can't take becomes critical. The drug codes have to be uniform around the country and internationally. There are so many variances from country to country, what athletes can take in one country and not in another, and that is a problem at the present time. Testing, as I said, has to improve. Research on how to detect some of the peptide hormones in terms of blood testing needs to come along. Can we pick up growth hormone? Can we pick up what's normal testosterone and what is testosterone that's taken externally and can we pick up EPO?

The sanctions are far too weak. I believe we have to really hit hard to make examples of the people who do prove to be the cheats. It's the only way we can send a strong enough message. Right now people are out for one Olympics and back for the following Olympics and that to me is inappropriate. It involves legislation, certainly regarding importation and trafficking and the Australian Olympic Committee is pushing that very strongly with the Federal Government at the moment. It is not just testing; we have actually got to do something about supply. We've got to look at ways of assisting athletes with nutrition, with general vitamin supplementation, with things that they can take to improve their performance so that the sports medicine world or the medical world is being seen to assist nutritionally. Athletes will know they are getting some positive assistance from the scientists who are trying to help them with their sport, and not being penalised all the time by the surveillance system. Hopefully athletes will not have to worry about heading away from any doctor who is providing them with medical treatment for fear that it might get them into trouble.

QUESTION: DR MARHAM. John Marham. I am an anaesthetist and I see a number of athletes from the AIS. I am often asked by them how soon can they go back to drug testing? I really don't know because I don't know how sensitive their testing is. I tell them about a week. Do you have any comments about that, please?

DR LARKINS. It depends on the agent that they have been administered as to how long it's going to be in their system, and even then it varies from individual to individual. The athletes are subject to testing 365 days a year so there is no window of exclusion because they are having surgery, et cetera, but it comes down to the therapeutic indications of what they have to take. The certification has to be provided from their surgeon or their physician or you. If you were administering for instance a narcotic you would know that the half-life

is not going to be all that substantial, but the drug agency is entitled to turn up in hospital and test somebody who was there overnight. I couldn't imagine that happening, as none of the anaesthetic agents are on the banned list.