

# A doping sinner is not always a cheat

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The doping rules these days are really tough. The basic principle is: first offence gets a 2 year ban, second offence a lifetime ban. Everyone seems to agree that doping is cheating, and those who cheat should be sanctioned, so if an athlete provides a positive sample in any sporting situation, the inference must be that they are cheating. Unfortunately, both for the athlete and the anti-doping system, that is not always the case.

The International Tennis Federation (ITF) is very open and transparent about all their past positive doping cases and publishes them on their anti-doping website ([www.itftennis.com](http://www.itftennis.com)). There were 40 positive findings in the 5 year period 2003–2007, but it appears that in only 13 of the 40 cases was a prohibited substance taken to enhance performance. In all the other cases (67.5%) it was accepted at the independent hearings that there was “no intent to enhance performance” (19) or “no (significant) fault or negligence” (8). The breakdown is shown in table 1.

Let us look at these findings more closely.

## SUBSTANCES FOUND IN THE TESTS

### Anabolic agents and refusals

These cases ( $n = 6$ ; 15%) were mostly found at the start of the review period (2003–4), although one refusal was reported in 2007.

### Social drugs

Social drugs made up 20% of the cases ( $n = 16$ : 11 cases of cannabis, 5 of cocaine). The general discussion here is not about performance enhancement but about the potential damage to health. What most people do not know, however, is that the use of cannabis is not banned outside competition. As the active metabolites are fat-soluble, they are stored for a lengthy period in the body, and tetrahydrocannabinol, the active component of cannabis, can be detected in a urine sample up to a month or more after use. Hence, even if an athlete strictly adheres to the World Anti-Doping Agency (WADA) rules, and only consumes

cannabis outside competition, they can still test positive if they provide a urine sample at a competition a month later.

### Stimulants = 6 (15%)

Stimulants made up 15% of cases ( $n = 6$ ). When we look at the results, three cases are striking.

#### Case 1

A player was prescribed modafinil for jet lag by his doctor. The athlete and the doctor checked the trade name, but not the generic name of the product on the WADA Prohibited List. The player was banned for 14 months.

#### Case 2

A player took isometheptene, a common over-the-counter medication in his home country, for headaches. The National Olympic Committee of his country had issued a booklet in which it stated that isometheptene (known as neosaldina) was permitted, but it was in fact on the WADA prohibited list. The strict liability rule was applied, and the player was banned for 2 months.

#### Case 3

A wheelchair tennis player took a stimulant (adrafinil) in combination with valium and oxybutinin. This had been prescribed by her general practitioner for a prolonged period before she started to play wheelchair tennis. It was accepted at the hearing that any performance-enhancing effect of the adrafinil would have been counteracted by the valium and oxybutinin, and that there was no intent to enhance performance. The player was banned for 2 years.

**Table 1** Breakdown of drugs in the 40 positive findings 2003–2007

Substance found	Cases, n
Social drugs	16
Stimulants	4
Anabolic agents	4
Beta-2 agonists	3
Diuretics	3
Corticosteroids	3
Finasteride	2
Refusals	2

## Corticosteroids

Corticosteroids were present in 3 cases (7.5%). These drugs are commonly prescribed all over the world. In the Netherlands, 9.2 million prescriptions are written each year for corticosteroids alone.<sup>1</sup> These prescriptions are used by 14.7 million people (excluding patients in hospitals), a ratio of 626 corticosteroid prescriptions/1000 people. Furthermore, four double-blind, placebo-controlled studies have shown that there is no performance enhancing effect of corticosteroids in healthy, elite athletes.<sup>2–5</sup> Only in one study on recreational cyclists was a small increase in endurance time noticed when the study group was performing at a submaximal level (70–75%  $\text{VO}_{2\text{max}}$ ).<sup>6</sup>

## Beta-2 agonists

Beta-2 agonists were found in 4 cases (10%). Two of these are particularly noteworthy.

#### Case 1

Beta-2 agonists were used by a wheelchair tennis player, who had previously been hospitalised for asthma. She took all her medical papers to the tournament with her, but because she had faxed the original therapeutic use exemption (TUE) application to the wrong address, she had no valid TUE in place. The player was banned for 1 month.

#### Case 2

The player had a TUE for the use of salbutamol, but that TUE had expired on 31 December. When he played the Australian Open 2 weeks later, he consulted the tournament physician, for shortness of breath during a match, and was given another inhaler. At the time, the player was under the mistaken impression that his TUE was still valid. He was banned for 1.5 months, and had to forfeit approximately US\$13 500 in prize money.

## CONCLUSION

The main problem is that the WADA prohibited list has increased to such an extent that if members of the general public were subject to dope testing, a considerable proportion would test positive and be branded as cheats. With the number of false-positive doping cases steadily increasing, we should critically review the products that are on the list of prohibited substances and focus on those that are truly performance-enhancing and damaging to health. Using evidence-based medicine as our aid will help prevent unnecessary branding of athletes as

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cheats, when they are in fact guilty of nothing more than administrative errors. That's what I call fair play!

**Competing interests:** None declared.

## REFERENCES

1. **Pluim BM.** Dopingregels voor sporters, een waar mijnenveld. *Geneesk Sport* 2004;**37**:58–9.
2. **Kuipers H,** Van 't Hullenaar GAC, Pluim BM, *et al.* Four weeks of corticosteroid inhalation does not augment maximal power output in endurance athletes. *Br J Sports Med* Published Online First: 14 March 2008. doi:10.1136/bjism.2007.042572.
3. **Marquet P,** Lac G, Chassain AP, *et al.* Dexametasone in resting and exercising men. I. Effects on bioenergetics, minerals and related hormones. *J Appl Physiol* 1999;**87**:175–82.
4. **Soetens E,** DeMeirleir K, Hueting J. No influence of ACTH on maximal performance. *Psychopharmacology* 1995;**118**:260–6.
5. **Arlettaz A,** Collomp K, Portier H, *et al.* Effects of acute prednisolone intake during intense submaximal exercise. *Int J Sports Med* 2006;**27**:673–9.
6. **Arlettaz A,** Portier H, Lecoq AM, *et al.* Effects of short-term prednisolone intake during submaximal exercise. *Med Sci Sports Exerc* 2007;**39**:1672–8.

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**Table 1** Average hearing threshold in air and after the application of either two layers of tape or a scrum cap

	Warble tone average		
	Air	Tape	Scrum cap
1	10	11.25	8.75
2	17.5	20	17.5
3	2.5	2.5	1.25
4	3.75	3.75	5
5	11.25	10	10
6	1.25	0	0
7	5	6.25	6.25
8	5	3.75	3.75
Mean	7.03	7.19	6.56
SDEV	5.47	6.40	5.58

patients were young men (mean age 24.75 years (range 22–34)). None had a history of hearing loss or previous ear surgery. Otoscopy was normal in seven, whilst one volunteer had a small volume of cerumen in the external auditory canal, but not obstructing the view of the tympanic membranes.

The warble tone average (the average hearing level in dB of the four frequencies measured) for all individuals can be seen in table 1. The mean warble tone average prior to the application of hearing protection was 7.03 dB; following the application of two layers of tape this was 7.19 dB and after the application of the scrum cap 6.56 dB. Data in each group was found to be normally distributed by visual assessment of the histogram and using the Shapiro–Wilk normality test. There was no statistical difference between either the air and tape groups ( $p = 0.763$ ) or the air and scrum cap groups ( $p = 0.285$ ) when analysed using the paired Student *t* test.

No thresholds at any frequency were changed by more than 10 dB following the application of either the tape or the scrum cap.

## DISCUSSION

The International Rugby Board (IRB) has stringent regulations for the design and manufacture of head protection equipment that is marketed for use in the game. Prior to IRB approval, all such products must undergo third party assessment to determine whether the products comply with these regulations. The regulations state that such equipment should have a 25–30 mm aperture over the ear, which may be covered by a mesh.<sup>5</sup> However, despite this provision, it is our belief that some players shun the use of head protection as they believe it may

affect their hearing and subsequent performance. Our study has shown that the application of a scrum cap or two layers of taping had neither a statistically significant effect on hearing thresholds nor a clinically significant effect on hearing (ie no difference greater than 10 dB at any frequency).

Our study also demonstrates no benefit in terms of hearing preservation after the application of either a scrum cap or two layers of tape as described; as such we could not recommend one method over the other. However, when compared with the strict criteria covering the design and manufacture of head protection, greater variation exists in the products used and quantity applied when “taping” ears. The tape product used in our study was chosen due to its elastic quality (enabling a snug fit) and porous nature. However, other commonly used products may have different effects on hearing and were not measured by this study.

A limitation of this study is its artificial nature; rugby matches do not occur in a soundproofed environment, and future studies could attempt to mimic the significant background noise that can pervade in rugby stadia. Furthermore, the ability of the human ear to localise sound is paramount in rugby as the supporting player is often behind the player in possession of the ball. Our study has not attempted to quantify the effect, if any, of head protection on the wearer’s ability to localise sound.

## CONCLUSION

We have demonstrated that two methods of ear protection commonly utilised by rugby players have no significant effect on their hearing. Therefore we concluded that theoretical concerns that “ear taping” and scrum caps affect hearing of rugby players are unfounded and should not discourage their use.

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**Competing interests:** None.

## REFERENCES

1. **Ohlsen L**, Skoog T, Sohn SA. The pathogenesis of cauliflower ear: an experimental study in rabbits. *Scand J Plast Reconstr Surg* 1975;**9**:34–9.
2. **Giffin CS**. Wrestlers ear: pathophysiology and treatment. *Ann Plast Surg* 1992;**28**:131–9.
3. **Takeuchi T**. Auditory information in playing tennis. *Percept Mot Skills* 1993;**76**:1323–8.
4. <http://www.irb.com/EN/Laws+and+Regulations/IRB+Approved+Equipment/Approved+Equipment.htm>
5. [http://www.irb.com/mm/document/lawsregs/0/060924gfirbregulation12\\_879.pdf#section3.3.2](http://www.irb.com/mm/document/lawsregs/0/060924gfirbregulation12_879.pdf#section3.3.2)

## Correction

There were several errors in the Warm up of the July issue (Pluim B. A doping sinner is not always a cheat. *Br J Sports Med* 2008;**42**:549–50). A corrected PDF is available on the website at <http://bjsm.bmj.com/cgi/content/full/42/7/549/DC1>.