



## REVIEW ARTICLE

# Dope Testing in Cricket

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**ABSTRACT**

Use of drugs is prohibited in sports and the same is applicable in cricket also. Research into the science and medicine underlying cricket performance and injury has progressed since the First World Congress of Science and Medicine in Cricket in 1999. Dope testing in cricket was introduced in 2002 and is being done since then in major cricket events. The International Cricket Council (ICC) became signatory of World Anti-Doping Agency (WADA) in July 2006. The ICC Anti-Doping Code compliant with the WADA Code ensures cricket plays its part in the global fight against drugs in sport. The present paper elaborates about the testing protocol being adhered to for the testing of samples in cricket for both in competition and out of competition of samples.

**Keywords:** Cricket, Dope testing, Prohibited substances in sports, World anti-doping agency.

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**INTRODUCTION**

The use of performance enhancing drugs is prohibited in sports. The testing of prohibited drugs and methods is governed by World Anti-Doping Agency (WADA) all through the globe. It comprises of stringent protocols and fool-proof sophisticated analytical methods for both urine and blood testing. The analytical methods involve various techniques *viz* gas and liquid chromatography, mass spectrometry, isotope ratio mass spectrometry, flow cytometry, immunoassay and electrophoresis, etc. The analysis performed by WADA-accredited laboratories on athlete's biological fluids (urine and blood) forms a key component to any effective anti-doping policy.<sup>1-4</sup>

Dope testing in cricket was introduced in 2002 and is being done since then in major cricket events. The International Cricket Council (ICC) became signatory of WADA in July 2006. The ICC anti-doping code compliant with the WADA code ensures cricket plays its part in the global fight against drugs in sport. Through the adoption

and implementation of the ICC anti-doping code, ICC continues in its efforts to: (a) Maintain the integrity of the sport of cricket, (b) Protect the health and rights of all participants in the sport of cricket and (c) Keep the sport of cricket free from doping.<sup>5</sup>

National Dope Testing Laboratory (NDTL) is engaged in the fight against doping since 1990. It makes continuous efforts in anti-doping through its stringent testing protocol, extensive research and education. The dope testing for cricket at NDTL started from 2003. The year 2010 was watershed year for NDTL, India in terms of achieving the international credibility by doing testing for two major games (Singapore Youth Games and Commonwealth Games), implementing new test methods and upgrading the status at International level by being among the very few WADA accredited labs engaged in doing the complete blood and urine profile.

The WADA prohibited list comprises of a total of 300 drugs and metabolites which are to be included in the testing scope of a doping laboratory. The general strategy to perform an anti-doping analysis starts with the screening for a wide range of compounds by following various screening procedures to analyze the great diversity of the banned doping agents/methods (Table 1).<sup>6</sup> The screening procedures being implemented by NDTL are the following:

The inclusion of new banned drugs and methods in the prohibited list of WADA challenges the doping control laboratories to keep their analytical methods updated. The extensive research in the field of anti-doping is necessary to establish reference ranges, marker metabolites and specific and fool-proof confirmation methods for the abused drugs/methods.<sup>6,7</sup>

Since 2004, and as mandated by, WADA has published an annual list of prohibited substances and methods (Table 2). The list, which forms one of the five International Standards, identifies the substances and methods prohibited in- and out-of-competition, and in particular sports.<sup>8,9</sup> The substances and methods on the list are classified by different categories (e.g. steroids, stimulants, gene doping).

National dope testing laboratory, India has signed a contract with International Doping Tests and Management (IDTM) in 2009 for testing of Indian Premier League (IPL) samples in accordance with the WADA code. An up-to-date testing of cricket samples at NDTL is depicted in Table 3, which includes both national and international

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**Table 1:** Screening protocols for urine and blood analysis

Screening procedure	Classes of substances	Sample preparation	Technique
<i>Urine analysis</i>			
Screening I	Volatile nitrogen containing compounds	Alkaline liquid-liquid extraction (LLE)	GC-NPD/MSD
Screening III	Plasma volume expanders	Acid hydrolysis—LLE-Silylation	GC-NPD
Screening IV	Anabolic steroids and other anabolic agents	Enzymatic Hydrolysis-LLE-Silylation	GC-MSD/GC-MS/MS
Screening VIII	Human chorionic gonadotropin (hCG) and luteinizing hormone (LH)	Direct Urine	ELISA
Screening VIII	Glucocorticosteroids, diuretics, beta-blockers and other heat labile compounds	Enzymatic Hydrolysis-LLE	LC-MS/MS
<i>Blood analysis</i>			
Screening X	Human growth hormone (hGH)	Kit method	Luminometry
Screening XII	Erythropoietin (EPO) and continuous erythropoietin receptors activators (CERA)	Kit method	Electrophoresis
Screening XIII	Blood transfusion	Coloration of RBCs with antibodies	Flow cytometry

**Table 2:** List of prohibited substances and methods

Category	Prohibited substances (in- and out-of-competition)
S1.	Anabolic agents
S2.	Peptide hormones, growth factors and related substances
S3.	Beta-2 agonists
S4.	Hormone and metabolic modulators
S5.	Diuretics and other masking agents
<i>Prohibited methods</i>	
M1.	Manipulation of blood and blood components
M2.	Chemical and physical manipulation
M3.	Gene doping
<i>Prohibited substances (in-competition)</i>	
S6.	Stimulants
S7.	Narcotics
S8.	Cannabinoids
S9.	Glucocorticosteroids
<i>Substances prohibited in particular sports</i>	
P1.	Alcohol
P2.	Beta-blockers

**Table 3:** Statistic for testing of samples in cricket

Sl. no.	Years	No. of samples	Competition-wise	
			C	OC
1	2008	19	—	—
2	2009	72	—	—
3	2010	93	—	—
4	2011	195	102	93
5	2012	293	189	104
6	2013	344	231	113
7	2014	544	360	184
8	2015	173	140	33
		1733	1022	527

C: Competition; OC: Out of competition

samples tested during competition and out of competition. However, till date, no blood sample is received for testing in cricket. In addition to testing other activities like awareness campaigns, athletes outreach programs and seminars are being held for national athletes.

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