Anti-Doping Awareness in Sports

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Lecture -15

ADRV Prevention Strategies

Good morning friends and welcome to today's lecture of the anti-doping course brought to you by NPTEL in association with Madras IIT. This is Week 3, Lecture 5. Today, we're going to discuss ADRV prevention strategies — that is, strategies to prevent anti-doping rule violations. I am Professor Dobson Dominic, Head of Sports Medicine and Sports Science at Saveetha Medical College, and President of the Indian Society of Sports and Exercise Medicine.

In the previous lectures, we have covered anti-doping rule violations by athletes and athlete support personnel. We also looked into the different articles under the WADA Code. We discussed how ADRVs can be avoided by athletes and support staff and explored the rights and responsibilities of both groups.

In the last session, we examined common anti-doping rule violation scenarios prevalent in our country and around the world. In today's lecture, we will explore the prevention strategies that can be adopted to reduce anti-doping rule violations. Specifically, we will look at WADA's global strategies to prevent ADRV, including education and learning platforms, known as Anti-Doping Education and Learning. We will also examine one of the more recent tools: the Athlete Biological Passport. Finally, we will see how the doping control process itself can be made more robust to prevent rule violations.

What are the strategies to reduce anti-doping rule violations? The most important one is educating athletes and support personnel about prohibited substances and the testing procedures through a process called Anti-Doping Education and Learning (ADEL), developed by WADA. WADA also enforces intensive testing, both in-competition and out-of-competition, to prevent ADRVs. The final strategy involves adopting the Athlete Biological Passport (ABP), which we will look into now.

ADEL stands for Anti-Doping Education and Learning Platform: WADA provides anti-doping education through this platform, which is designed for athletes as well as support personnel. WADA, along with national anti-doping organizations, conducts various sessions and awareness campaigns for athletes at tournaments, ranging from grassroots to state, national, and international levels. This education platform helps raise awareness among athletes about the risks and consequences of doping.

The second strategy adopted by WADA is the Athlete Biological Passport (ABP). What is the ABP? It is a tool used by WADA and national anti-doping organizations to monitor an athlete's biological markers over time. These markers include urine, blood, and sweat. The ABP tracks variations in these samples to detect potential doping. It establishes a baseline for an athlete's biological parameters and flags any significant deviations that may indicate the use of performance-enhancing substances or methods.

The concept of the Athlete Biological Passport was developed by WADA in the early 2000s. In 2009, WADA formally launched the ABP with a focus on the hematological module, which detects blood doping. In 2014, WADA expanded the ABP to include the steroidal module. Most recently, in 2023, the endocrine module was added. So, the Athlete Biological Passport now includes three modules; hematological, steroidal, and endocrine. These modules work together to monitor various biomarkers and identify patterns that may suggest doping. Each module targets a specific type of doping and uses longitudinal data analysis to uncover trends that may indicate the use of banned substances or methods.

The main objective of the ABP is to flag athletes for further testing. It uses longitudinal data to highlight suspicious patterns that may indicate doping. When unusual profiles are detected, they can trigger what is called "target testing," which means additional tests are focused on that specific athlete. This strategy helps optimize resources, as it is not feasible to test all athletes constantly. ABP allows for focused testing efforts on athletes who show abnormal biomarker profiles.

The second objective is to complement analytical testing. The ABP is not a standalone method; it works in conjunction with traditional analytical testing techniques. It detects physiological changes over time rather than identifying a specific banned substance, thereby strengthening the anti-doping framework. For example, the hematological module can trigger tests for agents that affect erythropoiesis, such as EPO or blood transfusions. The steroidal module can lead to advanced testing such as gas chromatography or isotope ratio mass spectrometry to detect synthetic steroids. The endocrine module can prompt growth hormone testing if there are abnormal IGF-1 or P3NP values.

The third objective of the ABP is enabling retrospective analysis and investigation. By monitoring biomarker data over time, ABP allows for long-term storage of samples. These samples can be retested years later when more advanced detection methods become available. This means that even if an athlete had used banned substances five years ago, they can still be caught retrospectively if new tests are able to detect previously undetectable substances. This retrospective testing capability is a key tool for upholding clean sport.

The ABP also supports the enforcement of anti-doping rule violations based on the use of substances rather than just their presence. That means even if a banned substance is not detected in a sample, but there is biomarker evidence of its use, action can still be taken.

The ABP is managed through a Passport Management Unit. These units are responsible for implementing and overseeing the ABP. They work in coordination with anti-doping organizations, laboratories, and WADA to ensure accurate data collection, analysis, and review. Their job is to ensure the integrity and reliability of the ABP program.

We now move to the prevention of ADRV during the doping control process. WADA's doping control process includes 11 stages to ensure fairness and transparency during testing. Athletes are monitored right from the time of notification to the final sample collection. This multi-step process helps prevent tampering and ensures the security of the sample.

One key step is the athlete's ability to choose the collection vessel themselves. Both urine and blood sample containers are made available, and the athlete selects the container to eliminate future claims of tampering or irregularities. A total quantity of about 90 ml of urine is collected under the direct observation of a Doping Control Officer (DCO). This sample is then split into two parts: the A sample for immediate testing, and the B sample, which is stored for possible retesting later.

During testing, the sample's specific gravity is measured to ensure it meets the required standards. Only the A sample is tested initially, while the B sample remains securely stored. In the documentation process, the athlete fills out a doping control form (DCF), verifying all aspects of the sample collection. The results are sent to a WADA-accredited laboratory. The final results are shared with the relevant national anti-doping organizations and with WADA.

All of these steps are essential and must be followed by all national anti-doping organizations to prevent anti-doping rule violations.

Now, for the take-home messages: Testing and regulations implemented by WADA and the International Olympic Committee aim to decrease doping incidents and eliminate the

use of banned substances and methods in sport. Enhanced testing and educational programs, especially through Anti-Doping Education and Learning, are key to preventing violations. Collective action is essential to promote clean sport. Athlete support personnel, including coaches and trainers, play a critical role and must be held accountable when violations occur.

These are the references for today's lecture. With this, we conclude the third week of the course. Assignments, especially multiple-choice questions based on this week's topics, will be shared. Students are encouraged to refer to the sources provided for further reading and understanding.

Thank you and Jai Hind.