The World Anti-Doping Code

ATHLETE BIOLOGICAL PASSPORT OPERATING GUIDELINES AND COMPILATION OF REQUIRED ELEMENTS

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Version 2.1
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1.0 Introduction and Scope

The idea of an ‘Athlete Biological Passport’ (AP) was first proposed by the World Anti-Doping Agency in 2002. The typical Doping Control approach based on the detection of Markers of a substance or its Metabolites remains an effective approach. However it has limitations when an Athlete may be using substances on an intermittent and low-dose basis which may therefore go undetected under even the most robust Out-of-Competition Doping Control program. Both the nature of many substances susceptible to abuse (particularly endogenous ones) and the increasing sophistication of Athlete intake protocols underscore the need for a more sophisticated methodology to be made available. Over recent years, doping regimes have become much more scientifically planned and have taken full advantage of the weaknesses in traditional protocols with all available pharmaceutical resources. Therefore the complementary strategy outlined in this document is aimed at ensuring an increasingly efficient fight against intentional doping at the most sophisticated level.

The passport concept is based on the knowledge of drug effects or side effects in medical practice. Regular and frequent monitoring of Doping Control data facilitates indirect detection of doping substances and methods on a longitudinal basis. From this perspective, the substance itself is not detected but rather its effects on the body become apparent. Typically, the effect of the drug remains perceptible and detectable longer in the body than the substance itself, which may otherwise be quickly excreted and therefore go undetected unless Testing is carried out at a very specific time.

In order to establish a systematic and robust longitudinal monitoring program, the list of relevant and significant variables for a specific class of substance (e.g. substances enhancing oxygen transfer, such as EPO) must be identified and then monitored on a regular basis for any given Athlete. The collection and monitoring of values corresponding to these identified variables will constitute an individual and longitudinal profile. Such profiles are the cornerstones of the Athlete Biological Passport with a subject becoming his/her own reference. This contrasts the traditional approach of the Athlete’s variables being measured against norms in the Athlete population at large.

The variables to be monitored will vary, according to the purpose of the detection. For instance, haematological variables in the blood will be taken into consideration to confirm blood manipulation or aerobic performance enhancement. Steroid Markers in urine on the other hand may be used to demonstrate the use of anabolic steroids. The purpose of this guideline is to support any Anti-Doping Organization wishing to set up the Athlete Biological Passport program described in this document based on a blood matrix only.
(the “Haematological module”). As further research and evidence is assessed regarding how this “intra-individual reference model” may be applied to a urine matrix, a similar “Endocrine module” will be developed as well as other possible modules. The appropriate steroid markers are still under development whereas the blood component can be utilised immediately. Other variables are likely to be added and monitored in the near future.

The Athlete Biological Passport concept does not replace or invalidate any existing blood ‘screening’ or medical protocols which an Anti-Doping Organization may currently operate. Rather, the Athlete Biological Passport is presented in order to equip Anti-Doping Organizations with a robust and viable framework in which to pursue anti-doping rule violations in accordance with Article 2.2 of the World Anti-Doping Code and support intelligent, targeted Testing. The Athlete Biological Passport is not intended to act as a mechanism for “no start” or “health check” protocols.

This document is divided into two sections. The first section is the text of the guideline which aims to explain how the Athlete Biological Passport works and how to establish it. Like any guideline, this element is to foster consistency and harmonization in the application of the Athlete Biological Passport within the anti-doping community, but is not mandatory. The second section is comprised of annexes which are a compilation of the mandatory protocols which must be followed by the Anti-Doping Organizations choosing to use the Athlete Biological Passport to ensure consistency in application, the sharing of information and the standardization of procedures. These annexes are included herein for ease of reference only and have been incorporated into the International Standard for Testing and International Standard for Laboratories as Technical Documents.

These mandatory protocols have been established to harmonize the results of monitored variables within the Athlete Biological Passport to ensure both legal fortitude and scientific certainty. Additionally, a global scheme of organization is proposed as a recommendation to ensure the most harmonized approach possible. Each Anti-Doping Organization remains free to adapt the global process to its own needs and goals, but any protocol attached as an annex must be rigorously applied to ensure the validity of the Athlete Biological Passport. Finally, although this guideline seeks to harmonize longitudinal profiling programs, it in no way undermines the validity or efficacy of existing Anti-Doping Organization programs. There are a number of useful and sound methodologies available to review blood data and in turn manage intelligent Doping Control programs, and the description offered in this document is one such model.
2.0 Terms and Definitions

2.1 Defined Terms from the 2009 Code

**ADAMS:** The Anti-Doping Administration and Management System is a Web-based database management tool for data entry, storage, sharing, and reporting designed to assist stakeholders and WADA in their anti-doping operations in conjunction with data protection legislation.

**Anti-Doping Organization:** A Signatory that is responsible for adopting rules for initiating, implementing or enforcing any part of the Doping Control process. This includes, for example, the International Olympic Committee, the International Paralympic Committee, other Major Event Organizations that conduct Testing at their Events, WADA, International Federations, and National Anti-Doping Organizations.

**Athlete:** Any Person who participates in sport at the international level (as defined by each International Federation), the national level (as defined by each National Anti-Doping Organization, including but not limited to those Persons in its Registered Testing Pool), and any other competitor in sport who is otherwise subject to the jurisdiction of any Signatory or other sports organization accepting the Code. All provisions of the Code, including, for example, Testing and therapeutic use exemptions, must be applied to international- and national-level competitors. Some National Anti-Doping Organizations may elect to test and apply anti-doping rules to recreational-level or masters competitors who are not current or potential national-caliber competitors. National Anti-Doping Organizations are not required, however, to apply all aspects of the Code to such Persons. Specific national rules may be established for Doping Control for non-international-level or non-national-level competitors without being in conflict with the Code. Thus, a country could elect to test recreational-level competitors but not require therapeutic use exemptions or whereabouts information. In the same manner, a Major Event Organization holding an Event only for masters-level competitors could elect to test the competitors but not require advance therapeutic use exemptions or whereabouts information. For purposes of Article 2.8 (Administration or Attempted Administration) and for purposes of anti-doping information and education, any Person who participates in sport under the authority of any Signatory, government, or other sports organization accepting the Code is an Athlete.

[Comment: This definition makes it clear that all international- and national-calibre athletes are subject to the anti-doping rules of the Code, with the precise definitions of international- and national-level sport to be set forth in the anti-doping rules of the International Federations and National Anti-Doping Organizations, respectively. At the national level, anti-doping rules adopted pursuant to the Code shall apply, at a minimum, to all Persons on national teams and all Persons qualified to compete in...]

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any national championship in any sport. That does not mean, however, that all such Athletes must be included in a National Anti-Doping Organization’s Registered Testing Pool. The definition also allows each National Anti-Doping Organization, if it chooses to do so, to expand its anti-doping program beyond national-caliber athletes to competitors at lower levels of competition. Competitors at all levels of competition should receive the benefit of anti-doping information and education.

**Code:** The World Anti-Doping Code.

**Doping Control:** All steps and processes from test distribution planning through to ultimate disposition of any appeal including all steps and processes in between such as provision of whereabouts information, Sample collection and handling, laboratory analysis, therapeutic use exemptions, results management and hearings.

**Event:** A series of individual Competitions conducted together under one ruling body (e.g., the Olympic Games of the Olympiad and the Winter Games, FINA World Championships, or Pan American Games).

**In-Competition:** Unless provided otherwise in the rules of an International Federation or other relevant Anti-Doping Organization, “In-Competition” means the period commencing twelve hours before a Competition in which the Athlete is scheduled to participate through the end of such Competition and the Sample collection process related to such Competition.

**International Standard:** A standard adopted by WADA in support of the Code. Compliance with an International Standard (as opposed to another alternative standard, practice or procedure) shall be sufficient to conclude that the procedures addressed by the International Standard were performed properly. International Standards shall include any Technical Documents issued pursuant to the International Standard.

**No Advance Notice:** A Doping Control which takes place with no advance warning to the Athlete and where the Athlete is continuously chaperoned from the moment of notification through Sample provision.

**Out-of-Competition:** Any Doping Control which is not In-Competition.

**Prohibited List:** The List identifying the Prohibited Substances and Prohibited Methods.

**Prohibited Method:** Any method so described on the Prohibited List.

**Prohibited Substance:** Any substance so described on the Prohibited List.
**Sample or Specimen:** Any biological material collected for the purposes of Doping Control.

[Comment: It has sometimes been claimed that the collection of blood Samples violates the tenets of certain religious or cultural groups. It has been determined that there is no basis for any such claim.]

**Target Testing:** Selection of Athletes for Testing where specific Athletes or groups of Athletes are selected on a non-random basis for Testing at a specified time.

**Testing:** The parts of the Doping Control process involving test distribution planning, Sample collection, Sample handling, and Sample transport to the Laboratory.

**WADA:** The World Anti-Doping Agency.

### 2.2 Defined Terms Specific to the International Standard for Testing (IST)

**Adaptive Model:** Model developed in which evidence or observations are used to update or to newly infer the probability that a hypothesis may be true or to discriminate between conflicting hypotheses. It was designed to identify unusual longitudinal results from Athletes.

**Athlete Biological Passport:** The method of gathering and evaluating data described in this document including the Technical Documents of the International Standards for Testing and Laboratories.

**Blood Collection Officer (BCO):** An official who is qualified to and has been authorized by the Anti-Doping Organization to collect a blood Sample from an Athlete.

**Chain of Custody:** The sequence of individuals or organizations who have the responsibility for a Sample from the provision of the Sample until the Sample has been received for analysis.

**Doping Control Officer (DCO):** An official who has been trained and authorized by the Anti-Doping Organization with delegated responsibility for the on-site management of a Sample Collection Session.

**Expert Panel:** The experts, with knowledge in the concerned field, chosen by the Anti-Doping Organization (independent experts, medical commission
members, etc.) who are responsible for providing an evaluation of the haematological or endocrine modules of the passport. Experts will have knowledge in the field of clinical haematology (diagnosis of blood pathological conditions), Laboratory medicine/haematology (Quality controls of data, analytical and biological variability, instrument calibration,...) and sports medicine or exercise physiology specialized in haematology (review of Athlete biological results In- or Out-of-Competition).

This panel may include a pool of permanently-appointed experts and any additional ad-hoc expert who may be required upon request of the Anti-Doping Organization. All members of the commission are required to sign a conflict of interest agreement. The passports are sent to a panel composed of three experts chosen from the pool by a secretariat of the Anti-Doping Organization.

**Doping Control Station**: The location where the Sample Collection Session will be conducted.

**International Federation (IF)**: An international non-governmental organization administering one or more sports at world level.

**Sample Collection Equipment**: Containers or apparatus used to directly collect or hold the Sample at any time during the Sample collection process. **Sample Collection Equipment** shall, as a minimum, consist of:

- For urine Sample collection:
  - Collection vessels for collecting the Sample as it leaves the Athlete’s body;
  - Sealable and tamper-evident bottles and lids for securing the Sample;
  - Partial Sample kit;

- For blood Sample collection:
  - Needles for collecting the Sample;
  - Blood tubes with sealable and tamper-evident devices for holding the Sample.

**Sample Collection Personnel**: A collective term for qualified officials authorized by the Anti-Doping Organization who may carry out or assist with duties during the Sample Collection Session.

**Sample Collection Session**: All of the sequential activities that directly involve the Athlete from notification until the Athlete leaves the Doping Control Station after having provided his/her Sample/s.

**Test Distribution Plan**: As defined in Clause 4.2.1.
2.3 Defined Terms Specific to the *International Standard for Laboratories*

**Confirmation Procedure**: An analytical test procedure whose purpose is to identify the presence or concentration of one or more specific *Prohibited Substance*, *Metabolite(s)* of a *Prohibited Substance*, or *Marker(s)* of the *Use of a Prohibited Substance or Method* in a *Sample*. [Comment: A *Confirmation Procedure* may also indicate a quantity of *Prohibited Substance* greater than a threshold value and quantify the amount of a *Prohibited Substance in a Sample*.

**Initial Testing Procedure (Screen Testing Procedure)**: An analytical test procedure whose purpose is to identify those *Samples* which may contain a *Prohibited Substance*, *Metabolite(s)* of a *Prohibited Substance*, or *Marker(s)* of the *Use of a Prohibited Substance or Prohibited Method* or the quantity of a *Prohibited Substance*, *Metabolite(s)* of a *Prohibited Substance*, or *Marker(s)* of the *Use of a Prohibited Substance or Prohibited Method* in excess of a defined threshold.

**International Standard for Laboratories (ISL)**: The *International Standard* applicable to *Laboratories* as set forth herein.

**Laboratory Internal Chain of Custody**: Documentation of the sequence of *Persons* in custody of the *Sample* and any *Aliquot* of the *Sample* taken for *Analytical Testing*.

[Comment: *Laboratory Internal Chain of Custody* is generally documented by a written record of the date, location, action taken, and the individual performing an action with a *Sample or Aliquot*.]

**Laboratory(ies)**: WADA-accredited *Laboratory(ies)* applying test methods and processes to provide evidentiary data for the detection of *Prohibited Substances, Methods* and *Markers* on the *Prohibited List*, and if applicable, quantification of a *Threshold Substance*, in urine and other biological *Samples* in the context of anti-doping activities.

**Testing Authority(ies)**: The International Olympic Committee, World Anti-Doping Agency, International Federation, National Sport Organization, National Anti-Doping Organization, National Olympic Committee, Major Event Organization, or other authority defined by the *Code* responsible for *Sample Testing* either *In-Competition* or *Out-of-Competition* and/or for management of the test result.
3.0 Scientific Bases of the Athlete Biological Passport

3.1 Objective

The objective of the Athlete Biological Passport is to monitor and identify possible doping in order to intelligently target an Athlete for traditional Doping Controls and where appropriate to establish an anti-doping rule violation. The following information is intended to support the medical, biological, scientific and statistical evidence which gives weight to such an approach.

3.2 General

The Athlete Biological Passport is a collection of carefully selected individual information which will assist Anti-Doping Organizations in differentiating between deviations of Markers that may be naturally occurring from those deviations likely caused by doping. The Athlete Biological Passport therefore becomes a matter for evaluation of the multiple pieces of scientific evidence.

3.3 Requirements for the Haematological Module

3.3.1 The haematological module should collect information on Markers of erythropoiesis. It has the sensitivity to identify among other doping methods, enhancement of oxygen transport, including recombinant erythropoietin abuse and any form of blood transfusion or manipulation. As part of a hemogram which should be established, the following Markers should be considered in an Athlete Biological Passport haematological module:

- HCT: Hematocrit
- HGB: Hemoglobin
- RBC: Red blood cells count
- RET%: The percentage of reticulocyte
- RET#: Reticulocytes count
- MCV: Mean corpuscular volume
- MCH: Mean corpuscular hemoglobin
- MCHC: Mean corpuscular hemoglobin concentration
- OFF-hr Score\(^1\): Index of stimulation
- Blood profile score

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4.0 Optimal Test Implementation

4.1 Objective

The objective of integrating the Athlete Biological Passport program into the larger framework of a robust anti-doping program may include the following:

a) Identification of target Athletes for further analytical Testing (recombinant EPO test, homologous blood transfusion test, etc.);

b) To pursue possible Anti-Doping Rule Violations in accordance with Code Article 2.2.

An Anti-Doping Organization is free to build its own structure to implement the Athlete Biological Passport program. However, the framework proposed in this guideline aims to build upon existing anti-doping infrastructure rather than requiring it to be supplanted in its entirety. Anti-Doping Organizations should therefore consider how to best integrate the Athlete Biological Passport program into existing programs taking into consideration the required resources and capacity to operate such a program without jeopardizing the effectiveness of traditional programs.

4.2 General

The sensitivity of the Athlete Biological Passport model to detect doping is improved as the number of tests considered together increases and where both In- and Out-of Competition tests are distributed throughout the year. Data points are most statistically independent when Samples have been collected at least five days apart.

Intra-individual variations can be reduced to an acceptable level after the collection of three initial values. As additional Samples are collected, the sensitivity of the Athlete Biological Passport improves.

4.3 Requirements

The Athlete Biological Passport Testing program shall be in compliance with the International Standard for Testing (IST) and applicable Technical Documents specific to the Athlete Biological Passport.

4.3.1 Definition of the targeted population

The following criteria may be considered to determine the targeted population upon whom to apply the Athlete Biological Passport program and
should be considered within the context of an Anti-Doping Organization’s overall Test Distribution Plan.

a) Number of Athletes who may warrant such a program;
b) Sports and/or disciplines at higher risk for blood-based doping;
c) Level of Competition;
d) Age.

4.3.2 Resources

In evaluating what resources may be required in order to adopt and implement the Athlete Biological Passport program, the following should be considered as essential:

a) Access to a network of Doping Control Officers (DCO) and Blood Collection Officers (BCO) operating in locations where target Athletes will be present
b) An effective whereabouts management system to facilitate Athlete location (i.e. ADAMS)
c) Database management capacity for storage and sharing of relevant anti-doping data (i.e. ADAMS)
d) Access to relevant experts and related management required;
e) Results management capacity.

5.0 Athlete Biological Passport Administration

5.1 Objective

Although the administrative organization of the Athlete Biological Passport program may be adapted to best suit the relevant Anti-Doping Organization, this guideline seeks to foster harmonization in the area of program administration in the interests of mutual recognition of Athlete Biological Passport data, standardized practice and to ensure overall efficiency in program application more generally.

The majority of administrative standardization should be achieved via the processing of all steps and data in ADAMS to ensure that all mandatory requirements are met and that Athlete data is shared and stored appropriately in accordance with the International Standard for the Protection of Privacy and Personal Information. Furthermore, ADAMS will facilitate prompt exchange of information between Anti-Doping Organizations, WADA-accredited Laboratories, Sample Collection Personnel and WADA. ADAMS functionality should support full implementation of the Athlete Biological Passport in this respect.
5.2 General Sequence

The following outlines the proposed relationship between the various mechanisms, requirements and organizations as they relate to the Athlete Biological Passport in sequence:

1. The Anti-Doping Organization identifies the Athlete of interest (referencing the ‘target group’) and identifies what may be required to update his or her passport. In order to perform additional tests, the Anti-Doping Organization collects the relevant and necessary information stored in the administrative management system (such as their past Testing history, existing passport data and available whereabouts information).

2. Sample collection request: the Anti-Doping Organization issues a Sample collection request (“mission order”) for a predefined period to a Sample collection agency or to Doping Control Personnel, preferably via ADAMS to restrict the dissemination of this information.

3. The Sample collection agency accesses the pertinent whereabouts information of the Athlete via ADAMS for only the period defined by the issuing organization.

4. The Doping Control Officer and/or Blood Collection Officer locate the Athlete and withdraw the biological Sample following the appropriate standard protocol (Annex A herein). This Sample is accompanied by passport specific documentation to be completed in addition to, or in lieu of a Doping Control form as required.

5. The Sample Collection Personnel are responsible for the transport of the biological Sample(s) to a WADA-accredited Laboratory following the appropriate protocol (Annex B herein).

6. Following the Sample Collection Session, the Sample collection agency or the Sample Collection Personnel should transcribe the Athlete Biological Passport Doping Control Form into ADAMS immediately to provide instant access to the data for the relevant Laboratory and Anti-Doping Organization as required.

7. The WADA accredited Laboratory analyzes the Sample(s) following the appropriate analytical protocol (Annex C herein) and reports the biological results into ADAMS.

8. All raw data coming from the WADA-accredited Laboratories (scattergrams, internal and external quality controls etc.) should be made available to the Athlete and relevant Anti-Doping Organization
upon request and in accordance with the International Standard for the Protection of Privacy and Personal Information.

9. The biological profiles are made available to the Athlete and the Anti-Doping Organization via ADAMS in order to be processed by the Adaptive Model and to follow the mandatory results management protocol identified in the Technical Document of the IST (and outlined in Annex D herein).

6.0 The Athlete Biological Passport and the Role of the Expert

6.1 Objective

It is essential that experts in the relevant field review all passport data and results in order to identify any possible pathological or confounding conditions which may have impacted an Athlete’s results. This expert review protects the Athlete’s right to thorough and qualified review prior to the possible assertion of an Anti-Doping Rule Violation in that it ensures that all possible factors, causes and circumstances are considered thoroughly.

6.2 General

The Adaptive Model is capable of triggering “alerts” and self-identifying abnormal profiles that warrant further attention and review. All such activities should be tracked, monitored and managed via ADAMS to ensure accurate, consistent and secure transfer of data to only the relevant and appropriate organizations and individuals.

7.0 Athlete Biological Passport Documentation

7.1 Objective

Given that additional information is required from Athletes beyond what is collected on traditional anti-doping documentation pursuant to the IST, supplemental or revised documentation may be required. The Athlete Biological Passport documentation therefore should ensure that the required information is collected on-site to accompany all Athlete Samples for Laboratory information and Anti-Doping Organization assessment as required.
7.2 General
Depending on whether Samples are also being collected for conventional analysis and the Athlete Biological Passport at the same time, some information for the Athlete Biological Passport may already be included in the standard collection form.

7.3 Requirements
The following information, at a minimum, should be included on the Athlete Biological Passport Doping Control Form:

a) Location of Testing;
b) Approximate ambient temperature;
c) Date and time of sampling;
d) Sport;
e) Event (if relevant);
f) Discipline;
g) License (if relevant);
h) Nationality;
i) Date of birth;
j) Full Athlete name;
k) “In” or “out” of competition;
l) Gender;
m) Declaration of medication/supplements taken;

The following information, at a minimum, should be included on the Passport Chain of Custody/lab advice form:

a) Type of Sample (blood, urine);

2 WADA shall make available to Anti-Doping Organizations wishing to implement the Athlete Biological Passport program, template documentation which meets the requirements of 7.3.
b) Required analyses;
c) Sample code(s)
d) Temperature of transport;
e) Chain of Custody information: name/company/function/date-time/signature etc;
f) Testing Authority;
g) Sample collection agency;
h) Results management authority.
PART THREE: ANNEXES

Adoption of the following Technical Documents (level two documents) is mandatory in order to comply with the requirements of the Athlete Biological Passport Program. All technical requirements identified herein are found in the relevant International Standards as Technical Documents but are consolidated herein and as follows as annexes for ease of reference. The requirements of this Annex are applicable to the Athlete Biological Passport only and are not applicable to any other approach to blood profiling or to blood collected for any other Doping Control purpose.

ANNEX A
Blood Collection Requirements for the Athlete Biological Passport

WADA Technical Document – TD2010BSCR

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<th>Version Number:</th>
<th>1.0</th>
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<td>WADA</td>
<td>Approved by:</td>
<td>WADA Executive Committee</td>
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Blood Sample Collection Requirements for the Athlete Biological Passport

1. Objective

This Protocol is intended to assist in the collection of blood Samples for the measurement of individual Athlete blood variables within the framework of the Athlete Biological Passport.

2. Scope

This Protocol covers the collection of blood Samples both In-Competition and Out-of-Competition.
3. Responsibility

Annex E of the *International Standard for Testing* (IST) is applicable to tests carried out in connection with the measurement of individual *Athlete* blood variables within the framework of the *Athlete Biological Passport*. This protocol describes certain additional specificities of blood collection related to the *Athlete Biological Passport* in particular.

4. The **Doping Control Station**

The *Doping Control Officer* (DCO) is responsible for the selection of an appropriate blood *Doping Control Station*. For the purpose of this Protocol the DCO and the *Blood Collection Officer* (BCO) can be the same *Person*.

The size of the room, the material, equipment, furniture, hygiene and temperature conditions for an optimal blood collection are determined by and are under the responsibility of the DCO/BCO.

5. The Timing of the **Sample Collection**

If collection occurs after training or competition, test planning shall consider the *Athlete*’s whereabouts information to ensure *Testing* does not occur within two hours of such activity. In case the *Athlete* has trained or competed less than two hours before the time the *Athlete* has been notified of his/her selection, the DCO or the BCO or a Chaperone shall monitor the *Athlete* until this two hour period has elapsed, after which the blood collection shall take place. The nature of the exertion (*Competition*, training, etc.) as well as the duration and general intensity shall also be recorded by the *Doping Control Officer*.

6. The **Commencement of the Collection Process and the 10 Minute Time-out**

The DCO/BCO welcomes the *Athlete* and his representative (if any):

a) The DCO introduces himself/herself as well as the BCO;

b) The DCO/BCO verifies the identity of the *Athlete* and his/her representative;

c) The DCO/BCO explains the Sample collection process and, with the BCO, answers any question which the *Athlete* may have concerning the process;
d) The DCO/BCO asks the Athlete to remain in a normal seated position with feet on the floor for at least 10 minutes prior to providing a Sample (“time-out”).

7. The **Athlete Biological Passport Doping Control Form**

The DCO/BCO shall use the Doping Control form related to the AP, if such a form is available. If a Doping Control form related to the Athlete Biological Passport is not available, the DCO/BCO shall use a regular Doping Control form but he/she shall collect and record the following additional information on a related form to be signed by the Athlete and the DCO/BCO:

   a) Did the Athlete have a training session or a Competition in the past two hours? If yes can the Athlete specify the type of training session or Competition?

   b) Did the Athlete train, compete or reside at an altitude greater than 1000 meters within the previous two weeks? If so, or if in doubt, the name and location of the place where the Athlete had been as well as the duration of this/her stay shall be recorded.

   c) Did the Athlete use any form of altitude simulation such as a hypoxic tent, mask, etc. during the previous two weeks and, if so, the type of device and the manner in which it was used (frequency, duration, intensity, etc.)?

   d) Did the Athlete donate blood or lose blood as a result of medical or emergency condition during the previous three months? If so, when and what was the cause of the blood loss as well as the estimated volume?

   e) Did the Athlete give or receive any blood transfusion(s) during the previous six months and, if so, when and what was the estimated volume?

8. The **Sample Collection Equipment**

The DCO/BCO instructs the Athlete to select the Sample Collection Equipment in accordance with Article E.4.6 of the IST. Vacutainers shall be labelled with a unique Sample code number by the DCO/BCO prior to the blood being drawn if they are not pre-labelled and the Athlete shall check that the code numbers match.
Comment: The WADA Blood Collection Guidelines have been revised to reflect these requirements and include practical information on the integration of Athlete Biological Passport Testing into ‘traditional’ Testing activities. A table has been included which identifies which particular equipment is appropriate when combining particular test types (The Athlete Biological Passport + hGH, the Athlete Biological Passport + HBT etc.)

9. The Sample Collection Procedure

a) The BCO visually examines the Athlete’s arms and selects to draw the Sample from a location on one arm. The Athlete’s arm shall be the preferred site of collection and good reason shall be recorded by the DCO to justify collection from elsewhere (e.g. amputee).

b) Manual palpations may be carried out to determine the pathway and the structure of the Athlete’s veins.

c) A tourniquet, if required, shall be put in place approximately 10 cm above the vein puncture location. The tourniquet shall not be tightened yet.

d) Once the Sample collection location is selected and the tourniquet applied (though not yet tightened), the BCO disinfects the skin in the area of the vein puncture location.

e) The BCO assembles the venipuncture equipment.

f) The BCO ensures that the 10 minute (or more) time-out period has elapsed. If a tourniquet is used, the BCO tightens the tourniquet while ensuring that the arterial circulation is not interrupted and the pulse is still perceptible. Once the BCO determines that the vein is sufficiently dilated (superficial venous circulation blocked), he/she proceeds to collect the blood Sample.

g) After verifying that the vein puncture location is dry (the disinfectant solution has evaporated), the BCO inserts the needle into the vein and observes if blood appears in the tube connecting the needle and the holder.

h) Once the BCO is satisfied that the needle is in the vein, he/she introduces the tube into the holder. As soon as blood begins entering
into the tube, the BCO releases the tourniquet as quickly as possible, and in accordance with Article E.4.9 and E.4.10 of the IST.

i) After the blood flow into the tube ceases, the BCO removes the tube from the holder and gently homogenizes the blood in the tube manually by inverting the tube gently at least three (3) times.

j) The BCO carefully removes the needle from the vein by neutralizing the needle and disposes of the used blood Sample Collection Equipment in containers specially designed for that purpose.

k) The BCO compresses the vein puncture location with a sterile compress, and asks the Athlete to continue gently compressing the blood Sample collection location for approximately five (5) minutes and to avoid bending the arm.

l) The BCO applies a dressing to the vein puncture location, if necessary.

m) The BCO or the DCO shall advise the Athlete not to undertake any strenuous exercise using the arm (or other site of collection) for at least 30 minutes in order to minimize any potential bruising. If collection occurs prior to Competition, the BCO or the DCO shall take this factor into account.

10. Post Venipuncture Procedure

a) The Athlete and the DCO/BCO sign the blood collection form(s).

b) The blood Sample is deposited and sealed in the Sample collection container in accordance with the IST.
ANNEX B
Blood Transport Requirements for the Athlete Biological Passport

WADA Technical Document – TD2010BSTR

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Blood Sample Transport Requirements for the Athlete Biological Passport

1. Objective

This Protocol is intended to assist the storage and transport of blood Samples collected for the measurement of individual Athlete blood variables within the framework of the Athlete Biological Passport.

2. Scope

This Protocol covers the storage and transport of blood Samples both In-Competition and Out-of-Competition.

3. Responsibility

The International Standard for Testing (IST) is applicable to the storage and transport of blood Samples carried out in connection with the measurement of individual Athlete blood variables within the framework of the AP. This Protocol describes certain specificities of blood storage and transport related to the Athlete Biological Passport.

4. Storage

Once a blood Sample has been collected in accordance with the Blood Sample Collection Requirements for the Athlete Biological Passport, it shall be stored in accordance with Article 8 of the IST and the present Protocol.

The storage procedure is the responsibility of the Doping Control Officer.

5. Type of Storage Devices

The DCO shall place the blood Sample in a storage device, which may be:
6. Capabilities of the Storage Device

The storage and transport device shall be capable of maintaining blood Samples at a cool temperature during storage. Whole blood Samples shall not be allowed to freeze. A temperature data logger shall be used to determine whether temperature conditions are met. In choosing the storage device the DCO shall take into account the time of storage, the number of Samples to be stored in the device and the prevailing environmental conditions (hot or cold temperatures).

6.1 Security of the storage device

The storage device shall be located in the blood Doping Control Station and shall be kept secured appropriately.

7. Transport Procedure

Blood Samples shall be transported in accordance with Article 9 of the IST, consistent with the practices of the WADA Blood Collection Guideline and in conjunction with this Protocol. The transport procedure is the responsibility of the DCO. Blood Samples shall be transported in a device that maintains the integrity of Samples over time due to changes in external temperature.

7.1 Security of the transport device

The transport device shall be transported by secure means using an Anti-Doping Organization authorized transport method.

7.2 Remarks concerning the storage and transport procedure

Blood Samples shall be analyzed within 36 hours of Sample collection.

Comment: The WADA Blood Collection Guidelines have been revised to reflect these protocols and include practical information on the integration of Athlete Biological Passport Testing into ‘traditional’ Testing activities. A table has been included which identifies which particular timelines for delivery are appropriate when combining particular test types (the Athlete Biological Passport + hGH, the Athlete Biological Passport + HBT etc) and which types of Samples may be suited for simultaneous transport.
ANNEX C
Blood Analytical Requirements for the Athlete Biological Passport

WADA Technical Document – TD2010BAR

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Blood Analytical Requirements for the Athlete Biological Passport

1. Introduction

This Technical Document has been established to harmonize the analysis of blood Samples collected, both In-Competition and Out-of-Competition, for the measurement of individual Athlete blood variables within the framework of the Athlete Biological Passport (AP).

The International Standard for Laboratories (ISL) is applicable to the analysis of blood Samples carried out in connection with the measurement of individual Athlete blood variables within the framework of the AP. This Technical Document describes certain specificities of blood analysis related to the AP.

All defined terms used in this Technical Document and not specifically defined herein bear the definitions accorded to them by the World Anti-Doping Code, the ISL and/or the International Standard for Testing (IST). Blood Samples shall be analyzed in a WADA accredited laboratory or as otherwise approved by WADA. If not reasonably possible for technical and/or geographical reasons, Blood Samples can be analyzed at a satellite facility of a WADA accredited laboratory or using mobile units operated under applicable ISO accreditation by WADA accredited laboratories.

2. Analytical procedure

In order to standardize analytical results in the Athlete Biological Passport framework, it is important to have blood Samples analyzed in an appropriate dedicated network of laboratories (e.g. WADA accredited laboratories or as otherwise approved by WADA) using analyzers with comparable technical
characteristics. It is necessary that the instrumentation is validated to provide comparable results prior to analysis of Doping Control Samples).

3. Instrument check

Before performing any blood analyses, all reagents shall be verified to ensure that they are within their expiration dates and that they comply with the reagent manufacturer’s recommendations. Then, the operational parameters of the instrument shall be properly controlled (background level, temperature of the incubation chambers, pressure, etc...) and fall within manufacturer’s specifications.

All internal Quality controls shall be analyzed twice following the specifications provided by the manufacturer. These internal Quality controls shall exclusively be furnished by the manufacturer of the instrument. These controls shall be handled in strict accordance with the specifications provided by the manufacturer (e.g. expiration dates, storage conditions, etc.). All results shall be in agreement with reference value ranges provided by the manufacturer.

On a regular basis (as determined by the head of the laboratory), one fresh blood Sample shall be homogenized for a minimum period of 15 minutes on an appropriate mixer (e.g. roller mixer) and then analyzed seven consecutive times. Coefficients of variation shall be below 1.5 % for hemoglobin and HCT and below 15 % for percentage reticulocyte count in order to confirm the appropriate precision of the instrument.

At least one internal Quality control from the manufacturer (either level 1, 2 or 3) shall be conducted after every 30 to 50 blood Sample analyses. Once a day and after all blood Sample analyses are completed, one internal Quality control (either level 1, 2 and 3) shall be analyzed once again to demonstrate continuous stability of the instrument and the quality of the analyses done.

4. External Quality Assessment Scheme

The Laboratories (or as otherwise approved by WADA) shall take part in and meet the requirements of the WADA External Quality Assessment Scheme (EQAS) for blood variables. The external quality controls shall be analyzed seven times consecutively and then the mean results of the following blood variables (full blood count) shall be returned:

| Red Blood Cell (Erythrocyte) Count | RBC |
Mean Corpuscular Volume MCV
Hematocrit HCT
Hemoglobin HGB
Mean Corpuscular Hemoglobin MCH
Mean Corpuscular Hemoglobin Concentration MCHC
White Blood Cell (Leukocyte) Count WBC
Platelet (Thrombocyte) Count PLT
Reticulocytes Percentage %RETI

Laboratories (or as otherwise approved by WADA) may also participate in ring tests between laboratories (hospitals, clinics, etc) using the same technology and the same procedure.

5. Analysis of Blood Samples

All blood Samples shall be homogenized for a minimum period of 15 minutes an appropriate mixer (e.g. roller mixer) prior to analysis. Each blood Sample shall be analyzed twice. Absolute differences between the results of the two analyses shall be equal or less than the following for the relevant analyses to be accepted:

- 0.1g/dL for HGB analysis;
- 0.15 absolute difference for % Reti analysis (if first measurement lower or equal to 1.00%);
- 0.25 absolute difference for % Reti analysis (if first measurement higher than 1.00%).

The data from the second injection is used to confirm the first injection data. Therefore, if the absolute differences between the results of the analyses are within the criteria above, then only the first injection data is reported. If absolute differences between the results of the two analyses are greater than those defined above for a specific Sample, the analysis shall be started again in accordance with this section 5. The reason for repetition shall be documented.

The requirements for an Initial Testing Procedure, A Sample Confirmation Procedure and B Sample Confirmation Procedure as defined in the ISL shall
not be applicable to blood Samples analyzed for the purposes of the Athlete Biological Passport.

6. Reporting

The results of the Laboratory (or as otherwise approved by WADA) shall be reported to the relevant Anti-Doping Organization and WADA via ADAMS.
ANNEX D
Results Management Requirements for the Athlete Biological Passport

WADA Technical Document – TD2010RMR

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Results Management Requirements for the Athlete Biological Passport

1. Administrative Management

A secretariat should be responsible for administering and managing the Athlete Biological Passport program within or on behalf of an Anti-Doping Organization. This mechanism should allow for all Athlete Biological Passports to be distributed to experts for review as soon as the analysis results are known and the Athlete’s profile has been updated by the Anti-Doping Organization. Sharing of this information is the responsibility of the Anti-Doping Organization and shall be stored and communicated via ADAMS. The Anti-Doping Organization is in charge of sending data anonymously, and experts shall initially review all profiles without reference to a specific Athlete by name. The members of the Anti-Doping Organization involved in this task will conduct all their activities in strict confidence. In particular all medical information and data provided by the Athlete will be treated as confidential medical information.

2. Initial Review

A profile in which the Adaptive Model has identified the Hb or Off-hr score abnormal with a 99.9% probability or more shall be reviewed by a panel of three experts. However, individual Anti-Doping Organizations may choose a lower probability score to identify Samples for further results management.

Other profiles not flagged by the Adaptive Model should be reviewed by one expert on a systematic basis. This expert alone can decide if the profile is initially normal or not. Normality means that both the individual values and the profile itself are within the expected ranges. The initial review in and of
itself may trigger follow-up *Testing*, targeting or the collection of additional passport information, however without further review, it should not lead to the initiation of an anti-doping rule violation proceeding.

### 3. Formal Review by Three Experts

In case of abnormal values identified by the [Adaptive Model](#) or profiles identified by one expert during the initial review, the file shall then be reviewed by a panel of three experts for advice and further recommendation. This panel shall include three experts with knowledge in the fields of clinical haematology (diagnosis of blood pathological conditions), [Laboratory medicine/haematology](#) (assessment of quality control data, analytical and biological variability, instrument calibration...) and [sports medicine or exercise physiology](#) specialized in haematology (review of *Athlete* biological results *In- or Out-of-Competition*).

If more information is required to review the file, the [Expert Panel](#) can request the [Anti-Doping Organization](#) to provide further medical information or data related to sport practice and training. To subsequently be considered an abnormal value or profile, a unanimous opinion among the three experts is necessary in order to proceed with possible results management.

Typically, a profile will be flagged by the [Adaptive Model](#) for a review by a panel of three experts if the profile deviates from the norm by 99.9%, however, an individual [Anti-Doping Organization](#) may choose to use a lower probability score, which will cause more profiles to be reviewed by their [Expert Panel](#).

The [Expert Panel](#) will conduct an initial review based on the *Athlete’s* blood profile data, and any additional information that the panel may choose to request from [Anti-Doping Organizations](#) or [Laboratories](#) relating to any *Sample* in the profile. The panel’s review shall also include a review of any confounding factor that might cause individual *Sample* results to be inappropriate to use in the *Athlete’s* profile without adjustment. Based on that review, the panel shall render one of the following opinions:

- a. In the panel’s unanimous opinion, absent a satisfactory explanation from the *Athlete*, it is highly likely that the *Athlete* has used a *Prohibited Substance* or *Prohibited Method*; or
- b. That the information received is suspicious for doping and additional investigation shall be pursued. The panel may advise what additional information it recommends; or
- c. That the information does not warrant any special additional *Testing* effort or investigation at this time.
Simultaneously with the Expert Panel’s review, the Anti-Doping Organization will conduct the review described in Article 7.1 of the Code.

4. Follow Up on Expert Panel Opinion

If the panel expresses the opinion set forth in 3 a) above, and the Anti-Doping Organization review under Article 7.1 of the Code does not provide an explanation for the result, the Anti-Doping Organization will:

a. Advise the Athlete that the Anti-Doping Organization is considering bringing an anti-doping rule violation against the Athlete;

b. Give the Athlete a copy of any document provided to the Expert Panel;

c. Invite the Athlete to provide his/her own explanation for the data provided.

Alternatively, if the panel expresses the opinion set forth in 3 b) above, then the Anti-Doping Organization shall conduct any investigation recommended by the Expert Panel and such other investigation as the Anti-Doping Organization may deem appropriate.

5. Review of Explanation from Athlete

Upon receipt of explanatory information from the Athlete (or if no explanatory information is provided), the Expert Panel shall further review the information provided by the Anti-Doping Organization, the information provided by the Athlete (if any), and any additional information that the panel considers necessary to render its opinion. This review may not be anonymous anymore. The panel shall then issue an opinion that includes one of the following statements:

a. Unanimous opinion of the panel that there is no known reasonable explanation for the blood profile information of this Athlete other than the use of a Prohibited Substance or Prohibited Method; or

b. Based on the available information, the panel is unable to unanimously reach the opinion set forth in 5 a) above and, in such case, the panel may or may not recommend further investigation.

6. Disciplinary Proceeding

If the panel expresses the opinion set forth in 5 a) above, then the Anti-Doping Organization shall proceed with the case as an asserted anti-doping rule violation in accordance with Article 8 of the Code.
ANNEX E
Additional Terms Required to be Incorporated into the
*International Standard for Testing (IST)*

**Adaptive Model:** Model developed in which evidence or observations are used to update or to newly infer the probability that a hypothesis may be true or to discriminate between conflicting hypotheses. It was designed to identify unusual longitudinal results from Athletes.

**Athlete Biological Passport:** The method of gathering and evaluating data described in this document including the Technical Documents of the *International Standards for Testing* and Laboratories.

**Expert Panel:** The experts, with knowledge in the concerned field, chosen by the *Anti-Doping Organization* (independent experts, medical commission members, etc.) who are responsible for providing an evaluation of the haematological or endocrine modules of the passport. Experts will have knowledge in the field of clinical haematology (diagnosis of blood pathological conditions), Laboratory medicine/haematology (quality controls of data, analytical and biological variability, instrument calibration,...) and sports medicine or exercise physiology specialized in haematology (review of Athlete biological results In- or Out-of-Competition).

This panel may include a pool of permanently-appointed experts and any additional, ad-hoc expert who may be required upon request of the *Anti-Doping Organization*. All members of the commission are required to sign a conflict of interest agreement. The passports are sent to a panel composed of three experts chosen from the pool by a secretariat of the *Anti-Doping Organization*. 