

Blood Collection Process (Example from USADA)

SAMPLE COLLECTION PROCESS – BLOOD

Blood samples collected by USADA may be analyzed for prohibited substances and/or methods and/or indirect biomarkers of doping that in some cases may not be detectable in urine, including, but not limited to those used in the Athlete Biological Passport.

The blood collection process closely resembles the urine collection process described previously, and it is not uncommon to provide both a urine and blood sample during a sample collection session. Here are a few differences and processes to expect:

- Some USADA DCOs will be qualified phlebotomists, but if they are not, a certified and/or licensed phlebotomist, called a blood collection officer (BCO), will perform the blood draw.
- To control for blood plasma volume changes, the athlete will be asked to remain seated for at least **10 minutes** prior to providing a blood sample. If the athlete has exercised within the last two hours, they will need to wait until **two hours** after completion of exercise before their blood sample can be collected.
- The BCO or DCO will select an area, typically the non-dominant arm, from which to draw the blood. The amount of blood drawn, which is up to approximately two tablespoons, is unlikely to affect performance.
- Athletes will be asked supplementary questions specific to blood collections that are important to the analysis of the sample. For example, they may be asked about their exposure to high altitudes or extreme environments, recent exercise, or blood loss.



Refer to the step-by-step process below to learn more



1 An outside portion of the upper arm needs to be accessible for the DBS draw. Warming the skin by vigorously rubbing the arm can encourage skin blood flow and aid collection. Unlike a standard venous blood draw, the athlete does not need to be seated for 10 minutes prior to collection, and there are no restrictions around prior exercise. The skin will be cleaned with an alcohol swab and left to air dry.



2 The Tasso M20 device will be applied to the clean skin and the athlete (or DCO if preferred) will push the red button to start the collection. There is a small prick, like a rubber band snapping against the skin, which means the Tasso M20 device is working properly.



3 The collection is complete when all four spots are red, which may take 3-5 minutes. The device is then removed, and a small bandage is applied to the arm.



4 The collection cartridge is removed from the collection device by placing the tongue of the collection device into the groove of the security kit and pushing down. The cartridge is placed into the compartment of the security kit with the white tab facing to the left. Once the cartridge has been vented by removing the tape, the black foam is removed, and the security kit can be closed. A tamper evident security seal is applied.



5 Finally, the security kit is placed inside a light-proof bag and is ready for shipping.

SAMPLE COLLECTION PROCESS – DRIED BLOOD SPOT (DBS)

While urine testing remains the most common testing method, blood samples are a critical component of anti-doping programs because they allow laboratories to detect prohibited substances and methods that are not otherwise detectable in urine samples. Over the years, anti-doping experts have been conducting research to make blood collection easier for both anti-doping organizations and athletes. Dried Blood testing, or DBS, is one of the latest and most innovative methods for collecting blood samples.

An FDA-regulated sterile collection device is placed on an athlete's skin and allows USADA to collect a series of very small capillary blood spots in a near painless way with the push of a button. In general, the process takes about 1-5 minutes, and the device collects about 25 times LESS volume than traditional blood collection methods. Athletes report lower levels of pain with the DBS device compared to collecting blood with a finger stick or standard venipuncture procedure. After collection, DBS samples can be transported without refrigeration and can be stored for longer periods of time, leading to greater opportunities for blood collection and reanalysis of samples. More athletes should expect to experience DBS collections, in combination with traditional urine and blood collections, in the near future as USADA continues to collaborate with the World Anti-Doping Agency and global partners to incorporate DBS collections worldwide.



- Definition and description of Athlete Biological Passport (ABP)
- Process of ABP (shown in the diagram below)

ATHLETE BIOLOGICAL PASSPORT (ABP)

The Athlete Biological Passport, or ABP, monitors selected biological markers in urine and blood samples over time that may indirectly reveal effects of doping on the body. The ABP allows anti-doping organizations to track individual athlete data and utilizes a mathematical model to monitor and analyze patterns and variations that may indicate the use of performance-enhancing drugs or methods. Passports that are flagged by the model as atypical are investigated by internal and external experts to establish whether the profile can be explained by normal physiology, a possible medical condition, or a prohibited method. An athlete's ABP data can also be used to complement traditional doping control approaches, such as conducting targeted anti-doping tests on athletes with atypical, or suspicious, characteristics, providing rationale for special analyses, or to establish an anti-doping rule violation.

