Biometric health screening modality comparison

Venipuncture vs. fingerstick vs. Dried Blood Spot method collection options

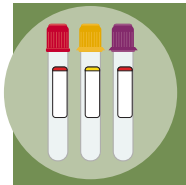
The following is a review of 3 methods of blood collection: venipuncture, fingerstick, and Dried Blood Spot method*. This information is provided to help employers select the best screening method for their organizations.

Venipuncture blood collection is performed at either an on-site event or at one of 2,200 Quest Diagnostics Patient Service Centers (PSCs). The provider collects blood from participants by inserting a needle into a vein in the region of the arm below the elbow. The blood sample is collected into a tube and sent to a Quest Diagnostics laboratory for analysis.

Fingerstick blood collection is performed at on-site events. The provider uses a lancet to stick a participant's finger and collect approximately 4 drops of blood for immediate analysis.

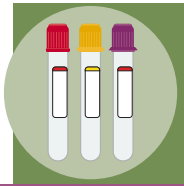
The Dried Blood Spot (DBS) method allows screening participants to self-administer their own biometric wellness screening. The participant receives all screening materials shipped directly to their home. The materials include a lancet to stick the finger and a DBS collection card, on which the blood specimen is collected. When the specimen is dried, it is mailed back to Quest Diagnostics for analysis. DBS collection can also be used to supplement fingerstick panels at on-site events.

Summary of Blood Collection Methods

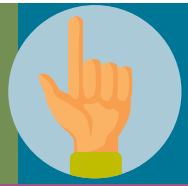
	 Venipuncture	 Fingerstick	 Dried Blood Spot method
Participant Access	• Available at on-site events and at 2,200 nationwide PSCs • Event minimums* accommodate smaller on-site events • Massachusetts and New Hampshire have regulatory restrictions on this test methodology for event-based testing, but the PSC options are available in those states	• Available only at on-site events • Event minimums* are higher than those required for venipuncture • There are some state-level regulatory restrictions on this test methodology • In the state of Massachusetts, triglycerides cannot be tested at on-site events	• Available to ship to participants' homes almost anywhere in the United States • Materials cannot be shipped to the state of New York, military bases located in the United States, or to any of the following locations: American Samoa, Micronesia, Guam, Marshall Islands, Northern Marianas, Palau, Puerto Rico, Virgin Islands, Armed Forces Europe, Armed Forces Middle East, Armed Forces Africa, Armed Forces Canada, Armed Forces Pacific
Time to perform blood collection	• Approximately 5 minutes • Ten minutes when the screening includes weight, height, blood pressure, and/or waist circumference measurements	• Approximately 1.5 minutes to collect the specimen and an additional 5-7 minutes to complete testing • Fifteen minutes when the screen includes weight, height, blood pressure, and/or waist circumference measurements • Additional time may be needed to explain the results to the participant	• Approximately 1.5 minutes to collect the specimen • Requires that the sample dry for 30 minutes before packaging and mailing back to the lab for processing

Summary of Blood Collection Methods

	 Venipuncture	 Fingerstick	 Dried Blood Spot method
Test Menu	• Supports a broader test menu than the standard Heart and Diabetes Panel • When the triglycerides result is >400 mg/dL, a reflex-direct LDL cholesterol is automatically performed • Additional tests can include hemoglobin A1c, cotinine, thyroid-stimulating hormone (TSH), prostate-specific antigen (PSA), kidney and liver panels, Complete Blood Count (CBC), and more	• Tests are limited to the standard Heart and Diabetes Panel • When the triglycerides result is >400 mg/dL, no LDL cholesterol result is calculated and there is no option for reflex-direct LDL cholesterol readings • In the state of Massachusetts, triglycerides cannot be tested when using fingerstick screenings	• Supports the standard Heart and Diabetes Panel and additional tests • Direct LDL cholesterol is automatically performed on all specimens, so there is no need for reflex testing • Additional tests can include hemoglobin A1c, cotinine, thyroid stimulating hormone (TSH), prostate-specific antigen (PSA), and gamma glutamyl transferase (GGT)
Perceptions	• Generally perceived as less painful than fingerstick when performed properly • Most people are accustomed to having their blood collected by venipuncture even if they “hate” needles • When asked, participants said they believe that tests completed in a lab are more accurate • If results are utilized for incentives, it is imperative the employee believes results are accurate to be willing to participate	• Considered to be more painful than venipuncture due to more nerve endings in the finger than in the arm, although some participants perceive a fingerstick as less painful • When asked, participants are more skeptical of the accuracy of point-of-care devices • Some participants are fearful of fingerstick screenings	• Considered to be more painful than venipuncture due to more nerve endings in the finger than in the arm, although some participants perceive a fingerstick as less painful • Some participants are fearful or wary of self-administering their own screenings • When asked, participants are more skeptical of the accuracy of Dried Blood Spot analysis



Venipuncture

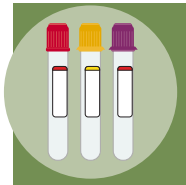


Fingerstick

Dried Blood Spot method

Summary of Blood Collection Methods

	Venipuncture	Fingerstick	Dried Blood Spot method
Accuracy and precision	• Testing is considered clinical as opposed to a informational because testing is performed with laboratory instrumentation, offering clinical levels of precision and accuracy across the spectrum of clinically relevant ranges, capturing both very high and very low results • Physicians recognize and accept laboratory-based results to help them diagnose and treat patients	• The CardioChek Plus accuracy strongly correlates with the reference venipuncture laboratory method, as shown by the r values for each of the parameters, which range between 0.8877 to 0.9838 • Fasting glucose, HDL, and total cholesterol are comparable to venipuncture results when using proper technique • The fingerstick method does not allow for the performance of a reflex-direct LDL like the venipuncture method does when the triglycerides result is >400 mg/dL	• Results collected from a Dried Blood Spot (DBS) specimen is an estimation of the result that an individual would have received from a blood specimen drawn from the arm. Most measures have been proven to have a high correlation with traditional venipuncture serum analysis. A routine review of DBS results vs. results drawn from the arm indicates that results for DBS glucose and LDL cholesterol trend lower than testing performed on blood drawn from the arm**.
Timeliness of test results	• Electronic results typically made available to participants in 2-5 days • Mailed results may take up to 2-3 weeks to arrive at participants' homes • Screening is convenient and can be completed on participant's schedules	• Results are available at, or immediately following, the screening • Able to provide a high-level review of the participants' results on-site following their screening appointment • Provides a Moment of Impact™ and corresponding teachable moment for on-site event participants • Critical glucose results may be triaged on location • Screening events are scheduled by the employer	• Results may not be viewable online up to 14 days following the receipt of a returned specimen • Mailed results may not arrive at participants' homes for 21 days following the receipt of a returned specimen • Screening is completed on participants' schedules



Venipuncture

Fingerstick

Dried Blood Spot method

Summary of Blood Collection Methods

	Venipuncture	Fingerstick	Dried Blood Spot method
Repeat testing	• On occasion, repeat testing is necessary because of an unusual result or provider error • Generally, sufficient blood is already collected and available for testing	• On occasion, repeat testing is necessary because of an unusual result or provider error • Generally, a second specimen can be collected on-site if an error occurs	• Clients can decide whether participants with an invalid specimen will be sent materials for a second collection
Risks associated with blood collection	• Some participants may experience bruising at the site of the draw; this can be greatly reduced by applying pressure on the draw site immediately following the draw	• Some participants may experience pain when the lancet is first introduced into the finger • Some may experience finger soreness after the fingerstick	• Some participants may experience pain when the lancet is first introduced into the finger • Some may experience finger soreness after the fingerstick
Cost	• All methods have similar costs for the Heart and Diabetes Panel • Additional tests can be added through the venipuncture and self-collection methods; costs vary by test		
Aggregate results	• Employers receive an aggregate report of results, and additional reports for specific groups can be provided if decided upon before the screening • Only available when there are 40 or more participants • Employers who have implemented screening programs more than once will receive cohort results		

For more information contact your Account Manager and Client Engagement Specialist.

*Dried Blood Spot (DBS) tests have been validated for general health screening purposes only. The result from a DBS specimen is an estimation of the result that an individual would have received from a blood specimen drawn from the arm. A routine review of DBS results vs. results drawn from the arm, indicates that results for DBS glucose and LDL cholesterol trend lower than testing performed on blood drawn from the arm. A DBS result can be affected by how the sample is collected, stored, and transported. All Quest DBS tests were developed and their analytical performance characteristics have been determined by Quest Diagnostics. They have not been cleared or approved by the U.S. Food and Drug Administration. This testing has been validated pursuant to the CLIA regulations. DBS testing should not be used for diagnosis or to make clinical decisions. Individuals who receive DBS fasting glucose results between 80 and 99 should review their results with a healthcare provider, as the results may suggest an increased risk of prediabetes. Individuals who receive DBS LDL cholesterol results between 105 and 129 should review their results with a healthcare provider, as the results may suggest that the individual may be at greater risk for experiencing a cardiovascular event.

**A DBS result can be affected by how the sample is collected, stored, and transported. DBS testing should not be used for diagnosis or to make clinical decisions. Individuals who receive DBS fasting glucose results between 80 and 99 should review their results with a healthcare provider, as the results may suggest an increased risk of prediabetes. Individuals who receive DBS LDL cholesterol results between 105 and 129 should review their results with a healthcare provider, as the results may suggest that the individual may be at greater risk for experiencing a cardiovascular event.

Quest Diagnostics.com.
Quest Diagnostics Incorporated and its subsidiaries (Quest) complies with applicable federal civil rights laws and does not discriminate on the basis of race, color, national origin, age, disability, or sex. ATTENTION: If you speak English, language assistance services, free of charge, are available to you. Call 1.844.698.1022. ATENCIÓN: Si habla español (Spanish), tiene a su disposición servicios gratuitos de asistencia lingüística. Llame al 1.844.698.1022.
GS0005