Biometric Wellness Screening Modality Comparison
Venipuncture vs. Fingerstick vs. Qcard™ Dried Blood Spot Method collection options

The following is a review of 3 methods of blood collection: venipuncture, fingerstick, and Qcard 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 onsite 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 onsite events. The provider uses a lancet to stick a participant's finger and collect approximately 4 drops of blood for immediate analysis.

The Qcard™ Dried Blood Spot 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 Qcard collection card, on which the blood specimen is collected. When the specimen is dried, it is mailed back to Quest Diagnostics for analysis. Qcard collection can also be used to supplement fingerstick panels at onsite events.
### Summary of Blood Collection Methods

<table>
<thead>
<tr>
<th>Method</th>
<th>Participant Access</th>
<th>Time to perform blood collection</th>
<th>Additional Notes</th>
</tr>
</thead>
</table>
| Venipuncture               | • Available at onsite events and at 2,200 nationwide PSCs  
• Event minimums* accommodate smaller onsite 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 | • Approximately 5 minutes  
• Ten minutes when the screening includes weight, height, blood pressure, and/or waist circumference measurements |  
| Fingerstick                | • Available only at onsite 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 onsite events | • 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 |  
| Qcard™ Dried Blood Spot Method | • Available to ship to participants' homes almost anywhere in the United States  
• Qcard 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 | • Approximately 1.5 minutes to collect the specimen  
• Qcard requires that the sample dry for 30 minutes before packaging and mailing back to the lab for processing |  

*Event minimums refer to the minimum number of participants required for each method.
### Summary of Blood Collection Methods

#### 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

#### 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

#### Venipuncture
- 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

#### Fingerstick
- 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

#### Qcard™ Dried Blood Spot Method
- 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)
- 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
### Summary of Blood Collection Methods

<table>
<thead>
<tr>
<th>Accuracy and precision</th>
<th>Venipuncture</th>
<th>Fingerstick</th>
<th>Qcard™ Dried Blood Spot Method</th>
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<tbody>
<tr>
<td>Testing is considered clinical as opposed to 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</td>
<td>• The Cholestech LDX accuracy strongly correlates with the reference venipuncture laboratory method, as shown by the $R^2$ values for each of the parameters, which range between 0.923 and 0.996</td>
<td>• Results collected by the fingerstick method using Qcard at-home testing materials have been proven accurate and have a high correlation with traditional venipuncture serum analysis [shown by the $R^2$ values for each parameter, which ranged between 0.945 and 1.0 (1.0 being the perfect score and matching the venipuncture method)]</td>
<td></td>
</tr>
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<td>Physicians recognize and accept laboratory-based results to help them diagnose and treat patients</td>
<td>• Fasting glucose, HDL, and total cholesterol are comparable to venipuncture results when using proper technique</td>
<td>• Electronic results typically made available to participants in 2-5 days</td>
<td></td>
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<td>• Electronic results typically made available to participants in 2-5 days</td>
<td>• The fingerstick method does not allow for the performance of a reflex-direct LDL like the venipuncture method does when the triglycerides result is &gt;400 mg/dL</td>
<td>• Mailed results may not be viewable online up to 14 days following the receipt of a returned specimen</td>
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<td>Mailed results may take up to 2-3 weeks to arrive at participants' homes</td>
<td>• Results are available at, or immediately following, the screening</td>
<td>• Mailed results may not arrive at participants' homes for 21 days following the receipt of a returned specimen</td>
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<td>Screening is convenient and can be completed on participant's schedules</td>
<td>• Able to provide a high-level review of the participants' results onsite following their screening appointment</td>
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### Timeliness of Test Results

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<td>Screening is convenient and can be completed on participant's schedules</td>
<td>Provides a Moment of Impact™ and corresponding teachable moment for onsite event participants</td>
<td>Screening is completed on participants' schedules</td>
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<td>Critical glucose results may be triaged on location</td>
<td>Screening events are scheduled by the employer</td>
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### Summary of Blood Collection Methods

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<th>Repeat testing</th>
<th>Risks associated with blood collection</th>
<th>Cost</th>
<th>Aggregate results</th>
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</table>
| • On occasion, repeat testing is necessary because of an unusual result or provider error  
• Generally, sufficient blood is already collected and available for testing | • 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 | • All methods have similar costs for the Heart and Diabetes Panel  
• Additional tests can be added through the venipuncture and Qcard methods; costs vary by test | • 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 |
| • On occasion, repeat testing is necessary because of an unusual result or provider error  
• Generally, a second specimen can be collected onsite if an error occurs | • Some participants may experience pain when the lancet is first introduced into the finger  
• Some may experience finger soreness after the fingerstick | | |
| • Clients can decide whether participants with an invalid specimen will be sent materials for a second collection | • Some participants may experience pain when the lancet is first introduced into the finger  
• Some may experience finger soreness after the fingerstick | | |

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