Finger-Stick Cholesterol & Glucose Screening
Clinical Procedure

Supplies
- Cholestech LDX® Machine
- Cholestech LDX® Slides
OR
- CardioChek® Plus Machine
- CardioChek® Plus Lipid Test Strips & eGlu Test Strips
- Lancets
- Capillary Tubes
- Plungers
- Sharps Containers
- Biohazard Bags
- Gauze
- Alcohol Swabs
- Bandages (Band-Aids)
- Gloves
- Place mats

Setup
The event worksheet will indicate whether Cholestech LDX® or CardioChek® Plus machines should be utilized for the event. Setup each station with one machine, and each of the other materials listed above, splitting the quantity of supplies evenly between each station. Up to two stations can be setup per table, as long as stations are setup on opposite ends. Equip each station with two chairs. It is recommended that the chairs face each other, without the table in between. We generally do not provide privacy screens for finger-stick cholesterol and glucose stations. Store equipment boxes and other materials under the table or in shipping boxes. If extra machines are available, distribute them evenly between the stations.

Definition & Purpose
Cholesterol – Soft, waxy, fat-like substance found throughout the body, including the bloodstream and cells. Excess cholesterol can form plaque between layers of artery walls, making it harder for blood to circulate. Reduced blood flow can lead to stroke or heart attack.

- Cholesterol Readings
  - Total Cholesterol (TC) – This value is not a type of cholesterol but instead a composite of different types. It is calculated by adding a participant’s HDL and LDL level, plus 20% of their Triglyceride level.
  - High-density Lipoprotein (HDL) Cholesterol – HDL cholesterol is often referred to as the “good” cholesterol. HDL cholesterol removes harmful cholesterol from where it doesn’t belong. High HDL levels reduce the risk for heart disease, but low levels increase the risk.
  - Low-density Lipoprotein (LDL) Cholesterol – LDL cholesterol is often called “bad” cholesterol because high levels lead to buildup in arteries, which narrows and may eventually block them. LDL cholesterol is the primary target of cholesterol-lowering therapy.
  - TC/HDL Ratio – This number illustrates how much of the participant’s cholesterol is the “good” HDL cholesterol. A low level of LDL along with a high level of HDL reduces the participant’s risk for heart disease, heart attack and stroke.

- Triglycerides – A type of fat (lipid) found in blood. High triglycerides can raise heart disease risk.
- Glucose – Main source of energy used by the body. Glucose levels that remain high over time can damage eyes, kidneys, nerves, heart and blood vessels.

Fasting vs. Non-Fasting
TotalWellness considers an individual to be fasting if they have had no caloric intake for at least 9 hours. Water intake is acceptable and encouraged. Participants are encouraged to fast for their screening, but fasting is not required. Total Cholesterol, HDL Cholesterol, and TC/HDL Ratio are all accurate without fasting. Glucose is also accurate without fasting, but non-fasting and fasting glucose acceptable ranges vary depending on the fasting status. TotalWellness provides both non-fasting and fasting glucose range charts, which should be used accordingly. LDL cholesterol and Triglyceride readings are accurate if the participant has fasted. If the participant has not fasted LDL cholesterol and Triglyceride readings may not be accurate. Write down all values for the participant, and during the health education discuss how fasting can affect LDL Cholesterol and Triglycerides.

© TotalWellness | 04.25.2018
**Finger-Stick Cholesterol & Glucose Screening**

**Clinical Procedure Continued**

### Measurement

Always wear two gloves, one on each hand, when collecting blood samples. Wear new gloves for each participant.

1. Put a capillary plunger into the end of a 40uL capillary tube with the red mark. Set aside.

2. Prepare the machine.
   
   a. **Cholestech LDX®**: Remove the cassette from its pouch. Hold the cassette by the short sides only. Do not touch the black bar or the magnetic stripe. Place the cassette on a flat surface.
   
   b. **CardioChek® Plus**: Insert the MEMo Chip that matches the lot number on both the eGLU and the Lipid Panel test strip vials. Remove one eGLU test strip from test strip vial and immediately replace cap. Insert the eGLU test strip into the designated eGLU test port. Remove one Lipid Panel test strip from test strip vial and immediately replace cap. Insert the Lipid Panel test strip into the designated reflectance test strip port.

3. Choose a spot on the side of one of the center fingers. The fingers should be warm to the touch, if they are not:
   
   a. Gently massage the finger from the base to the tip several times to bring the blood to the fingertips.
   
   b. Ask the participant to run their hands under warm water.

4. Clean the site with an alcohol swab. Dry thoroughly with a gauze pad before pricking the finger.

5. Firmly prick the side of the finger with a lancet. Dispose of lancet in provided biohazard container.

6. Squeeze the entire finger gently to obtain a large drop of blood.
   
   a. **Cholestech LDX®**: Wipe away this first drop of blood as it may contain tissue fluid.
   
   b. **CardioChek® Plus**: Gently touch the finger to the tip of the glucose test strip to apply 1.1 uL drop of blood. Do not place blood on top of the test strip. Do not press the glucose test strip into the finger. It is acceptable to move the machine to touch the finger as opposed to moving the finger to the machine. Blood will be drawn into the strip automatically by capillary action. After applying blood to the eGLU test strip, wipe the finger to remove any blood with a clean piece of gauze.

7. Squeeze the finger gently again while holding it downward until a second large drop of blood forms. Do not milk the finger. The puncture should provide a free-flowing drop of blood.

8. Hold the capillary tube horizontally or at a slightly descending angle by the end with the plunger. Touch it to the drop of blood without touching the skin. The test will start running automatically. Holding the capillary tube horizontally or at a slightly descending angle by the end with the plunger. Touch it to the drop of blood without touching the skin. The test will start running automatically.
   
   a. If you collect an air bubble and it does not go away after collecting the entire sample, dispose of the capillary tube and plunger in biohazard container and collect a new sample with a new capillary tube and plunger.

9. Fill the capillary tube within 10 seconds.

10. Wipe off any excess blood from the finger and have the patient apply pressure to the puncture until the bleeding stops. Apply a bandage (Band-Aid).

11. Apply the sample:
   
   a. **Cholestech LDX®**: Place the sample into the test strip blood application window. Be careful not to touch the tip of the capillary tube onto the test strip. The test will start running automatically.
   
   b. **CardioChek® Plus**: Place the sample into the test strip blood application window. Be careful not to touch the tip of the capillary tube onto the test strip. The test will start running automatically.

12. Dispose of lancet, capillary tube, and plunger in biohazard container.

13. Obtain the results and dispose of the testing supplies.
   
   a. **Cholestech LDX®**: When the test is complete, the analyzer will beep, and the screen will display results and the drawer will open. Press DATA to view additional results. Record results on participant’s paperwork.
      
      i. Remove cassette and dispose of in biohazard bag. Dispose of contaminated gloves in biohazard bag and uncontaminated gloves in regular trashcan. When machine is not in use, keep drawer open. To run another test hit RUN. To close door hit STOP.
   
   b. **CardioChek® Plus**: Results will appear in the machine window in approximately 2 minutes. Record results on participant’s paperwork.
      
      i. Remove test strips and dispose of in biohazard bag. Dispose of contaminated gloves in biohazard bag and uncontaminated gloves in regular trashcan.
### Interpreting Results

<table>
<thead>
<tr>
<th>Category</th>
<th>Desirable</th>
<th>Borderline High</th>
<th>High Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Cholesterol (TC)</strong></td>
<td>199 and below</td>
<td>200-239</td>
<td>240 and above</td>
</tr>
<tr>
<td><strong>HDL Cholesterol</strong></td>
<td>Lowers Your Risk</td>
<td>Normal</td>
<td>High Risk</td>
</tr>
<tr>
<td></td>
<td>60 and above</td>
<td>40-59</td>
<td>39 and below</td>
</tr>
<tr>
<td><strong>LDL Cholesterol</strong></td>
<td>Optimal</td>
<td>Near Optimal</td>
<td>Borderline High</td>
</tr>
<tr>
<td></td>
<td>99 and below</td>
<td>100-129</td>
<td>130-159</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>160-189</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>190 and above</td>
</tr>
<tr>
<td><strong>TC/HDL Ratio</strong></td>
<td>Optimal</td>
<td>Normal</td>
<td>High Risk</td>
</tr>
<tr>
<td></td>
<td>3.5 and below</td>
<td>3.6-4.9</td>
<td>5.0 and above</td>
</tr>
<tr>
<td><strong>Triglycerides</strong></td>
<td>Normal</td>
<td>Borderline High</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>149 and below</td>
<td>150-199</td>
<td>200 and above</td>
</tr>
</tbody>
</table>

#### High and Low Glucose Referral Protocol

Individuals with glucose readings of 300-399 mg/dL should be asked about their glucose history and should be instructed to follow up with their primary care provider. Individuals with extremely low (50 mg/dL or lower) or very high (400 mg/dL or higher) glucose readings should be questioned about their glucose history and monitored for symptoms. Call TotalWellness and speak with the Director of Nursing for assistance in accessing the situation. If the individual is not exhibiting symptoms and is aware of the condition recommend that they follow up with their primary care provider immediately. Call 911 if the participant is exhibiting extreme low/high glucose symptoms. Extremely low glucose symptoms include confusion, dizziness, headaches, irritability, racing pulse, sweating, and weakness. Extremely high glucose symptoms include confusion, lethargy, excessive thirst, frequent urination, weak pulse, and nausea. Complete an incident report if 911 is called.

### Participant Experience

Ensure the participants feel welcomed, encouraged, and educated by following the steps below.

**Welcome**
- Welcome the participant
- Introduce yourself
- Explain that you will be pricking their finger today, in order to provide cholesterol and glucose results

**Ask don’t Tell**
- Ask the participant which hand and finger they would like us to use, don’t tell them we have to use a specific finger.
- Kindly remind the participant to face forward, both feet on the floor, and relax.
- If the participant is having a hard time, ask them to envision themselves in a very calming place. Maybe at the beach or at a vacation spot they like.

**Watch for Signs**
- If a participant seems to question their results or if the results do seem off, re-test them
  - Make sure the participant knows that you are retesting because you just want to double check. NOT because the machines are inaccurate.
  - Participants should walk away feeling that they received valuable information. Make sure they don’t walk away thinking their values are incorrect.

**Guide to Ne**
- Guide the participant to the next station/service ensuring they know what is being offered next and where to go to participate in the service
Important Tips

- Raise your hand to gain the lead’s attention if you are having issues.
- If you do not get results after the first attempt, you should gather another sample and run the test again using a new cassette/test strips and a different machine.
  - Do not stick a participant more than twice trying to get results.
- Always put a bandage (Band-Aid) on the participant’s finger, don’t make the participant put it on themselves.

Cholestech LDX® Tips

- Store cassettes at room temperature.
- Use test cassette as soon as pouch is opened.
- Out of date or expired cassettes cannot be used. Check the expiration date on the cassette pouch prior to use.
- Never touch the magnetic strip on the cassette.
- Ensure the entire blood sample is deposited into the cassette well and spreads across the test strip.
- Always keeps cassettes horizontal, do not move cassettes vertically to distribute blood, the blood will wick across the strip automatically.
- Cassettes are to be used once. Never re-use a test cassette.
- Hand creams and soaps containing glycerol may cause falsely high triglyceride results.
- If you receive an unexpected result, test again.

CardioChek® Plus Tips

- Store test strip package in a cool, dry place at room temperature of 68-86°F (20-30°C). Keep away from heat and sunlight.
- Out of date or expired strips cannot be used. Check the expiration date on the vial prior to use.
- Do not remove or discard the desiccant packet in the vial.
- Always replace vial cap immediately after removing a test strip.
- Use test strip as soon as you have removed it from the vial.
- Keep the MEMo Chip either in the analyzer or stored with the original lot of test strips. Do not store the MEMo Chip in the test strip vial.
- Make sure the MEMo Chip and test strip lot numbers match. Never use a MEMo Chip from a different lot than the test strip.
- Add all of the blood to the test strip at once. If you do not get all of the blood on the test strip, do not add blood to the same test strip. Test again with a new, unused test strip and fresh blood sample.
- Test strips are to be read once. Never insert or read a used test strip.
- Ensure machine is not moved and table does not vibrate while sample is testing.
- The drugs dopamine and methyldopa may cause decreased lipid results.
- Extremely high doses of ascorbic acid (Vitamin C) may cause decreased lipid results.
- Glycerol, which can be found in some hand creams and lotions, may cause inaccurate results.
- If you get an unexpected result, test again.