How to Perform a Hemoglobin Test

The steps to the hemoglobin test are:

- **Step One**: Signing the Rights & Obligations Form
- **Step Two**: Washing Hands
- **Step Three**: Assembling Supplies
- **Step Four**: Turning on the HemoCue Machine
- **Step Five**: If Error Messages are Displayed
- **Step Six**: Choosing/Warming the Finger
- **Step Seven**: Cleansing the Finger
- **Step Eight**: Holding the Finger
- **Step Nine**: Puncturing the Finger
- **Step Ten**: Filling the Cuvette
- **Step Eleven**: Measuring Hemoglobin Levels
- **Step Twelve**: Bandaging the Finger
- **Step Thirteen**: Cleansing Work Area
- **Step Fourteen**: Disposing of Supplies

Note: The scope of this training only covers performing a finger stick on an adult. Your supervisor will guide you through the steps taken for infants and children.

Step One

Signing the Rights & Obligations Form

If this is required in your state:

Before taking a blood sample, make sure the client or Authorized Representative has signed the Rights & Obligations form giving you permission to perform bloodwork. Without permission, you cannot perform the hemoglobin test. This paperwork is often signed when the client checks in at the time of the appointment. Also, make sure to take this form or the Health Data card from the ID folder to the lab area with you, as you'll need it to write down the results of the blood test. Make sure to check with your supervisor regarding the documentation required at your agency.

Step Two
Washing Hands

Step two might seem like common sense and not worth mentioning, but it goes without saying that washing your hands with antimicrobial soap is necessary to prevent the transmission of germs, dirt or infection.

Since skin is a barrier to germs and infection, you must cleanse your hands to make sure your client's health isn't put at risk.

If a sink isn't available, as is often the case when taking blood samples at remote locations, hand cleaner, antimicrobial gel or hand wipes can be used. It's important to stress that you wash hands and change gloves between every blood test, even if you are performing tests on members of the same family. This is all part of the universal precautions set up by the Center for Disease Control and Prevention (CDC).

As far as gloving hands immediately after washing, this is optional. Some WIC staff like assembling the supplies with gloves on, while others put gloves on after assembling the supplies; however, when you're about to perform a blood test, gloves must be worn.

Step Three

Assembling Supplies

The following supplies are needed for the test:

- Disposable gloves
- Sterile lancets. (Not to be read by narrator: Note that smaller lancets are used for infant heel sticks, as they do not puncture as deeply. Lancets vary by agency; the one used for training at Arizona Department of Health Services ADHS is recommended by HemoCue. Your agency may vary.)
- Alcohol prep pads
- Antimicrobial soap which you've already used to wash your hands (or alcohol-based cleanser in situations where sink and soap are not available).
- Cuvettes in closed vial (only take out one cuvette at a time)
- Bandages (Some agencies do not bandage children under age 2, check with your supervisor for your policy.)
- Lint Free wipes® or gauze, not tissue or cotton balls, as these can leave pieces of cotton behind.
- Sharps container (or biohazard bag)
- HemoCue Machine
- 10% bleach solution or disinfectant spray

Step Four

Turning on the HemoCue Machine

Step four of the hemoglobin test is about turning on the HemoCue machine and making sure it's working properly.

The HemoCue machine can plug into the wall with an adapter, which is inserted in the back. It can also run on batteries if an electrical outlet isn't available. Make sure the batteries are removed if it's plugged into the wall. If not, the batteries will run down.

To make sure the HemoCue is functioning properly, open the cuvette tray, and press the 'On' button once. The analyzer will run a self-test upon being turn on, which takes about 10 seconds. When the three flashing bars appear on the screen, the machine is ready for use. Please refer to your supervisor for additional information on how to use the HemoCue.

Step Five

If Error Messages are Displayed

Step five of the hemoglobin test covers error messages that might be displayed on the HemoCue, and how to resolve them.

The analyzer needs to be cleaned on a regular basis, preferably weekly, but this time period may be determined by your local agency.

To clean the unit, turn the machine off. No part of the machine should be cleaned with alcohol or alcohol wipes, even though the HemoCue manual suggests using alcohol. Only mild soap and water are to be used on all parts of the machine.

The cuvette holder can be taken out by using a pen/pencil tip or fingernail to depress the groove, which will allow the holder to slide out and be cleaned. The cuvette holder can then be cleaned with soap and water to remove any dirt or blood. Do not insert it into the machine wet; allow it to air dry for 15 minutes.

The outside of the analyzer can be cleaned, if it is visibly dirty. Use mild soap and water and allow to air dry for 15 minutes, as well. If an error message appears such as ‘E01’ or ‘E02,’ you will need to clean the sensor inside the unit. To do this, start by turning off the machine.

You can then use a cotton swab moistened with water or a HemoCue cleaner. Squeeze out the excess water. Remove the cuvette tray. Insert the swab into the machine; angle it up and down to get at the sensor.

There may be dried blood that needs to be removed, which will make the swab reddish brown. Use additional cotton swabs to clean the unit until they come out clean.

Let the unit air dry for 15 minutes. Insert the tray back into the machine, and turn it on. The three bars will display. If not, it may be time to refer to your agency's troubleshooting procedures.

Step Six

Choosing/Warming the Finger

When your client comes into the lab area, ask her to sit down in a chair. Ask if you can feel the temperature of her hands.

If they are cold or blue, ask your client to put her hands under her arms, which is the preferred method of warming her hands. You can also ask your client to wash her hands vigorously with warm soap and water to warm them up.

Now it's time to choose the test site. Ask the client to extend her arm as if to shake hands. Make sure her hand is at or below the level of her heart. If her hand is above her heart gravity can work against pumping blood to this area, limiting the blood flow, resulting in a smaller drop of blood.

Typically, the middle finger is the best finger to use for a finger stick, as it has the best circulation. Make sure the finger is not callused at or near the nail bed and that the finger isn't swollen. If it is, inspect the middle finger on the opposite hand, and use it, if necessary.

If your client has a ring on the finger you've chosen, ask her to remove it, then ask her to rub her hands to restore circulation to this finger. Ask clients not to shake their hands to warm them up, as this will cause excess fluid to rush to the fingers and dilute the blood sample.

Step Seven

Cleansing the Finger

After the client's hands are warm, it's now time to cleanse the site with an alcohol wipe. After wiping the site several times, dry the site with gauze or a lint-free wipe. Never blow on the skin to dry the alcohol. Excess alcohol on the skin will dilute the sample and hemolyze the red blood cells, which means they will burst open, and give you a false reading.

If the client has washed her hands with soap and water in the lab, do not use an alcohol wipe. Alcohol cools the skin causing the blood vessels to constrict, thereby reducing the flow of blood.

Once the site is clean, the client must not touch anything, until after the test.

Step Eight

Holding the Finger

Once the site is cleaned, it can be 'primed' by placing your thumb and index finger on their finger at their last knuckle and, while keeping your finger in place, rock back and forth to get blood into the tip of the finger. In many cases, the finger will turn reddish purple. Milking the finger causes excess fluid to be drawn forward, diluting the blood and giving a false low reading. Once again, priming, which involves rocking back and forth over their last knuckle with your thumb and forefinger, is the key to getting blood into the tip of their finger.

Step Nine

Puncturing the Finger

Now that the finger is cleaned and primed, it's time to take the lancet and puncture the site. The site used should be the top of the finger, roughly halfway between the finger pad and the nail bed. Puncture the side of the finger pad in one continuous motion using a retractable lancet. The side of the finger pad is recommended and will hurt less than on top of the finger pad, since there are less nerve endings.

Rock your finger to get a drop of blood, and wipe it away with a lint-free wipe. Do this for at least 2 drops of blood before you collect your sample. The drop should be at least the size of a split pea. Doing this will give you a purer sample of blood.

Step Ten
Filling the Cuvette

After wiping away the first 2-3 split-pea sized blood drops, rock the finger to obtain your sample. The drop should sit atop the skin.

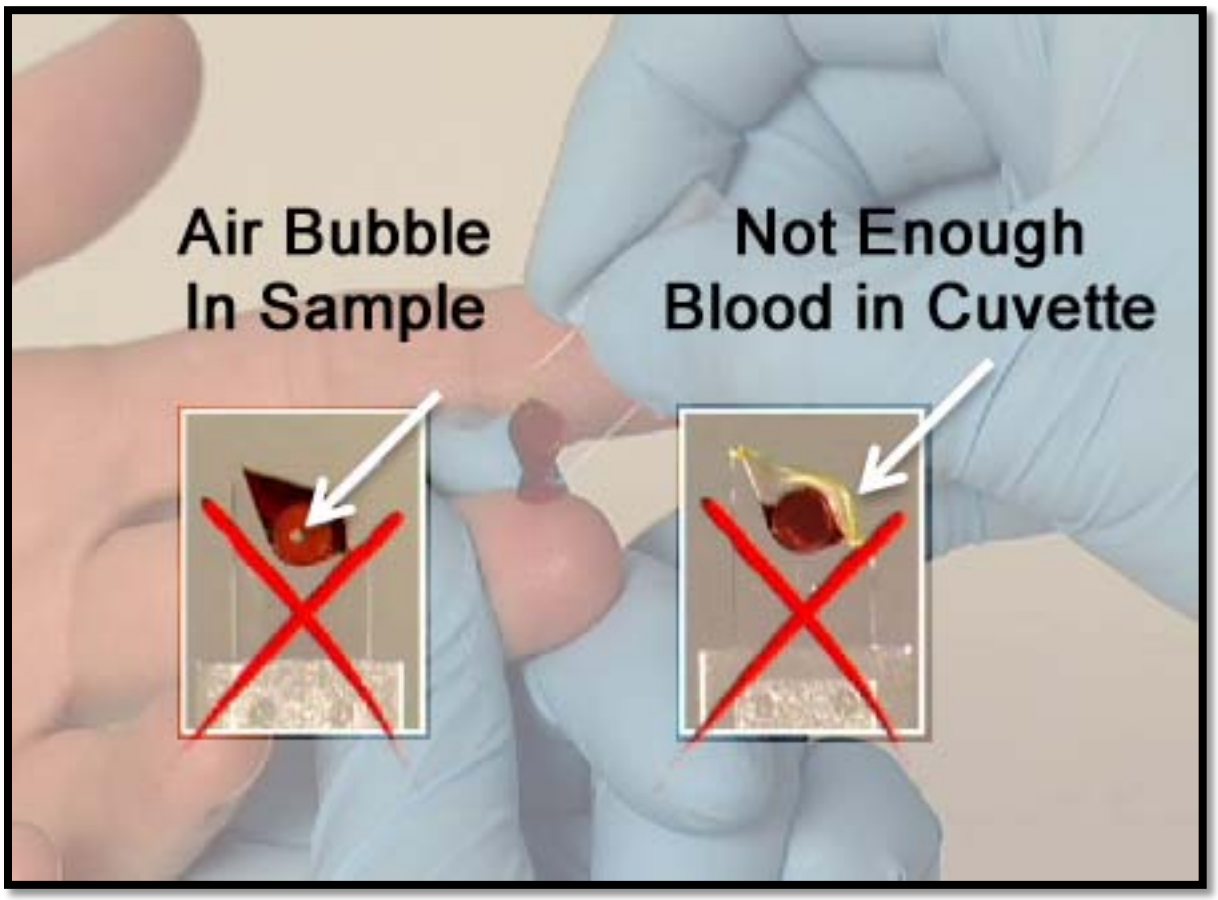
Place the tip of the cuvette into the blood sample so the tip of the cuvette touches the skin. The cuvette will fill itself automatically. Never "top off" the cuvette by dipping it back into the blood sample. This is why it's important to get a large enough drop of blood the first time.

The yellow substance inside the cuvette reacts with the blood. After filling up the cuvette, hand your client a lint-free wipe and ask them to apply light pressure to the puncture site. Never give your client an alcohol pad to stop the bleeding.

If the cuvette does not fill completely on the first try, or if air bubbles are visible, discard the cuvette. (See graph on next page.)

Wipe the puncture site and allow a new, larger bead of blood to form before collecting it into a new cuvette. If a bead of blood does not form, you'll need to start the test over using another finger.

Carefully wipe off the excess blood from the sides of the cuvette using a gauze pad or lint-free wipe. Do not touch the open-ended tip, as this can draw the blood outward. If blood is drawn out, you will need another sample.


Air Bubble
In Sample
Not Enough
Blood in Cuvette

Step Eleven

Measuring Hemoglobin Levels

Within 10 minutes of filling the cuvette, and wiping off the excess blood, place the cuvette in the HemoCue machine and gently close the tray. The cuvette will only fit into the machine one way. After closing the tray, the results should be displayed within 60 seconds.

Record the value on the Rights and Obligations form, Health Data card or other appropriate form

Step Twelve
Bandaging the Finger

In Step Three, laying out your supplies, the bandage was removed from the wrapper, but the tabs were kept on it. This was to keep the bandage sterile. You can take the bandage from the wrapper, but never remove the tabs and stick them to the countertop or the HemoCue machine.

Place dry gauze or lint-free tissue over a puncture site (DO NOT USE THE ALCOHOL SWAB) and apply gentle pressure until wound is clotted. Elevating the hand above the level of the heart will help to stop the blood flow.

Apply the bandage. As mentioned previously, never bandage a child that is under 2 years of age, as children this age like to put bandages in their mouth, which could cause choking.

If the parent/caregiver insists on a bandage, let them know why WIC doesn't use bandages on children this age, and give it to them to bandage.

Step Thirteen

Cleansing the Work Area

Step Thirteen is cleansing the work surface.

If any blood spills on work surfaces or skin, cleanse with a 10% bleach solution or disinfectant spray immediately.

The lab counter can be cleaned in between each client, but must be cleaned at least once daily.

If you have other family members in need of a test, you can leave the machine on, but make sure to repeat the procedure from the beginning.

Turn off machine at the end of the day, remove & clean the cuvette holder with mild soap & water. Let it air dry overnight.

Step Fourteen
Disposing of Supplies

After the blood test, make sure to throw away any paper wrappers, alcohol prep pads, gauze, lint-free tissues, gloves and any other supplies which are not saturated with blood, in the wastebasket.

An easy way to gather up contaminated paper supplies is to fold them up, then place this paper square in one of your gloved hands, then take the glove off so it turns inside out and wraps itself around the contaminated supplies. You can then place this in the second gloved hand, and turn it inside out, so it wraps around the contaminated supplies, too.

If any supplies are saturated with blood, make sure to place them in the red biohazard bag or Sharps container, if your agency doesn't use biohazard bags.

If your gloves are contaminated with blood, turn them inside out as you take them off, and place them in biohazard bag or Sharps container.

All lancets and used cuvettes go in the Sharps container, as well. They are never disposed of in the trash.

Remove and discard gloves after each client and after handling contaminated waste.

Clean hands with antimicrobial soap and water or alcohol-based cleanser or hand wipes, if water is not available. This is especially important if you are performing another test on a different member of the same family.

Performing a Second Test

So now that you obtained a value for the hemoglobin test, you need to compare this against the values for what is normal in your area.

The Centers for Disease Control and Prevention (CDC) has established hemoglobin cutoff values below which someone is considered at risk for anemia. These tables should be posted in your lab for you to evaluate your client's test result.

These tables are broken down by elevation, smoking status, and category (pregnant [by trimester], postpartum/breastfeeding, children, infants).

So what happens if your client's hemoglobin value appears to be low? If your client's value is outside of the 'Nutritionist' range, it's important to run a second test, on the other hand, and preferably, by another WIC staff member. When the test is complete, record the higher of the two test values. If this value is still outside the 'Nutritionist' range, assign the '201-Anemia' risk and refer them to the nutritionist; otherwise, it's simply at or below the 'Anemia' cutoff, assign the risk and counsel them on improving iron intake & absorption. If the hemoglobin value remains outside the 'Nutritionist' range on her next Certification, assign a '201-Anemia' risk and refer them directly to their healthcare provider.

An exception to this rule is when they have a very low hemoglobin level. Since this condition can be life-threatening refer your client immediately to her health care provider, even if this is the first time with a critically low level.

See your agency's policy to learn what critically low levels are.