Iron is of special interest to WIC because the populations served by WIC are those who are the most likely to be deficient in iron. The only way to determine whether a person has adequate iron stores is to do some type of blood test.

**Minimum Criteria for Hematological Equipment**

**Minimum Purchasing Criteria for Analyzers**
- Equipment must be Clinical Laboratory Improvement Amendments (CLIA) exempt/waived. The state agency (SA) holds the Certificate of Waiver for the Hemocue Analyzers. This waiver should be displayed where the testing is conducted.
- Equipment must be approved for pediatric and adult use.
- Machine must calibrate with an internal self-test instead of control cuvette.
- Machine must be durable and easy to clean.
- Results must be easy to read to ensure accuracy.
- Results must indicate read-out increments for hemoglobin testing in .1mg/dl or 1/10th of a percent.
- Power source is electrical or battery or both.

**Minimum Selection Criteria for Sharps**
- Sterile, single use disposable stylet
- Capable of controlling the depth of the puncture
- Retractable type recommended

**Minimum Selection Criteria for Disposable Containers**
- Puncture proof for sharp objects
- Hazardous materials bag for blood-related materials (e.g., bloody gauze, gloves, etc.)
- Labeled as “Biohazard”
- Placed in a secure place
- Monitor containers closely to avoid exceeding the “full line” of the containers
- Sharps containers disposed of according to OSHA guidelines.

**Minimum Criteria for Microcuvettes**
- Microcuvettes are stored at room temperature, away from any direct heat source.
- The vial should be kept tightly capped and cuvettes should be removed as needed for testing just prior to use. Unopened cuvettes have a shelf life of two (2) years from the date of manufacture.
- The expiration date is printed on each vial. Do not use expired microcuvettes. The expired microcuvettes should be returned to the state agency.
- Vials of cuvettes that have been opened are stable for three (3) months if the cap is kept on tightly between use.
When opening a new vial, label with the date opened.

### Anemia Screening Guidelines

Local agencies can perform two types of hematological tests (hematocrit or hemoglobin test) to determine a participant’s iron status. Iron deficiency is one of the most common nutritional deficiencies. A diagnosis of anemia can only be made by a physician or other health care provider (physician assistant or nurse practitioner). The anemia screening performed in the WIC clinic provides information on the hemoglobin status of the participant (low or normal), enables staff to assign the applicable nutrition risk factor, guides nutrition education and assists in making appropriate referrals.

For all categories, the data must have been collected while in the same status as that of the certification or MCA for the WIC Program as explained below.

<table>
<thead>
<tr>
<th>Timeframes to collect bloodwork data Per MMWR(^1)</th>
<th>Prenatal</th>
<th>Breastfeeding</th>
<th>Non-breastfeeding</th>
<th>Infants 0-11 Months</th>
<th>Children 12-23 Months</th>
<th>Children 2-5 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>At the earliest opportunity during the pregnancy, usually the first visit.</td>
<td>4-6 weeks postpartum</td>
<td>4-6 weeks postpartum.</td>
<td>Between 9 months of age and prior to their first birthday.</td>
<td>For children between 12 months of age and prior to their second birthday recommended at 15-18 months of age, ideally to be done 6 months after the infant bloodwork.</td>
<td>For children 24-60 months of age, blood work must be taken at least once every 12 months of age.</td>
<td></td>
</tr>
<tr>
<td>If they are certified later than 4 to 6 weeks postpartum, blood work shall be taken at the time of certification. For breastfeeding women 6-12 months postpartum, no additional blood test is required if a blood test was already obtained after delivery and documented.</td>
<td></td>
<td></td>
<td>If they are certified later than 4 to 6 weeks postpartum, blood work shall be taken at the time of certification.</td>
<td></td>
<td>Required for the 2-year old certification or MCA visit. For children 24-60 months of age, blood work must be taken at least once every 12 months. Rechecked at the next certification or MCA visit if Risk Factor 201 was assigned.</td>
<td></td>
</tr>
</tbody>
</table>

If an applicant or applicant parent or guardian refuses blood work, the participant shall be placed on a monthly cycle until the data has been collected. The reason for refused bloodwork must be documented in MOWINS.

\(^1\) CDC’s Morbidity and Mortality Weekly Report (MMWR); April 3, 1998; Vol. 47; No. RR-3
HemoCue® Hemoglobin System Overview

(Information provided by HemoCue, Inc.)

The HemoCue Hemoglobin System is used for the quantitative determination of hemoglobin in blood using a specially designed photometer, HemoCue Hemoglobin Photometer, and specially designed microcuvettes, HemoCue Hemoglobin microcuvettes.

The quantitative hemoglobin determination is indicated as a general fundamental test in acute as well as elective care. The test is used in assessing the status of a patient in such clinical situations as hemorrhage, hemolysis, dehydration and other shifts in plasma volume – and for verifying the results of transfusion or treatment of other deficiency states such as malnutrition.

Hemoglobin Training

Qualified local WIC provider staff must complete the required training before performing hemoglobin/hematocrit blood work on participants.

Who can provide the competency (hands-on) assessment training to local agency staff?

- HemoCue Clinical Education Specialist
- Registered Nurse (RN) who has been trained by the HemoCue Clinical Education Specialist. Note: for an RN, another RN must validate procedures.

HemoCue will provide the training (content and competency) at no cost to the local agency (LA). The LA staff may call 800-881-1611 to arrange training.

Online Hemocue training is available at http://hemocuelearningcenter.com/10-minute-modules/. The web training does not replace training provided by the Hemocue trainer. It can be used as a refresher, as a corrective action plan, viewed prior to training, or on an as needed basis.

Document the following in the individual’s training file:

- Who provided the training, and
- When the training was completed.

Procedure for Capillary (Finger) Testing

1. Women and children must have a finger stick. Note: Toe sticks are not allowed. Heels can be used until the infant is walking. Once the infant begins to walk, a finger stick is required.

   a. For best results, use the middle or ring finger for sampling.
   b. Remove a cuvette from the vial and recap the vial immediately.
   c. Do a finger or heel puncture (see note above). The participant’s fingers should be straight but not tense to avoid restricted blood flow.

2. When lead and hemoglobin samples are taken (from the same finger stick), see the “Procedure for Lead and Hemoglobin Using Same Finger Stick” (located on page 6).
3. Clean the puncture site with alcohol. Wipe off the alcohol with a clean, dry, lint-free wipe or allow it to air dry completely.

4. Using your thumb, lightly press the finger from the top of the distal knuckle to the tip. This stimulates the blood flow towards the sampling point.

5. Position the lancet device (toward the thumb side) so that the puncture will be made across the whorls (lines) of the fingerprint. Press the lancet firmly against the finger prior to activating the lancet to aid in obtaining a good sample.

6. While maintaining gentle pressure on the tip of the finger, perform the stick off-center on the fingertip. Discard the lancet in an approved container.

7. Using dry gauze or other lint-free tissues, wipe away the first two or three large drops of blood, applying light pressure as needed again until another drop of blood appears. This stimulates blood flow and lessens the likelihood of a dilutional effect by interstitial fluid. Avoid “milking of the finger.”

8. Make sure the drop of blood is big enough to fill the cuvette completely. Hold the cuvette at the “wing” end and introduce the cuvette tip into the middle of the drop of blood. Fill the cuvette in one continuous process. Do not refill a partially filled cuvette.

9. Wipe off any excess blood from the outside of the cuvette using a clean, lint-free tissue, taking care not to touch the opened end of the cuvette.

10. Visually inspect the cuvette for air bubbles in the optical eye. If bubbles are present in the optical eye, discard the cuvette.

11. The filled cuvette should be analyzed immediately or at the latest within 10 minutes after it has been filled. Filled cuvettes are to be kept in the horizontal position. Place the filled cuvette into the cuvette holder and gently slide the holder into the measuring position. The result will be displayed within 60 seconds. Pull the cuvette holder out to the loading position. Remove the cuvette and discard it in an appropriate biohazard container.

12. Clean blood spills on the counter or work surface with a 10% bleach solution or a disinfectant spray.

13. Never recap, purposely bend or break lancets unless the equipment manufacturer requires it.

14. **Change gloves between all participants, including family members**, after completing the procedures.

15. Turn the power switch to “off” at the conclusion of all testing for the day.

**What to do when the hemoglobin shows a low value?**

Once the low hemoglobin has been reported to the participant’s health care provider who will monitor the situation, there is no need for repeat blood work until the participant’s next certification and/or MCA.
Analyzer Maintenance & Repair

**Maintenance**

1. All equipment coming in contact with blood should be handled as potentially infectious, according to universal precautions and good laboratory practice. Gloves shall be worn when cleaning the optical parts of the analyzers.

2. The HemoCue analyzer has an internal quality control, the “self-test.” Every time the analyzer is turned on, it will automatically verify the performance of the optronic unit of the analyzer. This test is performed every second hour if the analyzer remains switched on. Upon passing the “self-test,” the display will show the HemoCue symbol and three flashing dashes, indicating that the analyzer is ready to perform a measurement. An error code will be displayed if the “self-test” fails.

3. At the end of each day, the cuvette holder and exterior of the analyzer shall be cleaned.
   a. Check that the analyzer is turned off. The display should be blank.
   b. Pull the cuvette holder out to its loading position. Carefully press the small catch positioned in the upper right corner of the cuvette holder.
   c. While pressing the catch, carefully rotate the cuvette holder toward the left as far as possible. Carefully pull the holder away from the analyzer.
   d. Clean with approved disinfectant:
      i. Isopropanol ≤ 45 volume %, i.e. CaviWipes, DisCide (not effective against all viral and bacterial bloodborne pathogens).
      ii. Ethanol, 70% (effective against Ebola virus, not effective against all viral and bacterial bloodborne pathogens).
      iii. 70 – 95% ethanol or isopropyl alcohol.

4. When an error message has occurred on the display screen, clean the optical part of the analyzers with 70% - 95% ethanol or isopropyl alcohol. A dirty optronic unit may cause the analyzer to display an error code.
   a. Hemocue does not recommend using alcohol prep pads to clean the optics because there are additional agents in the prep pad that will leave a residue on the optics.
   b. To clean the optronic unit use a cotton tip swab moistened with 70 – 95% ethanol or isopropyl alcohol or Hemocue cleaner. Insert the swab into the opening of the cuvette holder. Move from side to side 5 – 10 times. If the swab is stained, repeat with a new swab. No further cleaning is required if the swab remains clean.
   c. Wait 15 minutes before replacing the cuvette holder and using the analyzer.

**Repair Service**

If your agency has any questions regarding the HemoCue equipment, please contact your district nutritionist and not the company.

**HemoCue Supplies Arrive in the Clinic**

When you receive the order, please verify the number of microcuvettes received with the number listed on the packing slip. If the number of microcuvettes/analyzers in the package is the same as the packing slip, sign and date the packing slip. Please fax the packing slip to
Health and Nutrition Assessment Handbook
Biochemical/Bloodwork

the SA at 573-526-1470 within one (1) week of receiving the shipment. Confirmation on the packing slip is required in order for the SA to pay for the microcuvettes/analyzers and to send WIC inventory tags for the analyzers.

If the number of microcuvettes/analyzers received is different from the packing slip, please call 1-800-392-8209. If you are unable to locate your packing slip, please send an email to WICOOperations@health.mo.gov stating how many boxes or analyzers you received and the date you received the shipment.

Expired microcuvettes should be mailed to the SA at PO Box 570, Jefferson City, MO 65102. Contact the SA for the procedure to dispose of expired microcuvettes/analyzers. If you find that you are in need of microcuvettes, please email the SA at WICOOperations@health.mo.gov or call 1-800-392-8209.

WIC Requirement for Lead Assessment

1. For children age 1 – 5 years, ask if lead screening has been done within the last year.
   a. Lead Screening is defined as: asking if the child has had a blood lead test or a screening using the Missouri HCY Lead Risk Assessment Guide to determine if a blood lead test is needed.
   b. Lead Testing is defined as: a capillary or venous blood lead test.

2. If a lead test value is provided to WIC:
   a. Document the lead value in MOWINS.
   b. Values of 5 or higher shall be entered into MOWINS. Risk factor 211 will be auto assigned by the system.
   c. Values less than 5 may be entered.
   d. Drop the decimal when entering lead values into MOWINS.
   e. If the value from LeadCare is “<3.3,” it is not necessary to enter into MOWINS.

3. Local agency may ask a prenatal if she has had a blood lead screening test.

4. Document lead referrals in MOWINS as “Lead Screening” and/or “Local Health Department” and/or “Medical/Dental Health Services.”

Procedure for Lead and Hemoglobin Using Same Finger Stick

When a non-WIC entity, i.e., health department or center, fulfills their requirement for a blood test at the same time (same finger) as hemoglobin testing at the WIC appointment:

1. Take hemoglobin first unless otherwise instructed by the product used to collect the lead sample.
   If the lead is collected first, the integrity of the hemoglobin sample must be preserved, including:
   a. Maintain gentle pressure on the tip of the finger without “milking the finger”.
   b. Fill cuvette with the 3rd or 4th large drop of blood.
   c. Fill cuvette properly, point down.
d. Fill cuvette completely. Do not refill a partially filled cuvette.

2. Participants shall be advised that lead testing is not required in order to receive WIC benefits.

3. WIC funds are not allowed to be used to conduct blood lead screening tests.