Trainer Edition

Arizona WIC Training

Hematology Guidebook

WIC ARIZONA

ARIZONA DEPARTMENT OF HEALTH SERVICES

Contents

What Will You Learn?

In this guidebook, you will learn how to perform hemoglobin screening safely and accurately. You will also learn how to explain the risks of anemia to participants, and offer ways to improve iron status through dietary choices.

After completing the Hematology LMS Course and guidebook, you will be able to:

- Identify which participants require blood testing
- Describe important functions of hemoglobin
- Explain how anemia is associated with low hemoglobin
- Identify the appropriate lancet to use with different participants
- Identify proper safety precautions to take in order to obtain hemoglobin blood values
- Identify the steps to take to determine a participant's hemoglobin value

Items Needed for This Course

- Pen or pencil
- Local Agency Referral List
- Access to the Arizona WIC Laboratory Procedure Manual, either a hard copy or on the website https://azdhs.gov/documents/prevention/azwic/manuals/azwic-lab-manual.pdf. [Navigate to azwic.gov: WIC Home →Local Agencies →WIC Manuals →Arizona WIC Laboratory Procedure Manual]. To save paper, you do not need to make copies of or print the policies or procedures.

Recommended Time

- Approximate time it takes to complete the Hematology LMS course: 1-2 hours
- Approximate time it takes to complete the face-to-face activities and discussion: 2-3 hours

Things to Remember

- This guidebook is yours to keep.
- You are encouraged to take notes, highlight, and write in the guidebook.
- As your trainer chooses, you may work in a group or as an individual.
- You are encouraged to ask your trainer(s) for help, ask questions about the information in the course, or ask any questions about additional topics related to hematology training.

TRAINER NOTE: As the trainer, you are assessing trainees for their understanding of hematology competencies for each module. The guidebook training activities are intended to help you assess both trainees' ability to apply basic knowledge and their critical thinking skills.Participation by the trainee in the face-to-face activities and discussions is required in order for you to thoroughly assess their skills and level of competence.

Hematology Course Instructions

- ☐ Log onto https://az.train.org/DesktopShell.aspx
- ☐ Open and complete all modules of the Hematology LMS course and the corresponding Hematology Activities in this guidebook.
- ☐ At your trainer's direction, complete the Hematology LMS course and guidebook, either individually, with other trainees, or with your trainer.
- ☐ Complete the Hematology Post-Test
- ☐ Meet with your trainer at their discretion to discuss each module of the Hematology LMS course and the associated activities in this guidebook, either after each module or after all modules have been completed.

TRAINER NOTE:

Trainer Steps:

- ☐ **At your discretion, trainees may work in groups or as individuals.**
- ☐ **At your discretion, you may review answers with trainees periodically as they complete activities of the Hematology Guidebook, or after they have fully completed it. Please answer all questions the trainees may have and clarify any incorrect answers.**
- ☐ **"Possible responses" provided throughout the guidebook are suggested responses and are often not the only answers.**
- ☐ **If training more than one person at a time, be prepared for trainees to finish the coursework at different times. In order to have trainees review the face-to-face portions together, prepare a list of things that trainees who finish first can do during downtime (e.g., ask you questions for more clarification, check email, clinic observation, etc.).**

Module 1: Hematology Introduction

TRAINER NOTE: It is recommended for you to review the competencies below with trainees.

MODULE 1 COMPETENCIES:

1. Trainees will be able to identify which participants require blood testing and when their next blood test will be required.
2. Trainees will be able to describe what hemoglobin is and its most important functions in the body.
3. Trainees will be able to explain how anemia is associated with low hemoglobin.
4. Trainees will be able to explain what anemia is and the consequences of untreated anemia.
5. Trainees will be able to explain why the WIC Program tests its participants for iron-deficiency anemia.

Module 1: Activity 1

TRAINER NOTE: Allow trainees time to read through the activity and answer the questions. Discuss the questions together to check for understanding and consider other appropriate responses.

Directions:
Complete the following table to indicate if/when bloodwork is required for each situation.

Correct responses: (Module 1, Slide 2)

Participant	Is Bloodwork Required Now?	When Will Next Hgb Test be Required?
8-month-old certifying infant	**No**	**During 1-year Certification appointment**
11-month-old certifying infant	**Yes**	**15 months of age (6 months after initial test)**
16-month-old certifying infant	**Yes**	**22 months of age (6 months after initial test)**
2-year-old with below-normal Hgb recorded 3 months ago during Certification appointment	**No**	**In 3 months (since last Hgb test was below normal)**
3-year-old with normal Hgb recorded 1 month ago during Certification appointment	**No**	**In 11 months during next Certification appointment**
Certifying pregnant woman	**Yes**	**30 days postpartum**
Postpartum woman certifying her 7-day-old infant	**No**	**After at least 23 more days**

Module 1: Activity 2

TRAINER NOTE: Allow trainees time answer the questions below. Discuss the questions together to check for understanding and consider other appropriate responses.

1. What is hemoglobin and what are its most important functions in the body?

Possible response: (Module 1, Slide 7)

- **Hemoglobin is a protein found in red blood cells. It is used to bring oxygen to cells throughout the body, and is also used to bring carbon dioxide back to the lungs.**

2. How are low hemoglobin levels associated with anemia?

Possible response: (Module 1, Slide 8)

- **Without enough hemoglobin, the body isn't able to build enough healthy red blood cells, resulting in anemia.**

3. What is anemia and what are the risks associated with it?

Possible response: (Module 1, Slide 8)

- **Anemia is a medical condition caused by a lack of healthy red blood cells. People with anemia are at a higher risk of infections, decreased work performance, difficulty learning, growth retardation, prematurity, low birth weight, infant mortality, and insufficient breastmilk.**

4. Why do we screen WIC participants for iron-deficiency anemia?

Possible response: (Module 1, Slide 18)

- **Iron-deficiency anemia is the most common type of anemia in the world. The groups most likely to develop iron-deficiency anemia include children and women of childbearing age. Since these are the same groups of people commonly participating in the WIC Program, we can help to reduce the prevalence of iron-deficiency anemia by testing hemoglobin and providing referrals and education to those with low hemoglobin values.**

Module 2: Masimo Pronto

TRAINER NOTE: It is recommended for you to review the competencies below with trainees.

MODULE 2 COMPETENCIES:

1. Trainees will be able to identify the appropriate lancet to use with different participants.
2. Trainees will be able to identify the steps of determining a participant's hemoglobin value using the HemoCue Analyzer.
3. Trainees will be able to identify proper safety precautions to take in order to obtain hemoglobin blood values using the HemoCue Analyzer.
4. Trainees will be able to identify the steps to take to determine a participant's hemoglobin value using the Masimo Pronto.
5. Trainees will be able to identify the main features of the Masimo Pronto.
6. Trainees will be able to describe the steps to take when choosing a finger to analyze to determine a participant's hemoglobin value using the Masimo Pronto.

Module 2: Activity 1

Directions:
Complete the following table by identifying which participants are able to have their hemoglobin measured with the Masimo Pronto, and which will need to have their hemoglobin measured via capillary sampling. The first row has been completed for you.

Participant	Masimo Pronto	Capillary Sampling
Pregnant Woman	✓	

1. A woman has dark fingernail polish and you are unable to get a reading with the Pronto. When you complete the screening using the HemoCue, which lancet does your agency recommend using? (Refer to the AZ WIC Laboratory Procedure Manual.)

Possible responses:
- **Lancet with length of 2.4 mm or less**

2. You decide to perform a heel puncture on a 12-month-old child with small fingers to complete the anemia screening. Which lancet does your agency recommend using? (Refer to the AZ WIC Laboratory Procedure Manual.)

Possible responses:
- **Lancet with length of 1.5 mm or less**

3. Match each of the following steps for performing hemoglobin tests with a HemoCue to its description. (Refer to the AZ WIC Laboratory Procedure Manual.)

Letter	Steps	Descriptions
_N_	Assemble Supplies	A. Wash hands with soap and water. If a sink is unavailable, cleanse with an alcohol-based hand cleanser or hand wipes. Put gloves on now or after supplies are assembled.
_I_	Fill the Cuvette	B. If any blood spills on the HemoCue Analyzer, work surfaces, or skin, clean with a 10% bleach solution or disinfectant spray immediately.
_J_	Seal and Bandage the Site	C. For infants, position the foot below the infant's heart. Encircle the heel by wrapping the index finger around the arch and the thumb around the bottom of the heel. Grasp the heel using your thumb in a gentle rocking movement. For everyone else, lightly press the finger from the closest knuckle to the tip in a rolling motion to stimulate the flow of blood to the sampling point.
_M_	Choose Site	D. Assure that the consent boxes are checked and the client or Authorized Representative has signed and dated the Rights and Obligations form.
_F_	Disposal of Supplies	E. The finger should not be cold, blue, swollen, or calloused. If cold, warm the finger by holding it in your hands, rubbing it for a minute, or by having the participant wash their hands vigorously with warm running water and soap or gently shake their hands.
_P_	Position Client	F. Discard all contaminated materials (i.e., lancets and cuvettes) in a special receptacle usually referred to as a "sharps" container. Throw away other potentially-infectious trash that is saturated with blood in a red, plastic biohazard bag. Waste, such as lint-free tissue, alcohol preps, gloves, bandages, and wrappers that contain blood but are not dripping can be discarded in a regular trash bag.
_E_	Warm the Finger (if necessary)	G. For infants 9-12 months of age, or children 12-18 months with very small fingers, puncture only on the medial or lateral side of the bottom surface of the heel. For everyone else, puncture the side of the fingerpad nearest the thumb in one continuous motion using a retractable lancet.
_B_	Cleanse Surface	H. Discard gloves and wash hands after each client and after handling contaminated waste.
_K_	Explain Procedure	I. To ensure accuracy, wipe away the first two drops of blood and collect the third drop. Ensure the drop of blood is big enough to fill the entire cuvette, including the tip. Avoid "milking" the finger.
_O_	Measure Hemoglobin Value	J. Place dry gauze or lint-free tissue over the puncture site and apply gentle pressure until the wound has stopped bleeding. Elevating the hand or foot above the level of the heart will help to stop the blood flow. Apply the bandage. Do not use bandages on the finger of a child less than two years old to prevent potential ingestion and choking.
_C_	Hold the Site	
_L_	Cleanse the Site	
_D_	Identify Client	
_H_	Remove Gloves and Wash Hands	
_G_	Puncture	
_A_	Cleanse/Glove Hands	

Continued on next page

Letter	Steps	Descriptions
		K. In simple terms, describe to the participant the steps you will be taking to measure their hemoglobin. Reassure them, especially when using an invasive hemoglobin test such as the HemoCue 201. L. Clean the finger or heel with an alcohol pad or with warm water and soap. M. Use a heel for infants and children with very small fingers. Use a finger for everyone else. Choose the finger (middle or ring, but choose a finger that doesn't have a ring on it or have the participant remove the ring). N. Gather all necessary supplies (i.e., lint free wipes or gauze, alcohol prep pad, cuvette, bandage, lancet, 10% bleach solution or disinfectant spray, sharps container, HemoCue machine). O. Pull the cuvette holder out to the loading position. Turn the analyzer on by pressing and holding the On/Off button until the display is activated. Place the cuvette in the cuvette holder, and slide the cuvette holder into the HemoCue machine. P. For infants and children with very small fingers up to 18 months of age, have a seated adult hold the infant/child over their shoulder, or have the baby lay face-down across the adult's lap for a heel stick. For everyone else, seat them with their arm extended and palm facing up.

4. What do you do if the cuvette does not fill completely on the first try, or if air bubbles are visible? (Refer to the AZ WIC Laboratory Procedure Manual.)

Possible responses:

- **Discard the cuvette, wipe the puncture site, and allow a new, larger bead of blood to form before collecting into the cuvette again. If additional blood is not available, a new finger stick must be performed.**

Module 2: Activity 2

Universal precautions to prevent bloodborne illness are not required for using the Masimo Pronto because the test is not invasive. Participants' skin is not punctured and blood is not present. However, close contact with people involves the risk of transmitting contagious diseases by physical contact or airborne pathogens.

1. Explain what precautions are taken to reduce the risk of disease transmission when using the Masimo Pronto for hemoglobin screening.

Possible responses:

- **The lab area used to perform tests is disinfected regularly.**
- **WIC staff use hand sanitizer or wear protective gloves to reduce exposure of WIC staff and clients to potentially contagious agents.**
- **Alcohol is used to cleanse the participant's finger (or thumb when appropriate) before inserting into the finger sensor.**
- **The Pronto device and sensors can be disinfected occasionally to remove the buildup of dirt, oils, etc. from daily use.**

2. Briefly describe the steps in choosing a finger and appropriate placement in the finger sensor when performing a hemoglobin blood test using the Masimo Pronto. (Refer to the AZ WIC Laboratory Procedure Manual.)

Possible responses:

- **Choose a middle or ring finger; thumbs for small children are acceptable.**
- **Avoid fingers with rings or tight jewelry.**
- **Use digit gauge to determine whether the child sensor or adult sensor is needed.**
- **Align sensor with finger, shield from excessive light during test.**
- **Keep cable from twisting or looping.**

3. Explain the main features of the Masimo Pronto device and how to interpret normal display messages seen during a test, including: PI, Hb, Low SIQ Indicator, Battery Level Indicator, Spot Check Progress Indicator. (Refer to the AZ WIC Laboratory Procedure Manual.)

Possible responses: (From the AZ WIC Laboratory Procedure Manual.)

- **PI: Perfusion Index, indicator of blood circulation. PI should be 1.0 or higher to complete a test.**
- **Hb: Hemoglobin, indicates numerical value of hemoglobin result in g/dL.**
- **Low SIQ Indicator: Low Signal IQ light appears when device's signal strength is too low to complete a test.**
- **Battery Level Indicator: Shows approximate charge remaining for batteries. Low battery level does not affect accuracy of test results, but may take longer to complete readings.**
- **Spot Check Progress Indicator: Bars light up from bottom to top to indicate the progress of a test. Test is complete when the topmost bar lights up.**

4. Order the following steps (Step 1 to Step 14) for obtaining a hemoglobin blood value using the Masimo Pronto. (Refer to the AZ WIC Laboratory Procedure Manual.)

Step __9_	Pulse indicator light will flash with each heartbeat.
Step __3_	Pronto will display the number of sensor uses (tests) remaining on the sensor.
Step _13_	SpHB data will display for five minutes while the sensor is attached to the finger.
Step __1_	Press power button to activate the Masimo Pronto.
Step __7_	Dashes appear to indicate testing has begun.
Step _10_	It will take one to three minutes for the Pronto to acquire and display an SpHB measurement.
Step __5_	Insert selected finger into the sensor to begin testing. You may use the thumb, middle, or ring finger of either hand.
Step __2_	Pronto runs a self-test.
Step _11_	The Spot Check Progress Indicator incrementally illuminates from bottom to top and an audible tone will sound when the SpHb measurement is ready to display.
Step __4_	When the Masimo Pronto reads SEN OFF, it is ready for testing.
Step _14_	After removing the sensor from the finger, SpHb data is available for four minutes by pressing either the up or down arrow.
Step __6_	Scrolling zeros appear and this indicates sensor initialization.
Step __8_	The letters “PI” will automatically display after start-up in the lower window. The upper window will show the numerical reading of the PI.
Step _12_	Press SpHb button when ready to view SpHb results.

Supplemental Hematology Training

TRAINER NOTE:

- **Instruct trainees to complete all the modules of the Hematology LMS course and Guidebook, and afterwards, facilitate the Supplemental Hematology Training.**
- **To complete Supplemental Hematology Training, meet with the trainee(s) in a WIC clinic lab (preferably the one the trainee(s) will be using most often).**
- **With the trainee acting in the role of a WIC participant, demonstrate all of the steps necessary to obtain hemoglobin blood values using both the HemoCue Analyzer and Masimo Pronto.**
- **Afterwards, have the trainee practice obtaining your (or another trainee's) hemoglobin blood values using both the HemoCue Analyzer and Masimo Pronto.**
- **Have the trainee(s) continue practicing until you feel confident in their ability to obtain hemoglobin blood values using both the HemoCue Analyzer and Masimo Pronto.**
- **Throughout the Supplemental Hematology Training, answer any questions from the trainee(s), correct any mistakes, and confirm all of the necessary steps for using both the HemoCue Analyzer and Masimo Pronto to obtain hemoglobin blood values.**

You will receive Supplemental Hematology Training from your trainer to ensure your confidence when obtaining hemoglobin blood values using both the HemoCue Analyzer and Masimo Pronto.

After you've completed all modules of the Hematology LMS course and the associated activities in this guidebook, speak with your trainer to determine when they would like to facilitate Supplemental Hematology Training with you.