HemoCue

HemoCue® Hb 301 System Training

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Agenda

- Hb 301 system introduction
- Product specifications
- Quality control
- Microcuvettes
- Getting started
- Proper capillary sampling technique

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The HemoCue® Hb 301 System

The Hb 301 system is an ideal choice for primary care and blood donation settings. The system includes the HemoCue® Hb 301 Analyzer and single-use Hb 301 microcuvettes.

Intended Use

The Hb 301 system is intended for quantitative determination of hemoglobin in primary care or blood donation settings. The Hb 301 system is intended to be used to determine the hemoglobin concentration for adults, adolescents, children, and infants above 1 month old in primary care setting. The Hb 301 system is intended to be used to determine the hemoglobin concentration for adults in blood donation settings. The Hb 301 system is for professional in vitro diagnostic use only.





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The HemoCue® Hb 301 System

Hb 301 system package includes the following components

- Hb 301 analyzer
- Hb 301 microcuvettes
- AC adapter
- Package inserts
- Operating manual



Accessories purchased/requested separately

- AA batteries (4)
- HemoCue® Cleaner



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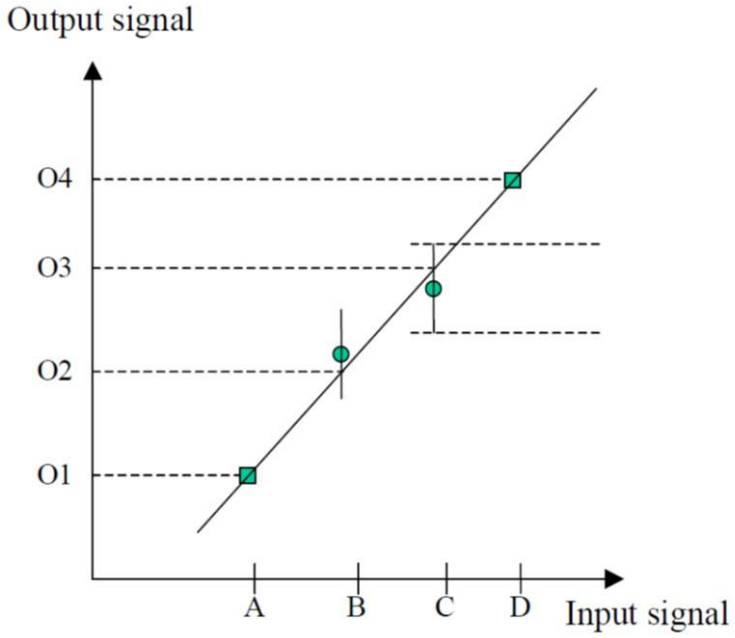
The HemoCue® Hb 301 Analyzer Specifications

- CLIA-waived
- Factory calibrated with no further need for recalibration
- **Measuring time:** within 3 seconds
- **Sample volume**: 10µL
- **Wavelengths**: 506 nm (hemoglobin) and 880 nm (turbidity)
- **Measuring range**: 0–25.6 g/dL
  - If "HHH" is displayed, the result exceeds the measuring range of the system
  - Values above 23.0 g/dL must be confirmed using a suitable laboratory method
- Easy to use, automatic closing cuvette holder
- Powered by AC adapter or 4 AA batteries
- Optional audio signal
- Error codes displayed for various potential malfunctions or conditions; refer to the troubleshooting guide in the operator's manual (pages 10-11)

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Quality controls – electronic self-test

- The Hb 301 analyzer has an internal self-test that verifies the optronic unit of the analyzer is functioning properly; an error code will display if the self-test fails
- The self-test is performed at start-up and every second hour thereafter if left on
- The self-test performs a four-point linearity across the measuring range, confirming the optical unit is working within proper limits



Technical Letter 02 Internal Self Test

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Quality control – liquid controls

- The analyzer has an internal quality control, the “self-test,” verifying that the optronic unit of the analyzer is working properly
- Liquid controls are used to help assure that the entire system is functioning properly, both microcuvettes and analyzer
  - Liquid controls are not a requirement of the Hb 301 system; follow local regulatory regarding quality control procedures
- There are controls available for the Hb 301 system



HemoTrol Duo Three Levels:

- Low ~7 g/dL
- Normal ~13 g/dL
- High ~17 g/dL

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The HemoCue® Hb 301 Microcuvettes

- Serves as a pipette and measuring vessel
- Holds approximately 10µL of blood
- Capillary, venous, or arterial blood may be used
- Made of polystyrene plastic
- Contains no active ingredients
- Package size: 4 vials x 75 microcuvettes
- Storage conditions:
  - **Opened or unopened vial** (**50-104 °F**): until the expiration date printed on each package
  - Unopened short term/transportation (0-122 °F): up to six weeks



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Sample material

- Capillary, venous, or arterial blood may be used
- Venous sample: anticoagulant (e.g. EDTA or heparin) should be used, preferably in solid form to avoid dilutional effects



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Getting started

- If AC power is available, use the power adapter



- If no power is available, insert four type AA batteries, 1.5 V
  - The analyzer will power off after five minutes of inactivity, to preserve batteries



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Using the Hb 301 analyzer



- Pull the cuvette holder out to the loading position



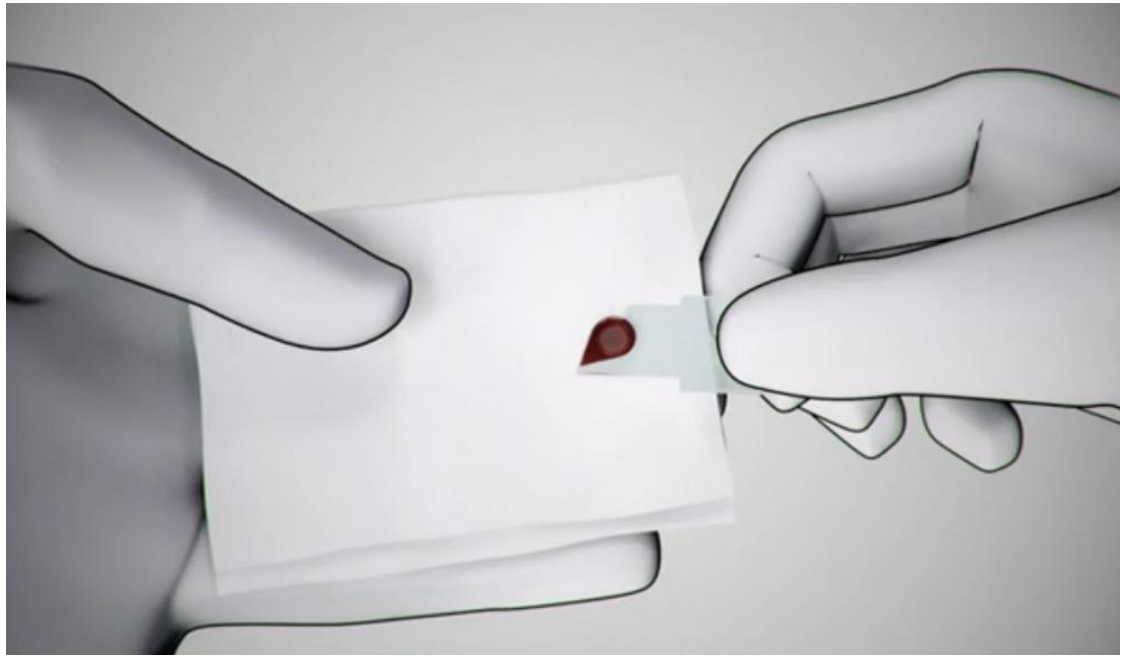
- Press and hold the start button until the display is activated
- The analyzer automatically performs a self-test



- After about 10 seconds, the display will show three flashing dashes, indicating that the analyzer is ready for use

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Three simple steps



- Completely fill the microcuvette with a drop of blood
- Wipe off cuvette and do not refill



- Place the filled microcuvette into the analyzer within 40 seconds of filling



- Receive a lab-quality result, within 3 or 10 seconds, depending on the version of the analyzer

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Using the Hb 301 analyzer

- Result will be displayed in g/dL (grams per deciliter)
- If the cuvette holder remains in the measuring position, the result will remain on the display
- Record the result
  - **No result storage**
- Pull the cuvette holder out to the loading position and dispose of the microcuvette in an appropriate biohazard container; this will clear the last displayed value
- Once the display shows three flashing dashes, another test may be performed



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Daily maintenance

- Remove and clean the cuvette holder at the end of each day of use, using alcohol (20-70%) or a mild detergent
- Wait 15 minutes and ensure the cuvette holder is completely dry before re-inserting it into the Hb 301 analyzer



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As-needed maintenance

- The optronic unit should be cleaned as directed in the Troubleshooting Guide of the Hb 301 Operating Manual
- When cleaning the optronic unit, allow the unit to fully dry for 15 minutes before re-inserting the microcuvette holder



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Helpful troubleshooting tips

No power

- Make sure the HemoCue adapter is in place and the cable (cord) is not damaged
- Check the batteries
- Make sure the adapter cable (cord) has been removed from the Hb 301 Analyzer if battery power is being used

The Hb 301 analyzer shows an error code

- Turn the analyzer off and wait 30 seconds before turning it on again
- Refer to the Troubleshooting Guide in the Operating Manual (pages 10-11) for explanations of other ERROR codes and corrective actions to be taken

Call HemoCue technical support at 800.426.7256

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Participant preparation

- The participant should be seated
- Ensure the hand is warm and relaxed
- It is best to use the middle or ring finger
- Fingers which have tight rings on them should not be used for testing, unless the rings are removed



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Collection site priming

- Prior to performing the puncture, “prime” the fingertip by applying pressure at the upper joint with your thumb, using a rolling motion towards the tip of the finger
- Observe finger for locations that would interfere with proper blood collection i.e., scar tissue, callouses, and non-perfusion
- Do not “milk” the finger, i.e., sliding your thumb from the palm of the hand toward the puncture site



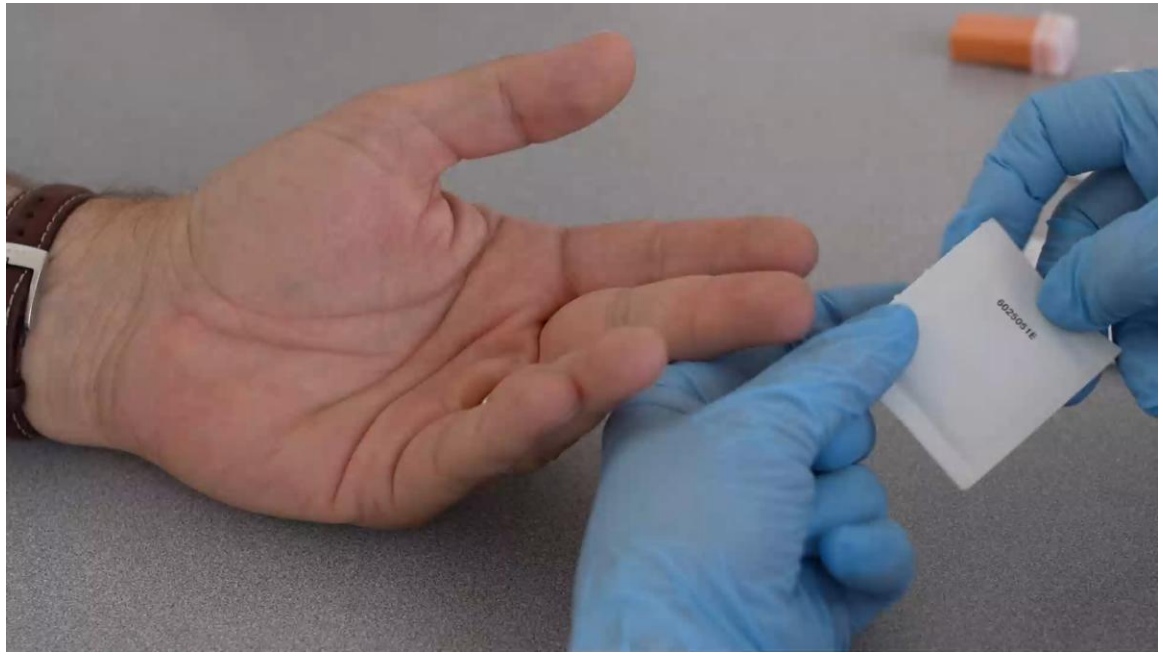
Observe the base on the fingernail is on the forefinger of the screener

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Collection site preparation

- Clean the fingertip (puncture site) with alcohol; this ensures a clean puncture site, removing contamination

- Wipe the alcohol with a dry lint-free wipe or allow to air dry completely
  - Alcohol that remains on the finger may not only cause discomfort, but may dilute the sample



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Lancet placement

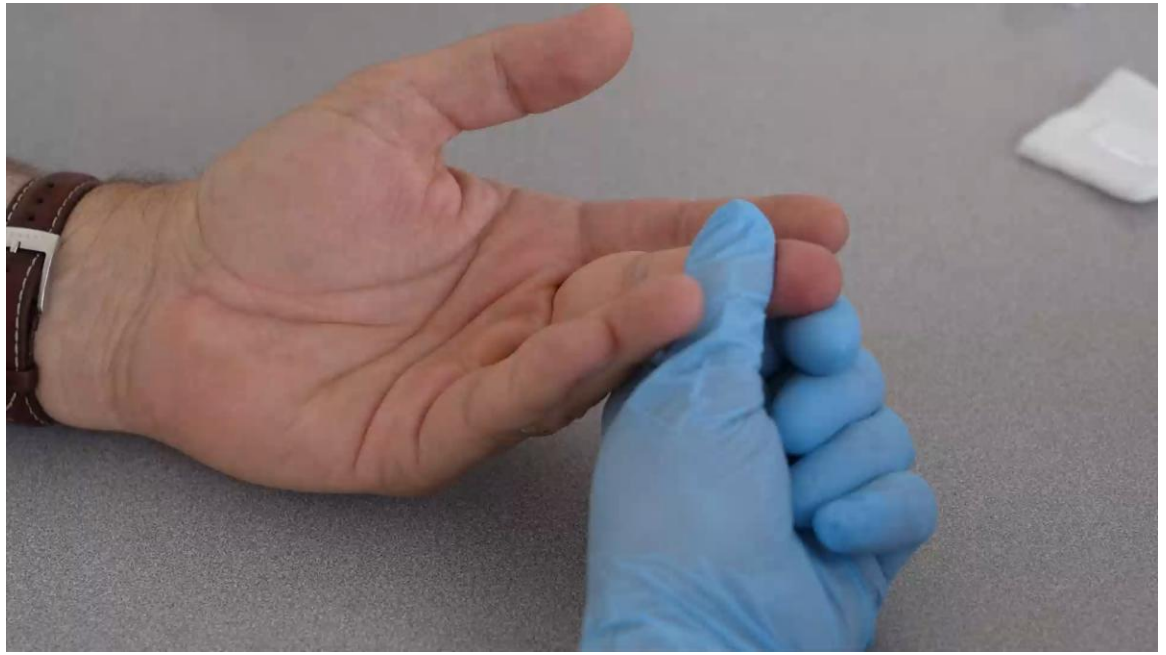
- Roll forward and maintain a gentle pressure
- Position lancet on the thumb side of the donor's finger
- Position the lancet off-center on the fingertip at the 11 or 1 o'clock position
- Press the lancet firmly against the finger to activate
- This position allows for maximum puncture depth and ensures the lancet has activated and retracted



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Lancet activation

- Firmly hold the lancet in place until you activate
- Keep pressure applied until you hear the lancet discharge, then remove - this allows for maximum puncture depth and ensures the lancet has punctured and retracted
- Avoid a “flying stick,” the lancet needs to be firmly placed against skin
  - A flying stick is when you don’t hold the lancet firmly in place and remove it prior to the lancet being discharged



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Sample collection - Size of the drops are important

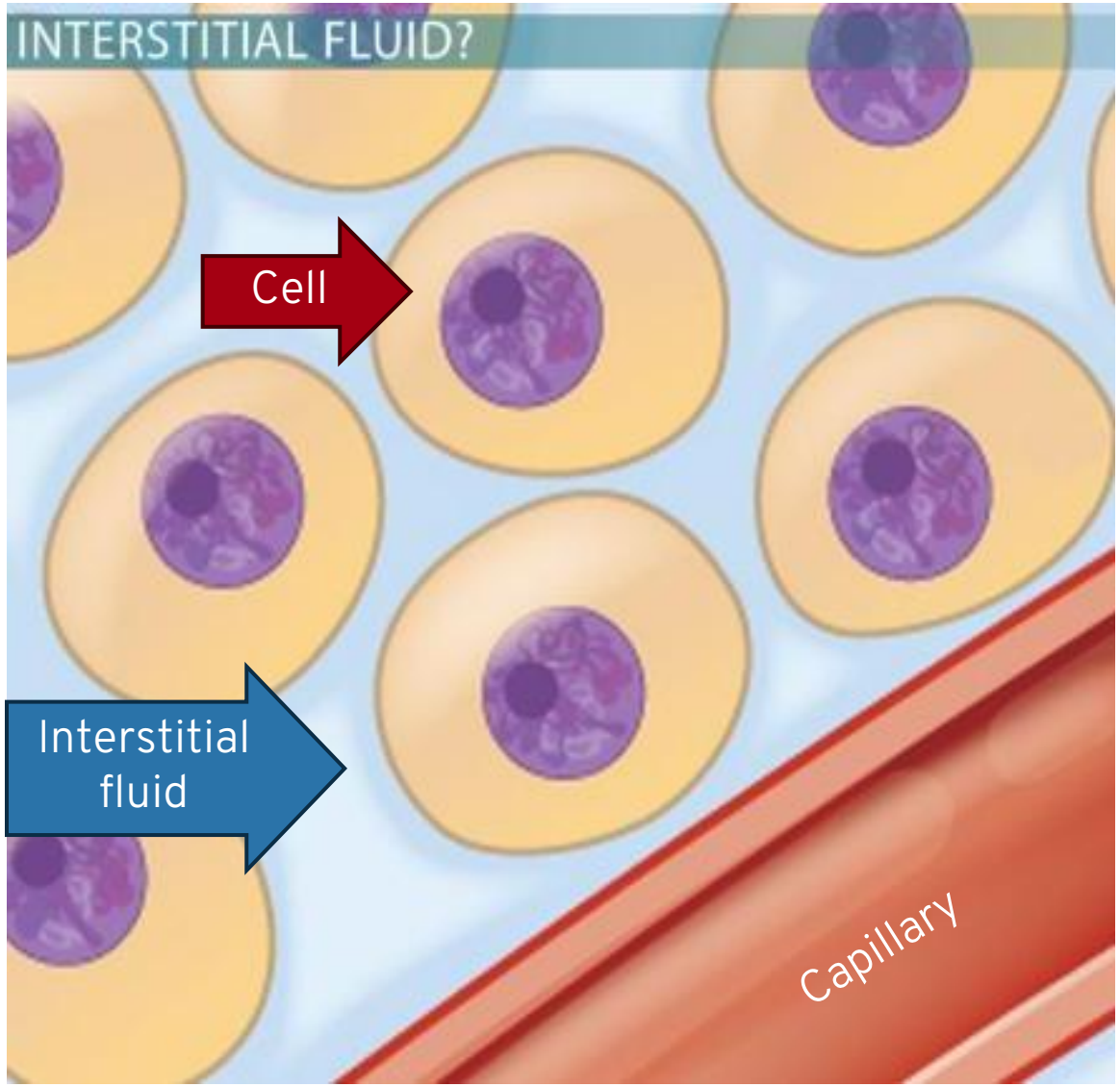
- After the puncture has been made, apply firm pressure as needed to extrude a large drop of blood, avoid squeezing and excess pressure
- At the end of the rolling motion, leave pressure on the fingertip to allow blood to be expressed
- Remember to release your thumb pressure between rolls to observe capillary refill
- It's important to slow down and get properly sized blood drops to wipe away prior to filling the cuvette
- **Wipe away 2-3 pea-sized (large) drops of blood**



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Interstitial fluid

- Interstitial fluid (IN-ter-STIH-shul) is a clear fluid that surrounds all the cells within the body. The fluid comes from leakage from cells and capillary blood vessels
- Excess interstitial fluid can dilute the hemoglobin concentration within a sample, causing falsely low results
- The first 2-3 drops of blood typically contain excess interstitial fluid, which is why wiping the first 2-3 drops is important to obtaining an accurate sample

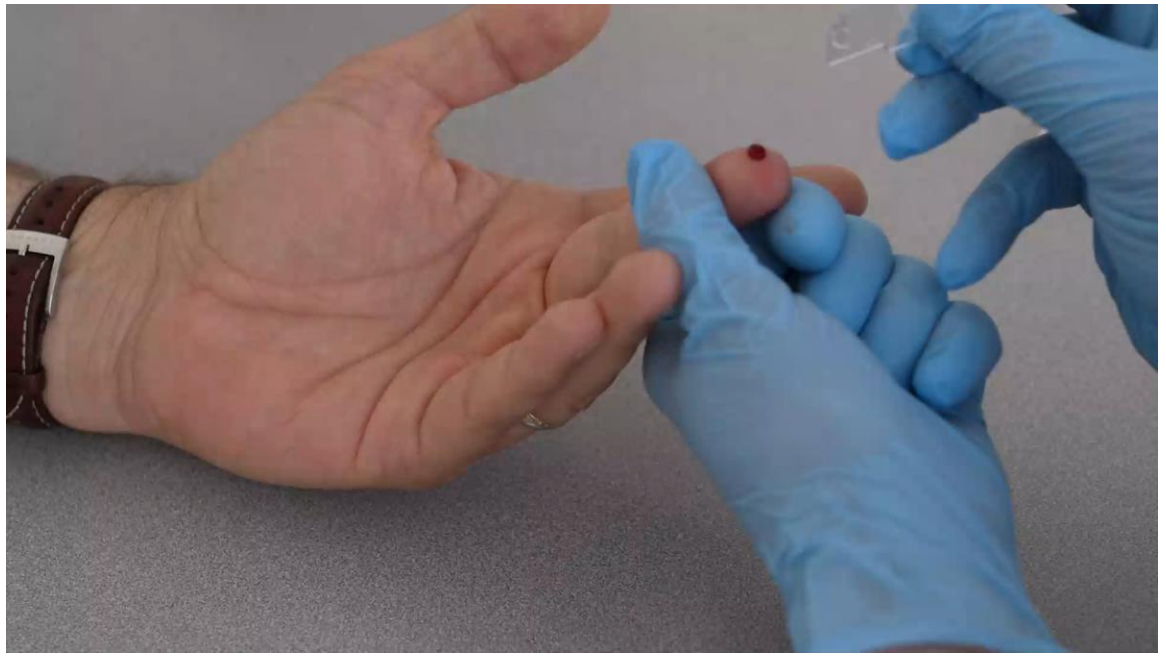


Definition of interstitial fluid - NCI Dictionary of Cancer Terms - NCI
Body Fluids and Fluid Compartments | Anatomy and Physiology II (lumenlearning.com)

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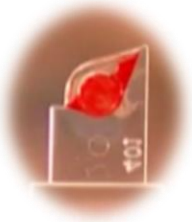
Sample collection

- Hold the microcuvette on the opposite side of the filling end and insert the tip of the cuvette into a large drop of blood
- Hold the microcuvette in place until the entire teardrop shaped cavity is filled with blood
- If the microcuvette is not completely filled, discard and use a new microcuvette
- Do not refill (add blood) to a partially filled microcuvette





Correct:
Fully filled

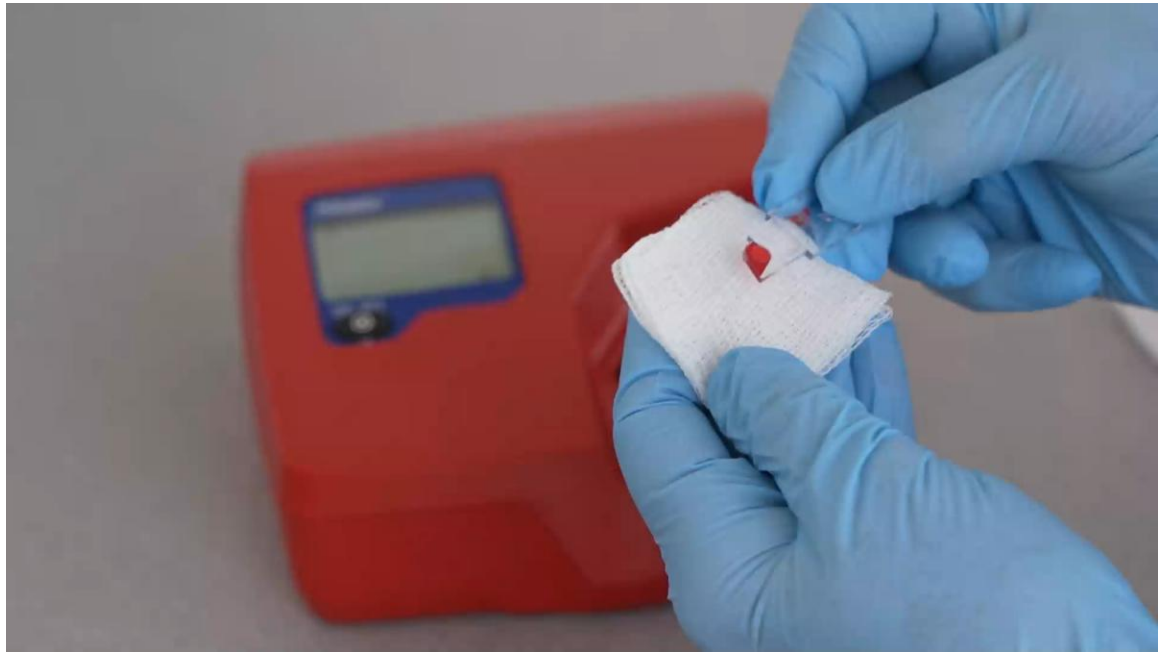


Incorrect:
Partially filled

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Post collection

- Wipe the excess blood from the outer surfaces of the microcuvette with a lint-free wipe; wipe both of the flat sides and the back straight edge of the microcuvette
- Be careful not to touch the open end of the microcuvette with the wipe; this may cause blood to be removed which could produce an erroneous result
- Place the microcuvette in the microcuvette holder and gently push the cuvette holder to its measuring position
- After testing, dispose of the lancet, microcuvette, and other biohazardous material as required according to local policy



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Reminders

- Make sure the lancet is placed firmly on the fingertip (off-center) prior to activation
- Make sure 2-3 large drops of blood are wiped away prior to filling the microcuvette
- No “milking” or “squeezing”
- Make sure the Hb 301 Microcuvette is filled completely in one continuous motion
- No “Double Dipping”
- Make sure blood is not drawn out of the microcuvette when wiping the outside
- Make sure there are no air bubbles in the optical eye of the microcuvette

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Capillary sampling video



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WHO lancet recommendations: Pediatrics



Pediatrics 1.5-2.4mm lancet depth is recommended

- For a child over 6 months and below 8 years – 1.5 mm
- For a child over 8 years – 2.4 mm

Too much compression should be avoided, because this may cause a deeper puncture than is needed to get good flow.[1]

CLSI Standard

For fingertip sampling: Fingers are acceptable capillary puncture sites for adults and for older children. Fingers of newborns and infants less than 6 months of age must not be used for capillary blood collection as the small fingers increases the risk of bone injury and infections.

For children between 6 and 12 months of age, the decision to use the finger instead of the heel must be based on the child's weight.
For infants more than 10 kg, the finger can be used as long as the lancet depth does not exceed 1.5 mm.[2]

1. WHO guidelines on drawing blood: best practices in phlebotomy. 9789241599221_eng.pdf;sequence=1 (who.int)
2. (CLSI. Collection of Capillary Blood Specimens, 7th ed CLSI Standard GP42. Clinical and laboratory Standards Institute; 2020) https://clsi.org/standards/products/general-laboratory/documents/gp42/

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WHO lancet recommendations: Adults

Adults 2.0-2.2mm lancet depth is recommended

WHO Recommendations

A lancet slightly shorter than the estimated depth needed should be used because the pressure compresses the skin; thus, the puncture depth will be slightly deeper than the lancet length.

In a finger-prick, the depth should not go beyond 2.4 mm, so a 2.2 mm lancet is the longest length typically used.[1]



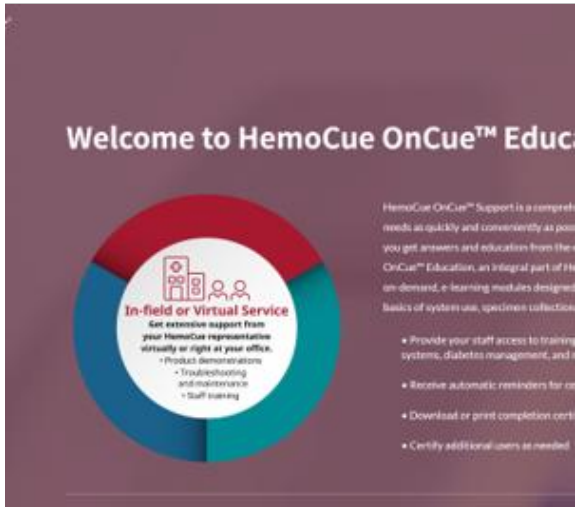
1. WHO guidelines on drawing blood: best practices in phlebotomy. 9789241599221_eng.pdf;sequence=1 (who.int)

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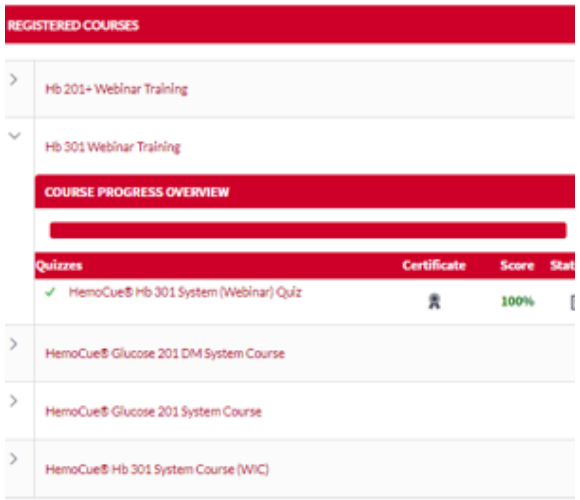
Training website

OnCue™ Education, an integral part of HemoCue OnCue™ Support, is a series of on-demand, e-learning modules designed to ensure your team is trained on the basics of system use, specimen collection, and product maintenance.

- Provide your staff access to training on HemoCue products (hematology systems, diabetes management, and more)
- Receive automatic reminders for certification renewal of operators
- Download or print completion certificates
- Certify additional users as needed
- www.HemocueOncue.education









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Contact Information

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References

- HemoCue® Hb 301 System Operating Manual 901814_220211
- HemoCue® Hb 301 System Package Insert 151811_220211

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Thank you

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