Plasma Hemoglobin HemoCue®

I. PURPOSE AND OBJECTIVE:

The HemoCue® Plasma/Low Hb System is used for the quantitative determination of low levels of hemoglobin in plasma. The system includes a specially designed Low Hb Photometer and Low Hb Microcuvettes. The microcuvette contains reagents deposited on the inner walls. The sample mixes with the reagent when it is drawn into the microcuvette by capillary action. Sodium nitrite converts hemoglobin to methemoglobin which, together with sodium-azide, forms azidemethemoglobin. The absorbance is measured by the Photometer at two wavelengths, 570nm and 880 nm. The hemoglobin concentration is calculated automatically.

II. CLINICAL SIGNIFICANCE:

Plasma Hemoglobin is useful for determining whether hemolysis is occurring in vivo. Plasma hemoglobin is increased with intravascular hemolysis, ABO incompatible transfusion, falciparum malaria, burns and march hemoglobinuria. Slight increases may occur with extravascular hemolysis, delayed transfusion reactions, and sickle cell anemia.

III. SPECIMEN COLLECTION AND HANDLING:

A. Lithium Heparin is the preferred sample.
B. Sodium Heparin or Lithium Heparin PST are acceptable
C. Centrifuge the sample to separate the plasma.
    1. Transfer plasma to a plastic aliquot tube and centrifuge the aliquot tube.
    2. Transfer plasma from the centrifuged aliquot to a fresh aliquot tube.
D. Cell free plasma is stable for 2-4 hours at Room Temperature or 7 days refrigerated.

IV. REAGENTS

A. HemoCue® Plasma/Low Hb Microcuvettes
    1. Store at 15-30°C. Do not refrigerate.
    2. Use prior to expiration printed on the package.
    3. Stable for 3 months once the vial is opened.
    4. Keep the vial tightly closed after use.
    5. All unused microcuvettes should remain in the original package.

V. CALIBRATION:

The Photometer is factory calibrated against the International Reference Method for hemoglobin testing. No recalibration should be performed.

VI. QUALITY CONTROL:

A. 3 levels of Plasma/Low Hb Control are assayed daily.
B. Allow the vial to stand at room temperature for 15 minutes to warm.
C. Gently mix the vial 8-10 times before sampling.
D. Dispense a drop of the QC material onto a hydrophobic surface, ie parafilm or aluminum foil for sampling.
E. QC is stable for 30 days once open when stored at 2-8°C

VII. PROCEDURE:

A. The On/Off switch is located at the back of the photometer. Switch on the photometer and place the microcuvette holder in its loading position. The holder must be clean and completely dry before inserting a microcuvette to be measured.
B. The photometer is ready for use (~ 15 seconds warm-up) when flashing dashes and "Ready" are displayed.
C. Remove the number of microcuvettes required for the controls and samples from the container. Close the container immediately. Hold the microcuvettes at the winged (rear) end. Do not touch the optical eye of the microcuvettes.
D. Holding the microcuvette by two fingers at the rear end, bring the filling end in contact with the liquid.
E. Allow the cavity of the microcuvette to fill (~20 L) completely by capillary action. There should not be bubbles. Do not refill the microcuvette if bubbles are present, use a fresh microcuvette.
F. Use a Kimwipe to wipe the outside of the correctly filled microcuvette, taking care not to touch the slit at the filling end.
G. Within one minute of filling, place the microcuvette in the microcuvette holder of the photometer.
H. Carefully push the microcuvette holder in the measuring position. Avoid forcing or slamming the microcuvette holder into place.
I. When the microcuvette holder is in the correct measuring position, fixed dashes and "Measuring" will be displayed.
J. The result will be displayed within one minute and will remain on display as long as the microcuvette holder is in the measuring position.
K. Pull the microcuvette holder to its loading position and discard the used microcuvette into a biohazard container.
L. Wait for the "Ready" message to appear before filling another microcuvette.
M. Switch off the photometer if it is not be used for several hours.

VIII. INTERPRETATIONS:

The result is displayed in mg/dL.

IX. EXPECTED VALUES:

<30 mg/dL

X. REPORTABLE RANGE:

30 – 2000 mg/dL

XI. INTERFERING SUBSTANCES:

A. Plasma Hemoglobin **will not** be reported from samples with a Total Bilirubin > 15.0 mg/dL,. Report "Unable to perform due to interference" in the comment area of the LIS.
B. Samples that are cloudy or lipemic will be cleared by ultracentrifuge using the Beckman Airfuge.

XII. MAINTENANCE

A. Clean the cuvette holder daily
    1. Remove the cuvette holder.
    2. Clean with an alcohol swab.
    3. The cuvette holder must be completely dry before reinserting into the analyzer.
B. The Optic Unit is cleaned if an error code is displayed (ERROR 901-905).
    1. Remove the cuvette holder.

2. Push a HemoCue Cleaner swab into the opening of the optic unit.
3. Move the cleaner back and forth 5-10 times.
4. If the swab is stained, repeat with a new swab.
5. Wait 15 minutes and replace the cuvette holder.

XIII. TROUBLESHOOTING:

Refer to the Operators Manual page 14

XIV. REFERENCES

Operating Manual for the HemoCue® Plasma/Low Hb Photometer.