

11. Elderly, Home, Hospital And Long-Term Care Collections

A. Introduction

1. Laboratory testing and of delivery have expanded beyond the laboratory and many terms are utilized to describe testing done outside the traditional laboratory:
 - a. Decentralized laboratory testing
 - b. On-site testing
 - c. Alternate-site testing
 - d. Near-patient testing
 - e. Patient-focused testing
 - f. ***Point-of-care testing (POCT)***
 - g. Bedside testing
2. Other health care providers will increasingly perform on-site laboratory testing.
3. POCT is increasing, especially for the geriatric population, keep in mind special conditions requiring special interpersonal skills needed when dealing with this age group:

Hearing loss

 - a. Failing eyesight, loss of taste, smell and feeling
 - b. Memory loss
 - c. Tissues become thinner.
 - d. Muscles become smaller.
 - e. Increased susceptibility to hypothermia.
4. Special considerations for home collections:
 - a. Have extra supplies and equipment handy.
 - b. Take special care in identifying the patient.
 - c. Place patient in a comfortable, reclining position.
 - d. Locate nearest bathroom with sink and towels.
 - e. Carefully inspect area after procedure, remove all trash and supplies.
 - f. Carefully label samples and put in leak proof container or bag.
 - g. Check phlebotomy site before leaving.

B. Glucose Monitoring

1. Most widely used point-of-care test.
2. Used to determine blood glucose levels to determine appropriate treatment for patients with diabetes mellitus.
3. Small glucose measuring devices have become commonplace in home, nursing home and hospital bedside testing.
4. Uses finger stick whole blood and a special reagent pad which changes color in the presence of glucose, the color produced is directly proportional to the amount of glucose present in the patient's blood.

5. Most popular method is the reflectance meter:
 - a. After placing blood drop on strip timer is pressed.
 - b. When timer goes off strip is inserted into machine.
 - c. Machine will “read” and display numerical results.
 - d. Helps diabetics monitor blood glucose to adjust insulin level.
6. Proper training of personnel and quality control of the instrument is critical.
 - a. Careful adherence to manufacturer’s instructions.
 - b. Daily quality of control of the instrument with specific instructions on how to deal with malfunctioning equipment.
 - c. Careful recording of all results and documentation of problems and corrective action.

C. Blood Gas and Electrolyte Analysis

1. Blood gas analysis involves measurement of the partial pressure of oxygen (PO_2), the patient’s carbon dioxide (PCO_2), and pH.
 - a. PO_2 and PCO_2 are analyzed when a patient has a heart or lung disorder.
 - b. Blood pH determines whether the blood is too acidic or too alkaline.
2. The I-STAT instrument is a very popular POCT device which can monitor blood gases and electrolyte levels - sodium, potassium, chloride and bicarbonate levels.
3. These instruments require preventive maintenance and quality control similar to glucose-monitoring instruments.
 - a. Because more than one analyte is measured the operation, QC and maintenance is more complex.
 - b. It is critical that only well trained individuals use the instruments.

D. Blood Coagulation Monitoring

1. Similar to glucose monitoring, blood coagulation monitoring through POCT can provide immediate results that can be used in controlling bleeding or clotting disorders in patients.
2. CIBA Corning Biotrack 512 coagulation monitor is a hand held instrument that can measure the prothrombin time (PT) and activated partial thromboplastin time (APTT) from an unmeasured drop of whole blood, providing results within 3 minutes.
3. Proper training in use, preventive maintenance and QC is critical.

E. Hematocrits, Hemoglobin, and Other Hematology Parameters

1. The hematocrit represents the volume of whole blood which is RBCs and is expressed as a percentage.
 - a. Hematocrits are used to aid in the diagnosis of anemia.
 - b. For accurate results do not squeeze finger too hard.

2. Hemoglobin is the substance in the RBC which transports oxygen to the tissue, measurement of hemoglobin is used to aid in the diagnosis of anemia.
 - a. The American Medical Association (AMA) has determined that the hemoglobin is more accurate than the hematocrit.
 - b. The HemoCue B-Hemoglobin System is a POCT hemoglobin analyzer which uses venous, capillary or arterial whole blood placed in a microcuvette and inserted into the instrument to provide a patient's hemoglobin value.
 - c. Automated cell counting machines are now available to perform platelet count, hemoglobin, hematocrit, WBC count and RBC count.

F. Cholesterol Screening

1. Very popular for health fairs.
2. Some instruments are moderate in size and portable, drop of whole blood is placed on a special strip, inserted into the machine, and a result is displayed.
3. Another type of screening procedure (AccuMeter) use whole blood and a visual evaluation of the colored bar height of the cholesterol reaction.

G. Future Trends

1. More POCT procedures are evolving at a rapid rate.
2. Phlebotomists, nurses, patient care technicians and other individuals providing healthcare will be involved in using these new techniques
3. It is critical that proper training on any POCT instrument include:
 - a. Preventive maintenance
 - b. Quality control
 - c. Calibration requirements
 - d. Troubleshooting