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Specimen Collection, Patient Preparation and Specimen Handling, 400.00

POLICY:

Blood and urine samples constitute over 90% of all specimens analyzed in the clinical laboratory; the remaining 10% are, material submitted for culture, stools, cytological and surgical specimens. Blood can be considered as the major biological fluid on which quantitative analysis are performed. Consequently, specimen requirements are most rigorous for blood samples. Whole blood is used in the blood bank and in hematological analysis, while serum is used for most of the chemical analysis.

Before performing the actual analysis, one must be sure of the quality of the specimen. The analytical results on bad specimens are not only useless but also misleading and sometimes dangerous to the patient involved. It is the responsibility of the analyst to see that the samples analyzed are free from any interference or deterioration.

In order to minimize large blood draws unnecessarily, the technician uses the smallest size Vacutainer blood collection tube possible to provide adequate sample for testing.

REQUIREMENTS FOR THE PERFECT SAMPLE:

A. The correct specimen from the right patient: Personnel must confirm the patient's identity by checking at least two identifiers before collecting a specimen.
   - INPATIENT:
     Positive ID of the patient by checking the patient armband. Verify the patient's name and date of birth.
   - Ask the patient to state their name and date of birth.
   - Label the specimen with the two patient identifiers at the time of collection and in the presence of the patient. Refer to Policy 200.00 Proper Labeling of Specimens.
   - OUTPATIENT:
     Ask the patient to state their name and date of birth.
     Verify that information against the outpatient registration form. Specimen is properly labeled with the two patient's identifiers at the time of collection and in the presence of the patient.

B. If it is a plasma sample, the correct anticoagulant is used.

C. Blood sample after centrifugation is free of hemolysis and is not turbid.

D. The sample is fresh or has been properly preserved and stored. The preservative was added when required to make sure the constituent is there when the analysis is performed.

E. If it is a timed specimen, it is timed properly. For example, a 24 hour urine specimen should be collected from 7 a.m. one morning to 7 a.m. the next morning.

F. There is adequate patient preparation before collecting the specimen.

PROCEDURE:

A. Patient Preparation
Patient preparation is an important factor in many tests. The results will be either diagnostically misleading or useless if the patient preparation is inadequate. Some examples of the nature of patient preparation are as follows:

1. A proper oral glucose tolerance test can be performed only if the patient has had an adequate carbohydrate diet (250 g/day) for at least 3 days before the test and the patient should be fasting the morning of the test.
2. The patient should **fast** for the following tests:
    a. Fasting blood glucose
    b. Oral glucose tolerance test
    c. Two hour post prandial after glucola (if ordered with fasting BS)
    d. Two hour post prandial after meal (if ordered with fasting glucose)
    e. Comprehensive Metabolic Panel (Preferred)
    f. Cholesterol and Triglycerides plus HDL requires a minimum of 9-12 hours fasting
    g. Lipoprotein phenotyping requires a minimum of 9- 12 hours fasting.
    h. A fasting specimen is **desirable** for analysis of electrolytes, uric acid and inorganic phosphorous.

B. Specimen Collection

1. **Blood Collection**
    a. ***Venipuncture***: Blood is aseptically drawn from the antecubital vein, by the vacuum tube method. The needle is double pointed; one end goes into the skin and the other into the vacuum tube. Application of a tourniquet helps in locating the vein, but it will not be left for a long period of time or the stasis may alter the specimen constituents. The tourniquet will be released before the needle is removed. The tube should be filled to the top and the blood mixed thoroughly when an anticoagulant is used.
    b. Recommended Blood Draw Volumes for Pediatric Patients:

Weight (lbs)	Maximum volume of Blood Draw (mL)
4.4	4
8.8	8
13.2	12
17.6	16
22.0	20

27.6	25
33.1	30
38.6	35
44.1	40
49.6	45
55.1	50
60.6	55
66.1	60
71.7	65
77.2	70
60.6	75
88.2	80
93.7	85
99.2	90
104.7	95
110.2	100
115.7	105
121.3	110

c. The following order- of- draw is recommended when several specimens are drawn during a single venipuncture.

   a. Blood culture tube (yellow stopper)
   b. Coagulation tube (blue stopper)
   c. Serum tubes with or without additive (red stopper)
   d. Heparin tubes with or without gel (green stopper)
   e. EDTA tubes (lavender stopper)
   f. Glycotic inhibitor (gray stopper)

d. 1. Gently invert tubes immediately following collection. Allow blood to clot at room temperature and then centrifuge to separate serum from clot within 1 hour of collection.

In cases where a specimen from an individual with fragile or thready veins needs to be drawn, a needle and syringe (or a winged blood collection set) may be used. The procedure for venipuncture is generally the same as vacuum tube system with extra precautionary safety measures employed by using the blood transfer devices when filling the tubes.

The patient's venipuncture site is checked and bandage applied after bleeding stops. General notes: At the first sign of a reaction during a venipuncture, remove the tourniquet and withdraw the needle. Call for assistance.

- *Fainting*: Place patient with head down between knees (or reclining position with feet elevated) and loosen tight clothing.Apply cold compresses to forehead or back of neck.
- *Nausea/Vomiting*: Instruct patient to breath slowly and deeply. Provide suitable receptacle for vomit.
- *Convulsions*: Call for immediate medical aide. Prevent patient from injuring themselves. If possible place tongue blade wrapped with adhesive tape between the back teeth to prevent them chewing their tongue. Be sure patient has adequate airway.

* Complete Incident form and turn into Laboratory manager. You can ask the patient if they would like to been seen by the ER physician. If so have the patient register as an ER patient.

For further information regarding venipuncture procedure, please refer to NCCLS document H3-A4 ***Procedures for the Collection of Diagnostic Blood Specimens by Venipuncture***; Approved Standard -- Fourth Edition, June 1998, page 4, Section 7

e. ***Capillary puncture***: Procedure for Capillary Puncture of the Finger: • The best site for a finger puncture is just off the center of the finger pad of the 3rd (middle) or 4th (ring) finger of the hand. The sides and the tip of the finger should be avoided. • Select the proper lancet: The BD Microtainer Contact-Activated Lancet 1.5 mm (lavender) is used for glucometers and the BD Microtainer Contact-Activated Lancet 2.0 mm (blue) is used any time you need more than a drop or two of blood. • Prepare the finger by cleaning it with a Chlorhexadine wipe. Allow it to air dry. • Grasp the finger, and using a sterile lancet, press firmly against the finger to make a puncture. • The first drop contains excess tissue fluid and must be wiped away. Collect the drops of blood into the collection device by gently massaging the finger. • Avoid excessive pressure that may squeeze tissue fluid into the drop of blood or cause bruising. • When full, cap and then gently invert the collection device 5-10 times to mix the blood. • Hold a gauze pad over the puncture site for a short time to stop the bleeding. • Dispose of the contaminated materials and lancet in the appropriate waste containers. • Place a band-aid on the patient's finger or have someone continue to hold gauze on the finger. (See "Use of Band-Aids in the Post Phlebotomy policy.) • Label the specimens before leaving the patient's bedside. Procedure for Capillary Puncture of the Heel: •A heel puncture is performed on the lateral or medial plantar surface of the foot. The area of the arch should be avoided, as should the posterior curvature of the heel; a puncture in these areas could cause injury to the underlying bone. • All babies in the neonatal unit must be warmed before performing a puncture. Begin by selecting the proper, approved lancet, such as: ? BD Microtainer Quikheel Lancet, 2.5 mm for full-term babies (green) ? Heel Lancet, 1.75 mm for neonatal babies (purple) ? Unistick2 Neonatal 18G, 1.2mm Lancet for neonatal babies less than 1000g (blue) • Prepare the heel by cleaning it with a Chlorhexadine wipe. Allow it to air dry. • Grasp the foot, and using a sterile lancet, press firmly against the heel to make a puncture. • The first drop contains excess tissue fluid and must be wiped away. Collect the drops of blood into the collection device by gently squeezing the foot. Avoid excessive pressure that may squeeze tissue fluid into the drop of blood or cause bruising. • When full, cap and then gently invert the collection device 5-10 times to mix the blood. • Hold a gauze pad over the puncture site for a couple of minutes to stop the bleeding, and then tie gauze around the foot. (See "Use of Band-Aids in this policy.) • Dispose of the contaminated materials and lancet in the appropriate waste containers. Label the specimens before leaving the patient's bedside. The skin (finger for adults, heal or toe for infants) is punctured by a sterile lancet. Blood is collected in capillary tubes for appropriate microtainers. Capillary puncture or

finger stick is limited to amount of blood obtained but is easy to handle after proper training. Tube must be probably labeled with two patient identifiers. The footie from the barcode label can placed on the tube.

f. ***Fresh specimens:*** A fresh specimen is always desirable for studies. This means within a few hours after the specimen is collected that it should be analyzed or properly stored until testing is performed. More specific information is found in the detailed listing which follows.

g. ***Port Drawn specimens:*** Laboratory does not perform this procedure. Procedure is referred to nursing department. Please refer to nursing manual for protocol. Laboratory shall assist in the draw to maintain specimen integrity.

2. **Urine Collection**

   a. Random collection is the most common method of specimen collection for routine urinalysis. Specimens will be properly labeled when submitted to laboratory for analysis. This includes the patient's full name, date if birth, date and time of collection. This information will also be on the request slip accompanying the specimen to the laboratory. Specimen should be brought to the laboratory within 30 minutes of collection so that they may be examined within 2 hours of collection. Chemical changes and disappearance of casts and bacterial growth occur when the urine stands at room temperature. If the specimen cannot be tested within 1 hour of collection, it should be refrigerated.

   b. A morning specimen is recommended as the first choice per instructions in the Clean Catch Kit in sterile, mid-stream container.

   c. 24 hour urine collection should be done by asking the patient to completely void at 7 a.m. on the day the collection is begun. The patient should be properly instructed to collect all urine until 7 a.m. the following morning when he/she is asked to completely void. The first specimen collected at 7 a.m. on the first morning of collection is discarded. All urine after that is "saved". The 7 a.m. specimen on the following morning is also saved and specimen with the proper request slip is sent to the laboratory. Lab should be consulted as to patient preparation, diet, and preservative to use in certain instances. See detailed listing which follows.

3. **Collection of OVA and Parasites**

   SPECIMEN: Appropriate amount of fecal specimen in Para-Pak collection kit.

   PRINCIPLE: The ability to detect and identify intestinal parasites is directly related to the quality of the specimen submitted to the Laboratory. Certain guidelines are recommended to ensure proper collection and accurate examination of specimens.

   NOTE: For a routine examination for parasites prior to treatment, a minimum of 3 fecal specimens is recommended. For best results, the fecal specimens should be collected on alternate days.

   PATIENT PREPARATION:
   Collection of fecal specimens for intestinal parasites should always be performed prior to radiologic studies involving barium sulfate.

   The following is a list of drugs and preparations which when passed with feces render the specimen unsatisfactory for parasitic examination and the minimum number of days which must elapse following administration for the specimen to be considered adequate for examination.

Iron Salts	7 to 10 days
Barium	7 to 10 days
Magnesium	7 to 10 days
Aluminum	7 to 10 days
Kaolin drugs (Kaopectate)	7 to 10 days
Antibiotics, Tetracycline	7 days
Oil Laxatives	7 days
Enemas - A Fleets enema may be used to provide a stool specimen if this is the only way a specimen is obtainable. Sodium sulfate may be used for a surgical specimen.	

COLLECTION: FECAL SPECIMEN FOR O&P

1. Fecal specimens should be collected in clean wide-mouthed containers with a tight fitting lid.
2. The laboratory will supply the wide-mouthed container along with a Para-Pak kit containing two bottles, one bottle containing formalin and the other containing PVA for preservation of specimens from time of collection until time of delivery to the lab. Do not pour these liquids out. Read the instructions that come with the Para-Pak.
3. After collecting fecal specimen in the wide-mouth container, transfer appropriate amounts to the Para-Pak collection kit until the liquid level in the Para-Pak bottles reach the red dotted line. Return all three containers to the laboratory.

COLLECTION: CULTURE SPECIMENS

1. Specimens submitted for Culture or Culture and Sensitivity should be collected before the patient receives therapy. All specimens should be handled promptly. CSF should receive immediate attention. The specimens are refrigerated only in the case of an anticipated delay.
2. Specimen Acceptability Criteria:
   Inspect for: absence of gross external contamination, dried swabs
   - Correct Specimen Type/ Quantity/Preservative
   - Correct use of transport media
     a. ***Blood*** -- Blood is collected with an anticoagulant which does not inhibit growth. Blood must be aseptically collected with special attention to preparation of arm at site of venipuncture. Nurse or Technologist performing venipuncture will be careful not to contaminate the specimen. Blood culture is commonly requested in case of septicemia and subacute bacteria endocarditis. Draw for 1 aerobic bottle and 1 anaerobic bottle.
     b. ***Urine*** -- A urine specimen is collected in case of suspected renal infection. The first morning "midstream" specimen is suitable for bacterial culture. Random specimens are also accepted as long as the following collection technique is observed. The urethral area should be cleaned and collection made in a sterile container. A Cath specimen is collected by Nursing staff. The specimen will be processed immediately or refrigerated in case of delay.
     c. ***Throat and nasopharyngeal swabs*** -- Throat and nasopharyngeal swabs are

collected in culturettes from patients with respiratory tract infections such as septic throat. These are to be properly preserved in the culturette.

d. ***Wound exudate*** -- Wound exudate is submitted via an aerobic culturette or an anaerobic transport medium depending upon the type of wound. Consult physician as to specific orders if in doubt.

e. ***Fecal material and rectal swab*** -- These specimens are submitted for the diagnosis of typhoid (Salmonella) and digestive disorders (Shigella), Campylobacter, E. coli O157. Feces are usually collected early in the day and MUST be cultured immediately. If not immediately transported to the lab for culturing the other bacteria (normal flora) present will rapidly overgrow the pathogenic bacteria which are diagnostically important.

f. ***CSF*** -- This is obtained by Lumbar Puncture performed by the physician. Some of the pathogenic organisms associated with it are mandatory that rapid transport of the specimen to the lab be done.

g. ***Ear and Eye Exudate*** -- Submit on culturette with proper request slip.

h. ***Sputum*** is submitted for Mycobacterium infection (Tuberculosis) and for infections of the lower respiratory tract. Best sample obtained early morning upon arising, using a deep cough. Refrigerate until delivery to lab.

- NOTE: The time of collection for culture and sensitivity must always be documented in the hospital order entry computer system.

3. Specimen collection for Blood Bank
   a. Positive patient identification is mandatory. Specimen must be labeled with Patients name, date of birth, unique account number, date and time of collection.
   b. EDTA whole blood.
4. Cytology and Surgical Specimens

   These will be properly collected and preserved. Refer any questions to the pathologist. It is imperative that the pathologist be provided with all pertinent clinical information available on the patient.
5. Reference Lab Specimens

   Follow the reference lab collection and handling specifications. These can be found in the computer information system, on line LabCorp test menu and Directory of Service Manual. Specimen temperature, transport time, interval before separation of blood cells from serum/ plasm, correct anticoagulant specifications must be followed. Provide any clinical information to the reference lab if needed.
6. Coagulation Specimens
   - Collect in Blue Tube containing (3.2%) sodium citrate. Tubes must be filled to the fill line.
   - Collection of blood for coagulation testing through intravenous lines that have been previously flushed with heparin should be avoided, if possible. If the blood must be drawn through an indwelling catheter, the line should be flushed with 5 ml saline, and the first 5 ml

blood or 6 times the line volume be drawn off and discarded before the coagulation tube is filled.

- For samples collected from a normal saline lock twice the dead space volume of the catheter and extension set should be discarded.

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Attachments

No Attachments

Approval Signatures

Approver	Date
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