Purpose/Principle

Since the accuracy of laboratory testing procedures is crucial to the proper diagnosis and treatment of the patient, it follows that the sample on which the testing procedure is performed must also be in the best possible condition. It must be collected properly, collected from the correct patient and it must be handled, transported and stored until testing in such a way as not to compromise the sample. These factors have made the phlebotomist or venipuncturist a very important part of the medical team.

The most expensive and accurate laboratory instrumentation, the cleanest glassware, and the most precise analysis of the test results may not yield accurate results if the sample tested was collected from the wrong patient, was collected improperly, or was not handled appropriately. Not only are results on such samples of no benefit to the patient, they may lead to misdiagnosis and treatment which could harm, or cause death to the patient.

Definitions/Key Terms

Phlebotomy – the collection of blood from patients

Related Documents

FRHG’s Catalog of Laboratory Tests
Acceptance or Rejection of Samples and Requisitions
Transfusion Services Specimen Labeling Requirements

Responsibilities

Nursing Staff with support of unit Ward Clerks, Clinical Laboratory Scientist, Laboratory Phlebotomists – properly collect and label all laboratory samples for laboratory testing using proper technique and collection devices.

Specimen Requirements

Patient Preparation per individual test requirement. Consult FRHG’s Catalog of Laboratory Tests or Specimen Collection Manual for details.

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Equipment and Materials for Blood Collection

- BD Luer-Lok Access Device
- BD Transfer Device
- 10 or 20 cc Sterile Syringes

Ordering Laboratory Tests and Patient Identification

1. Ordering the Laboratory work
   a. Make sure all laboratory orders for inpatients are placed into the hospital information system (HIS). Verify correct patient identification and all tests are ordered. For outpatients order tests on a laboratory requisition. Refer to Acceptance or Rejection of Samples and Requisitions.
   b. If additional tests are required after the sample has been sent to the laboratory, call the laboratory to see if what has been collected is acceptable for the additional tests to be performed. This needs to be verified before ordering the tests in the HIS for inpatients. If the sample is acceptable for the additional tests place the order in the HIS for inpatients or fax a laboratory requisition to the laboratory for outpatients.
   c. All laboratory tests must have a physician’s order.

2. Patient Identification
   a. It is absolutely mandatory to collect samples from the correct patient.
   b. No sample will be obtained from any inpatient or ED (Emergency Department) patient without a hospital identification band. Make certain the full name and hospital identification number on the identification band are identical to those appearing on the label or requisition.
   c. For outpatients ask the patient to state their name and date of birth and match that information with the information on the laboratory requisition.
   d. If the information does not agree DO NOT DRAW THE PATIENT. Resolve the discrepancy prior to collecting the sample.
   e. All samples for inpatients are to be labeled after the sample is collected at the bedside. For outpatients the samples are to be labeled after collection next to the patient.
   f. If a misidentification of a patient occurs after the sample is sent to the laboratory, notify the laboratory immediately.

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g. Samples for transfusion services will be drawn or verified by laboratory staff. Samples for transfusion services can be drawn by non-laboratory staff in the following areas only: surgery, cancer center and dialysis. If the sample is drawn by non-laboratory staff, two staff will verify the identity of the patient and the correct labeling of the sample, refer to Transfusion Services Specimen Labeling Requirements. Both will initial the sample. The transfusion services sample may be drawn from the IV start, but must have both the nurse and laboratory staff initials on the tubes.

1. Using the BD Luer-Lok Access Device for Blood Collection from IV, Arterial, Swan, or medication lines
   a. After verifying patient identification and an IV site has been successfully started, blood collection can be attempted. At no time, if the line site is going to be compromised, should blood collection be a factor. In those cases where the IV or line was hard to start, the tourniquet was on for more than a minute, or several attempts were made, blood collection should not be considered. Laboratory staff will be responsible for phlebotomy in such cases. If the line was perfused with solutions before blood collection, the line should be shut-off for at least 5 minutes and up to 30 minutes as medical staff orders and IV protocols allow.
   b. Attach the sterile BD Luer-Lok adapter to the female luer and/or needle-less IV port. This product is designed for access without using a needle and provides a hands-free connection. **With a sterile red top tube, provided by the laboratory, 5 to 10 mLs of blood should be drawn and discarded before laboratory sample collection.**
   c. It is important to collect the correct tube for the test being ordered. Refer to the FRHG’s Catalogue of Tests to verify the correct sample type. Tube selection is important, and when collecting several tubes of blood, the correct order is required. Listed below is the correct tube order:

   1 - Sterile Blood culture bottles: Contains culture media
   2 - Blue Top: Citrate-containing
   3 - Red Top: No anti-coagulant or serum
   4 - Green Top: Heparin-containing
   5 - Lavender Top: EDTA-containing
   6 - Gray Top: Oxalate/fluoride-containing
d. Whichever anti-coagulant tube you are drawing, it is important to remember two things:
   1. The tube must be filled with the appropriate amount of specimen. Anti-coagulant tubes contain specific amounts of the anti-coagulant for specific amounts of blood. If the tube is under-filled, the anti-coagulant concentration will be too high for the amount of specimen present, which may interfere with the test results. Completely exhaust the vacuum before withdrawing an anti-coagulant tube from the device.
   2. The blood must be carefully and gently mixed with the anti-coagulant. This can be accomplished by gently inverting the tube 5 to 6 times. NEVER SHAKE AN ANTI-COAGULANT TUBE, since this may damage the cells and cause them to break open (lyse). Inverting the tube allows the blood to gently coat the sides of the tube to dissolve powdered anti-coagulants and it mixes liquid anti-coagulant with the entire specimen.

e. Insert the proper tube into the adapter, piercing the top. As blood begins to flow, pay attention to the flow. The blood should come in a steady stream. If the blood flow stops or becomes sluggish, the specimen could be compromised. Replace the tube, if the flow of the blood remains sluggish or has stopped, discontinue the phlebotomy. Do not submit the samples.

f. Once all of the tubes required are collected, release the tourniquet from the arm. Remove the adapter from the port, and continue with the IV process. Dispose of the adapter in the needle box or appropriate sharps container.

g. Nursing staff needs to follow nursing protocol for returning the line back into operation for patient care and as directed by medical staff.
Blood Collection using Syringes from IV, Arterial, Swan, or medication lines

a. After verifying patient identification and an IV site has been successfully started, blood collection can be attempted. At no time, if the line site is going to be compromised, should blood collection be a factor. In those cases where the IV or line was hard to start, the tourniquet was on for more than a minute, or several attempts were made, blood collection should not be considered. Laboratory staff will be responsible for phlebotomy in such cases. If the line was perfused with solutions before blood collection, the line should be shut-off for at least 5 minutes and up to 30 minutes as medical staff orders and IV protocols allow.

b. Insert a 10 cc syringe into the line port, twist on clockwise, and draw off 5 to 10 cc of blood for disposal. Remove syringe by turning counter-clockwise. Dispose of syringe in biohazard container. (Note: If the line is an arterial line, two syringes may be used with a 3-way stopcock and the first 10 cc syringe of 5-10 cc of blood is returned into the patient after the needed blood collection is completed.)

c. Insert a 20 cc syringe into the line port, twist on clockwise, and draw off 5 to 20 cc of blood depending on the testing volume requirements. Remove syringe by turning counter-clockwise.

d. Using the BD Transfer Device, peel off paper backing and remove from package. Keep in packaging before use.

e. Insert tip into syringe into the BD Vacutainer Blood transfer device. Rotate the syringe clockwise until it fits securely on the hub.

f. With syringe facing down, center the blood collection tube or blood culture bottle over the holder portion of the BD Vacutainer blood transfer device and push it in and follow appropriate tube order.

g. After removing the last tube or blood culture bottle, discard the entire assembly into an approved sharps disposal container. Always mix all tubes thoroughly by rocking tubes back and forth 5 to 6 times to ensure all blood samples mix with the anticoagulant in the collection tubes.

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Blood Sample Collection, continued

- h. Tubes can also be filled by removing tube caps and transferring blood immediately from the syringe into the tubes per printed volumes without a needle. Keep the syringe point down and away with the tubes in rack and contained area to prevent splashing or spills. Clean up all splashes or spills with biohazard wipes or kits per hospital policy.
- i. Follow steps c to d from above procedure for BD Luer-Lok Access Device to complete.

Sample Labeling, Physician’s Order and Transportation

1. Labeling the Specimen(s)
   - a. Each sample tube collected must be properly identified. Refer to Acceptance or Rejection of Samples and Requisitions. The laboratory will reject multiple tubes wrapped in a single label.
   - b. All specimens collected for laboratory tests must have the following information on the label:
     - The patient’s Last and First Name.
     - The patient’s Medical Record Number (MR#).
     - The Date and Time of the blood collection
     - The initials of the person performing the collection.

2. Physician’s Order
   - a. All specimens collected by non-laboratory staff should also include a requisition form to accompany the samples when they arrive in the laboratory. From the nursing units the verification form can be used and for outpatients a laboratory requisition. The requisition shall meet the requirements as stated in Acceptance or Rejection of Samples and Requisitions.

3. Transportation
   - a. Transportation to the laboratory is critical for proper turnaround times. Use plastic bags labeled with the biohazard label which can be sealed, and have a separate place for the paperwork to transport the sample to the laboratory from the location of the collection.
   - b. Review the transportation requirements for the tests that have been ordered. Refer to the FRHG’s Catalog of Laboratory Tests
   - c. If special requirements are needed (sample on ice, etc) follow the procedure as indicated. Samples may be rejected if the samples are not transported to the laboratory as required. Inform laboratory personnel when arriving at the laboratory of the priority of the sample. Be sure to clock in the sample’s requisition at the time of delivery to the laboratory.
Unacceptable Samples

Examples of unacceptable specimens for testing include:

- Tubes not filled to correct level
- Clotted samples
- Hemolyzed specimens
- Wrong tube type
- Specimen quality or quantity is inadequate
  a. Specimens received improperly labeled, mis-labeled or not labeled will not be accepted by the laboratory.
  b. All specimens must conform precisely to the stated specimen requirements and handling. Refer to Acceptance or Rejection of Samples and Requisitions.
  c. The laboratory staff, upon receipt of an unacceptable specimen will notify the ordering location of the sample rejection. An appropriate reason will be entered into the LIS (Laboratory Information System) for the unacceptable sample. If a new sample is collected it will be assigned a new accession number. An OCR (Occurrence Report) will be initiated for the rejected sample. This will allow the laboratory to review sample collection practices to help improve and maintain specimen quality. Collection by non-laboratory staff will have to conform to the laboratory standards for acceptable samples.

Safety Considerations

a. Follow Standard and Blood-borne Pathogen precautions. Treat all samples as potential hazardous eliminates the need for warning labels.

b. All employees should use appropriate barrier protection when collecting, handling and transporting samples.

c. Do not contaminate the external surface of the collection tube and or its accompanying paperwork.

d. Minimize direct handling of samples in transit from patient to the laboratory.

Questions

If there are any concerns about correct blood collection or sample transport, please call the laboratory for assistance. This procedure should be a guide and the laboratory will decide the acceptability of any sample collected for testing.

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References

1. Fremont Rideout Phlebotomy Training Manual, current
3. Fremont Rideout Health Group, General Laboratory Policy and Procedures, Patient Identification, Acceptance Rejection of Samples and Requisitions and Specimen Transportation.
5. Clinical and Laboratory Standards Institute, 2003

Affected Departments: Laboratory, Laboratory Services