Specimen Collection, Preparation, Packaging and Courier Services

The patient and the patient's specimen must be positively identified at the time of collection. The collection container must be identified with a firmly attached label bearing at least the following information:

- Blood specimens:
  - —Patient's first and last name
  - —Identification number or date of birth (DOB)
  - —Date and time of collection
  - —Indicate if serum or type of anticoagulant used if specimen has already been centrifuged, separated, and aliquot sent.
- Specimens other than blood:
  - —Patient's first and last name
  - —Location/source of specimen
  - —Identification number or DOB
  - —Date and time of collection

Blood and urine specimens collected by nursing personnel should be returned to the laboratory for testing within 60 minutes of the time of collection. Microbiology specimens should be returned to the laboratory as soon as possible. STAT tests should be returned within 15 minutes of the time of collection. Collection date and time must accompany every specimen.

Laboratory orders should be placed in the computer before sending specimens to the laboratory. If a computer-generated order is not available, a properly completed "Downtime Form" must be submitted along with the specimen. Nurse collected specimens must be labeled with the patient's full name directly on the specimen. Specimens arriving unlabeled or mislabeled will be rejected.

Blood Collection

Most laboratory tests are performed on anticoagulated whole blood, plasma, or serum. In general, specimens should be refrigerated until placed in the courier box for transport to the laboratory. Please see our individual test directory section for specific requirements.

- *Plasma*: Draw a sufficient amount of blood with indicated anticoagulant to yield necessary plasma volume. (It requires approximately 2 times the volume of whole blood to obtain 1 volume of plasma.) Gently mix blood collection tube by inverting 8 to 10 times immediately after draw. If required, separate plasma from cells by centrifugation.

- *Serum*: Draw a sufficient amount of blood to yield necessary serum volume. (It requires approximately 2 times the volume of whole blood to obtain 1 volume of serum.) Allow blood to clot at ambient temperature, and then, separate serum from clot by centrifugation. Caution: Refer to individual test listing within the test catalog to see if use of a hemolyzed sample is acceptable.

- *Whole Blood*: Draw a sufficient amount of blood in appropriate tube. If a tube with an anticoagulant is used, gently mix blood collection tube by inverting 8 to10 times immediately after draw to facilitate mixing and prevent clotting.

Fasting

Fasting laboratory instructions:

- Do not eat or drink for 10 hours before Lab work.
- You may drink up to one full 8 oz. glass of water.
- If you have diabetes, talk with your doctor about when to schedule snacks.
- Do not consume alcohol the evening before Lab work.
- Take your medications as usual, unless instructed otherwise.

Order of Draw

The following order of draw should be followed when obtaining multiple tubes during a single venipuncture. Its purpose is to avoid possible test result error due to cross contamination from tube additives. This policy should be followed for both evacuated tubes and syringe transfer of blood to multiple tubes.

- Blood culture bottle(s) or tube(s) drawn for fungal or viral cultures
- Light blue-top (sodium citrate) tube(s)
- Plain, red-top (no additive), red-top (clot activator), clot activator and gold-top (gel separator) tube(s)
- Green-top (heparin) with or without gel separator tube(s)
- Lavender-top (EDTA) tube(s)
- Grey-top (potassium oxalate/sodium fluoride) tube(s)
- Any other additive tube(s)

Coagulation testing: If only a coagulation tube is to be drawn, for routine coagulation testing (eg APTT and PT), the first tube drawn may be used for testing. For special coagulation testing (eg Factor VIII), the second or third tube drawn should be used for such testing, drawing a waste tube first (no additive or sodium citrate) if necessary. If difficulty is encountered when drawing a specimen for coagulation testing and probing is necessary, another tube must be drawn before the coagulation specimen.

If a winged infusion set is used to collect blood into a VACUTAINER® and the first tube drawn is a sodium citrate tube, a waste tube (no additive or sodium citrate) must be used first to displace the air volume in the winged infusion set tubing. If this is not done, the volume of blood collected into the tube will not be adequate and the specimen will be rejected.

Please refer to individual tests within the *Test Catalog* for instances of special considerations and the need for an alternative order of draw.

Specimen Collection Tubes Available

The following is a list of tubes referred to in specimen requirements:

- *Gold-Top (Serum Gel) Tube:* This tube contains a clot activator and serum gel separator—used for various laboratory tests.
  Note: Invert tube 8-10 times to activate clotting; let stand for 30 minutes before centrifuging for 10 minutes. If frozen serum is required, pour off serum into plastic vial and freeze. Do not freeze VACUTAINER®.
- *Green-Top (Lithium or Sodium Heparin) Tube*: This tube contains lithium or sodium heparin—used for drawing heparinized plasma or whole blood for special tests.
  Note: After tube has been filled with blood, immediately invert tube 8-10 times in order to prevent coagulation.
- *Green-Top (Lithium Heparin) Plasma Gel Tube:* This tube contains lithium heparin and a plasma gel separator—used for various laboratory tests.
- *Grey-Top (Potassium Oxalate/Sodium Fluoride) Tube*: This tube contains potassium oxalate as an anticoagulant and sodium fluoride as a preservative.
  Note: After tube has been filled with blood, immediately invert tube 8-10 times in order to prevent coagulation.
- *Lavender-Top (EDTA) Tube*: This tube contains EDTA as an anticoagulant—used for most hematological procedures.
  Note: After tube has been filled with blood, immediately invert tube 8-10 times in order to prevent coagulation.
- *Light Blue-Top (Sodium Citrate) Tube*: This tube contains sodium citrate as an anticoagulant—used for drawing blood for coagulation studies.
  Note: It is imperative the tube be completely filled. Ratio of blood to anticoagulant is critical for valid results. Immediately after draw, invert tube 8 to 10 times in order to activate anticoagulant.
- *Pink-Top (EDTA) Tube*: This tube contains EDTA as an anticoagulant—used for Blood Bank procedures.
  Note: After tube has been filled with blood, immediately invert tube 8-10 times in order to prevent coagulation.
- *Red-Top Tube*: This tube is a plain VACUTAINER® containing no anticoagulant—used for drawing serum for selected chemistry tests as well as clotted blood for immunohematology.
- *Royal Blue-Top Tube*: There are 2 types of royal blue- top tubes—1 with the anticoagulant EDTA and the other plain. These are used in drawing whole blood or serum for trace element analysis. Refer to the individual metals in individual test listings to determine the tube type necessary.
- *Yellow-Top (ACD) Tube*: This tube contains ACD— used for drawing whole blood for special tests.
- *Special Collection Tubes*: Some tests require specific tubes for proper analysis. Please contact your local Essentia Health Clinical Laboratory prior to patient draw to obtain the correct tubes for metal analysis or other tests as identified in the individual test listings within the test catalog.

Microbiology Specimens

The following "General Microbiology Specimen Considerations" should be used for each specimen submitted to microbiology for testing. General Microbiology Specimen Considerations:

- Whenever possible, culture specimens should be obtained before antibiotics or antimicrobial agents have been administered.
- Material for culture should be collected from the site the organism is most likely to be found with as little external contamination as possible.
- Specimens must be adequately labeled with patient's full name (first and last), medical record number and specimen source.
- It is important to include enough clinical information to guide the microbiologist in selection of suitable media and appropriate techniques. Always state if a certain organism or group of organisms is suspected.
- All specimens for culture must be collected with aseptic technique and submitted in sterile containers.
- Specimens must be delivered to the laboratory as soon after collection as possible. As a general rule, if delivery of a specimen is to be delayed s long as 1 hour, a suitable transport media should be used, which will be furnished upon request.)
- Dry swab is **NOT** acceptable. (With the exception of *Chlamydia/Neisseria gonorrhoeae* probes.) Please make sure swab ampules are crushed. Wooden shaft or cotton swabs are not acceptable.

Please refer to specific collection protocol within the *Test Catalog* for each specimen type.

Anatomic Pathology (Cytology and Surgical Pathology) Specimens

Anatomic Pathology specimens must be delivered directly to your Essentia Health Laboratory. Specimens preserved in fixative can be stored and transported ambient. All specimens submitted fresh (without fixative) should be immediately delivered to your laboratory so that they can be stored and transported under refrigeration.

Courier Services

Courier services may be available for transporting specimens to Essentia Health Clinical Laboratory, and to also deliver reports and supplies. Please contact your local EH laboratory for details.

Specimen Transport

Follow proper transport conditions to assure specimen stability and storage requirements outlined in this manual for each test. Avoid exposure to light, excess agitation or vigorous handling during transport. Specimens should be placed into a secondary sealed plastic “BIOHAZARD” labeled bag. Bags containing liquid specimens must also contain absorbent material. Transport specimens as indicated by the test catalog under individual test listings.

Transport temperatures are defined as follows:

Ambient: 18°C to 24°C or 64°F to 75°F
Refrigerated: 2°C to 8°C or 34°F to 46°F
Frozen: -40°C or <32°F

Upon arrival to an Essentia Health Clinical Laboratory, specimens are logged in with the date and time of receipt. EH Clinical Laboratory reserves the right to reject any specimen failing to meet the required acceptable criteria (refer to test catalog for specimen requirements under individual test listing.) When this occurs, the laboratory submitting the specimen will be notified as soon as possible.