

## Blood Collection Tubes

The alphabetical test listing section of this manual details specific specimen requirements including storage temperature, special handling notes and whether testing is performed by HealthLab or a reference laboratory. Storage temperature is specified as either room temperature (18° to 22° C), refrigerated (2° to 8° C) or frozen (-20° C or colder). More extensive instructions for cytology, anatomic pathology, microbiology and challenge test specimen collections are included in following sections.

Using the appropriate phlebotomy supplies is imperative for accurate test results. Each vacutainer tube is color-coded to facilitate proper specimen collection. Please be sure to use the proper tube for the desired test.

### Color Codes for Vacutainer Tubes:

Color	Contents
Lavender	EDTA
Blue	Sodium citrate 3.2%
Light Green	Lithium heparin
Green	Sodium heparin
Gray	Potassium oxalate and sodium fluoride
Plain Red	No anticoagulant; contains clot activator; yields serum
Ivory	Potassium EDTA, for lead testing
Gold	Gel, clot activator; yields serum-SST
Dark Blue	EDTA, for heavy metals testing

It is the responsibility of all personnel who collect laboratory specimens to properly label the specimens to assure accurate patient/sample identification. Please see “Lab Specimen ID and Labeling Instructions” for detailed instructions on proper specimen labeling. Please see “Phlebotomy Procedure” for instructions on the proper order of blood draws.

Specimens for cytology and anatomic pathology studies have unique labeling requirements. Please refer to “Cytology Specimen Collection and Handling” and “Anatomic Pathology Specimen Collection and Handling” in this manual for detailed information on these requirements.

### MINIMUM SAMPLE VOLUMES

The laboratory receives many requests to supply information regarding the minimum sample volumes for lab tests. Of particular concern are pediatric patients from whom excess blood collection must be avoided.

We are unable to provide absolute minimum blood sample volumes for all tests because they require information regarding the patient’s hematocrit and/or the combinations of tests that are to be collected. A combination of multiple tests may share the same dead-volume requirements on analytical equipment, which have to be factored into the requirements.

### MINIMUM VOLUMES FOR COMMON TESTS

The sample volumes listed below are recommended sample test volumes and not necessarily the whole blood collection requirements. The sample volumes are the minimum necessary to assure an accurate test result on patients with normal hematocrits and include repeat testing.

#### CBC with Visual Differential

Collect whole blood to the first line, but not past the second line on a purple microtainer tube (0.25-0.5 ml). If a pediatric vacutainer is used, collect a minimum of 1.5 ml of whole blood.

#### Coagulation Tests

(Protime, APTT, Fibrinogen, D-Dimer): Completely fill a small blue vacutainer tube (2.7 ml) with whole blood. Use the tube vacuum to fill. Do not overfill or underfill. You may also use a pediatric blue vacutainer tube, 1.8 ml, using the same method.

#### Blood Cultures

The minimum draw ranges from 1-20 ml. Split the specimen evenly between two vials. If the amount is less than 1 ml, place the complete amount in the aerobic blood culture vial (purple cap) only. A larger sample is always preferred because the ability to recover an organism is directly dependent on the volume of the blood sample.

The following chemistry tests define the estimated minimum whole blood volume. The actual sample requirement may be more or less, based on the patient’s hematocrit. The actual sample requirement needed for multiple tests may be less than the total of the individual tests combined.

**Electrolytes**

(Na, K, CL, CO<sub>2</sub>): One full light green/SST or red microtainer (0.7 ml) of whole blood.

**Comprehensive Metabolic Panel**

1.2 ml whole blood in a lithium heparin 3.5 ml tube or 1.2 ml total whole blood in two light green, SST or red microtainer tubes.

**Therapeutic Drug Levels**

(Such as, theophylline, phenobarbital, aminoglycoside): 0.5 ml whole blood in a red microtainer tube.

**REJECTION CRITERIA**

- 1 Patient identification is uncertain (i.e., the primary specimen container is unlabeled or illegible).
- 2 The specimen has been obtained, handled, preserved, processed, transported or stored in such a manner that the specimen will not yield accurate or reliable results for the tests ordered.

Examples:

- A coagulation tube is partially filled for coagulation studies.
  - The specimen is hemolyzed when the specimen is submitted for test(s) affected by hemolysis.
  - A specimen for a CBC or coagulation testing contains clots.
  - A specimen requiring refrigeration is sent at room temperature.
  - A urine for culture and sensitivity is in a non-sterile container.
  - The specimen is not in an approved specimen container.
  - The specimen is not protected from exposure to light when required.
  - The specimen is collected in an outdated tube.
- 3 The specimen type is not approved for the testing procedure requested.
  - 4 Clinical information essential for proper performance or interpretation of the test is not available.

**SPECIMEN RETENTION**

All laboratory blood, body fluid and tissue specimens used for on-site testing are retained, refrigerated or frozen for seven days in the laboratory and are readily available for add-on test requests, re-testing or validation of specimen/patient identification, sample integrity, etc.

With the exception of timed urine samples, fecal samples and tissue specimens, all prepared sample slides, primary sample collection containers and aliquot sample tubes from samples tested at Central DuPage Hospital are saved with any remaining sample after testing is completed.

All laboratory specimens, blood films, permanently stained body fluid slides and microbiology slides are saved for a minimum of seven days after testing has been performed, except for the following:

- 1 CSF specimens tested in-house are saved frozen for three months.
- 2 Blood specimens collected as an “extra” sample tube are saved for seven days after collection.
- 3 Urine specimens for routine urinalysis, urine pregnancy testing and/or microbiology studies are saved for one day.
- 4 AFB concentrates are stored at -70°C for three days.
- 5 Significant bacterial isolates are kept frozen for one year for possible epidemiology studies.
- 6 Positive ANAs are stored at -20°C for one week.
- 7 Tissue and cytology specimens are saved for a minimum of two weeks.

Specimens are stored in closed containers to prevent evaporation and at a temperature that is optimum to preserve the specimen integrity for the analytes that were originally ordered. These storage requirements may not be optimum for add-on test requests. To determine if the specimen is acceptable for add-on tests and/or to determine if sample volume is sufficient, please call client services at 630.933.2633.

**SPECIMEN TRANSPORT FOR FROZEN SAMPLES**

Specimens requiring freezing must be frozen as soon as possible and kept frozen during transport. Use a plastic transfer tube and notify the courier to keep sample on dry ice. Submit separate portions for each assay requiring a frozen sample.

Some tests that require frozen samples can be refrigerated until they reach the laboratory. If you have a question regarding the handling of a specimen, please call client service at 630.933.2633.