

Specimen Collection and Preparation

The quality of laboratory test results are dependent upon how carefully instructions for collection, handling, labeling, and storage of specimens are carried out. Pay particularly close attention to type of specimen required as well as handling, storage, and transport temperature.

Specimen requirements for each test are provided in the “Alphabetical Test Listing” section of this catalog. Specimens that must be recollected translate into additional expense and inconvenience to patient, physician, and laboratory. Bellin Health Laboratory provides common supplies for collection of those specimens referred to our laboratory at no charge. Please refer to a list of supplies in “Supplies” in “General Information.” Specialized collection and/or transport supplies may be available at cost.

Any questions regarding a particular specimen collection or handling issue should be directed to Bellin Health Laboratory Customer Service at 920-433-3652 or toll free at 800-236-1639.

Specimen Labeling

Every specimen submitted to Bellin Health Laboratory must be labeled with:

- Patient’s full name, last name first
- Patient’s date of birth
- Date and time of collection
- Tests to be performed on that specimen

Blood Collection Tube Contents

Please note the color of tube cap will vary from supplier to supplier. Bellin Health Laboratory currently stocks the BD VACUTAINER® and Greiner Bio-One brands.

Tube	Contents
Blue-top (2 mL draw)	0.2 mL of 3.2% Sodium citrate (volume critical)
Blue-top (3.5 mL draw)	0.35 mL of 3.2% Sodium citrate (volume critical)
Royal blue-top (7 mL draw)	10.5 mg Sodium EDTA (metal free)
Royal blue-top (7 mL draw)	No anticoagulant (metal free)
Green-top with gel (4 mL or 5 mL draw)	Plasma separator tube 14 I.U. per 1 mL blood

Tube	Contents
Green-top (6 mL draw)	86 USP units sodium heparin
Lavender-top (4 mL draw)	K ₂ EDTA 7.2 mg
Red-top (plain) (6 mL draw)	No anticoagulant
Yellow-top (6 mL draw)	1 mL Acid Citrate Dextrose (ACD) solution B
Red-top with gel (8 mL draw)	No anticoagulant
Grey-top (2 mL draw)	5 mg Sodium fluoride/4 mg potassium oxalate
Grey-top (8 mL urine draw)	Boric acid: 6.7 mg/mL-sodium formate 3.35 mg/mL
Red/yellow swirl (8 mL urine draw)	Chlorhexidine 0.4%/ethyl paraben 5.6%/sodium propionate 94%

Order of draw when using multiple tubes:

- Blood culture bottle
- Light blue-top tube
- Plain, red-top tube
- Serum gel tube
- Plasma gel (green-top) tube
- Lavender-top tube
- Grey-top tube

By collecting tubes in correct order, the possibility of cross contamination with anticoagulant is minimized.

Blood Collection

In general, most laboratory tests are performed on whole blood, plasma, serum, or urine. Following are general instructions for collection. Be sure to check specific test listing for any specialized collection instructions.

- *Plasma*: Draw a sufficient amount of blood into tube containing appropriate anticoagulant using 2 1/2 times the amount rule. Thoroughly mix blood with anticoagulant by gentle inversion (6-10 times) immediately after draw. Separate plasma from cell portion by centrifugation within 20 to 30 minutes. Refrigerated plasma drawn in green-top plasma gel tube (PST) may be left in original tube as long as there is

clear separation of cells and plasma portions. Plasma allowed to remain exposed to cells may be cause for rejection of specimen and test cancellation. If plasma is to be frozen, remove plasma to a plastic transfer tube before freezing specimen. Be certain to properly label any transfer tube and allow for expansion upon freezing.

- ***Serum***: Draw a sufficient amount of blood to yield required serum volume. In most circumstances, amount of whole blood drawn should be about 2 1/2 times the amount of serum necessary. Allow blood to clot at ambient temperature and then separate serum from clotted blood by centrifugation within 20 to 30 minutes of draw. Refrigerated serum collected in red, serum gel tube may be left in original container as long as there is clear separation of cell clot and serum. Serum allowed to remain exposed to cell clot may be cause for rejection of specimen and test cancellation. If serum is to be frozen, remove serum to a plastic transfer tube before freezing specimen. Be certain to properly label transfer tube and allow for expansion upon freezing.
- ***Whole Blood***: Draw a sufficient amount of blood into tube containing appropriate anticoagulant. Thoroughly mix blood with anticoagulant by gentle inversion (6-10 times) immediately after draw. Store tube under appropriate conditions.
- ***Freezing Specimens***: Freeze specimens only when specifically instructed to do so in separate test listing. Some specimens may actually be unsuitable for testing when frozen and thawed. It is extremely important that specimens be frozen as soon as separated from cells. Except in rare cases where frozen cells are requested (red blood cell folate testing), always remove and freeze plasma or serum in a plastic transfer tube provided by Bellin Health Laboratory. Never freeze specimens in glass containers and be sure to allow for volume expansion.
- ***Blood Smears***: It is essential that blood smears are prepared for complete blood counts (CBC), which include a differential white blood count, when there will be any delay in specimen processing. Ideally, slides should be made at or near time of specimen collection. Bellin Health Laboratory cannot guarantee that a differential white blood cell count or a platelet estimation can be performed on specimens that do not have slides prepared at the time or draw, or have improperly made slides. Blood smears are prepared on labeled frosted slides. Include patient's last name, first name, and date of collection. If you are unfamiliar with slide preparation, it may take some practice to produce a

usable slide. Contact Customer Service at 920-433-3652 or toll free at 800-236-1639 for advice after reading the following procedure:

- Transfer a small drop of well-mixed blood to a spot about 1 1/2 inch or less from the frosted section of slide.
- Hold slide containing drop of blood in 1 hand, and with other hand, place end of a second slide in front of drop of blood at an angle of approximately 30 degrees.
- Pull second or spreader slide back into drop of blood. When blood has spread to approximately 2/3 of the width of slide, push spreader slide forward with an even, steady motion. Do not push down on spreader slide, weight of slide is enough pressure. Be gentle and you get a better slide.
- Allow smear to air dry undisturbed. Do not wave slide in air or blow on it.
- Two slides are required for each patient.

A good smear should be free of ridges, lines, and holes. Common errors in slide preparation are trying to use too large of a drop of blood, delaying spreading of drop of blood after applying it to slide, and using a "dirty" spreader slide.

Feces/Stool

Carefully read specimen requirements for specific test. Both random and timed stool collection containers are available from Bellin Health Laboratory.

Microbiology/Virology Specimens

Specimen requirements are included with specific test listings, and a table outlining specific swab transport media is found in "Culture Specimens Transport Media" in "Specimen Collection and Preparation" in "General Information."

Synovial Fluid

Specimen required:

- 3 mL to 5 mL of fluid in a green-top (heparin) tube
 - 7 mL to 15 mL of fluid in a sterile tube or container
- Note:** For an accurate white cell count and differential, an unclotted specimen is needed.

Syringe Specimens

A specimen which has been collected from patient into a syringe should be moved into a more appropriate container for transportation. See separate test listings for correct container to be used.

Under rare circumstances, volume of specimen is so small that transferring it to another container would result in loss of a usable specimen. Only under such circumstances will a specimen submitted in a syringe be accepted. **The specimen will not be accepted, however, if there is a needle attached to the syringe.** Please remove needle and recap specimen before submitting it for testing.

Urine-24 Hour or Timed

The accuracy of a timed urine specimen depends upon proper collection and preservation. Patient's **must** be carefully instructed to collect a proper specimen. Specimen should be collected in plastic collection bottle provided by Bellin Health Laboratory. Instruct patient that no alcoholic beverages should be consumed during collection period. Check specific test listings for any unique recommendations. Certain tests require a preservative be added to collection bottle at start of collection. Be certain to warn patient of potentially hazardous preservatives in container.

- **Clinic/Laboratory Instructions:**

- Accurately measure total volume and record that volume. Gently and thoroughly mix entire contents of collection before pouring off an aliquot. If collection has required more than 1 container, all contents must be mixed together in a large container before aliquot is poured off. Pour off aliquot in a Bellin Health Laboratory specimen container and record total volume on both specimen and accompanying request form. Store aliquot in manner indicated in specific test listing.

- **Patient Instructions for Collecting a 24-Hour Urine Specimen (Important-To insure accurate test results, please follow these instructions carefully.)**

- Ask laboratory if you need to refrigerate this bottle during collection period.
- At hour you choose to start collection, urinate into toilet and flush as usual.
- Record starting time and date in space provided.
- For next 24 hours (or other specified time period) collect **all** your urine into bottle. If it is necessary to use additional containers, be sure they are clean and well rinsed. Also be sure they contain preservative found in original container if it is needed for test ordered.
- At end of 24-hour collection period (or other specified time period) be sure to collect a final urine specimen.
- Record ending time and date in space provided.
- Promptly return collection to laboratory.

Urine-Random

A clean-catch or midstream urine collection is preferred. Bellin Health Laboratory recommends a **first-morning** urine specimen be collected if possible. Use a urine collection container provided by our laboratory, or another clean, leak-proof container. Specimens intended for urine culture must be collected using a sterile container. If possible, pour an aliquot into a grey urine culture transport tube for culture and an aliquot into a red/yellow swirl urinalysis transport tube. A urinalysis cannot be performed on specimen in grey urine culture tube, and a culture cannot be performed on red/yellow urinalysis transport tube, so if both a urinalysis and culture is needed 2 specimens should be collected and sent.

Culture Specimens Transport Media

- BBL™ CultureSwab™
 - This is a dual swab culture transport system containing liquid Stuart's media in a sponge at base of container. Return both swabs to BBL™ CultureSwab™ after specimen collection.
 - Uses: Bacterial wound, vaginal, throat, ear, and eye cultures
- BBL™ CultureSwab Plus™
 - This is a dual swab culture transport system containing Amies gel media. Return both swabs to culture tube.
 - Uses: Anaerobic cultures that are not able to be submitted as aspirates
- M5 Multi-Microbe Media
 - This pink medium comes in a conical tube with a red cap. Store refrigerated until use.
 - Uses: Viral cultures, and Ureaplasma/ Mycoplasma culture.

Swab Transport Systems

SwabType	Bacterial (Aerobic)	Bacterial (Anaerobic)	Viral	Urea/ Mycoplasma
BBL™ Culture-Swab™	+			
BBL™ Culture-Swab Plus™		+*		
BBL™ Culture-Swab™ with Aluminum Shaft	+ Nasopharyngeal or Urethral			
Dacron® Dry Swab			+ Place in M5 Media	+ Place in M5 Media
Small Rayon-Tipped Swab			+ Place in M5 Media, Nasopharyngeal, or Urethral	+ Place in M5 Media, Nasopharyngeal, or Urethral
* Aspirates are specimen of choice for anaerobic culture. They should be submitted in a tightly-capped syringe (needle removed).				