Specimen Processing

Audience

All personnel responsible for collecting and transporting specimens to UTMB laboratories.

Purpose

To provide instructions for optimal processing of specimens for laboratory testing.

Policy

Proper processing of laboratory specimens is essential for accurate analytical determination of laboratory tests. Incorrectly processed specimens may lead to preanalytical errors and affect test results. The following guidelines address the processing of blood specimens.

Complete specimen handling requirements are provided in the alphabetical test listing of the Laboratory Survival Guide (LSG), accessible to all clients via the UTMB homepage. The LSG provides information on patient preparation, specimen type, specimen labeling, preservation, minimum volume, storage temperature, conditions for transportation and any special handling notes.

Definition

Serum Separator Tubes (SST)

Serum separator, or gel-barrier, tubes contain an inert gel material with a controlled viscosity and specific gravity intermediate to that of serum and clot. In addition, a clotting activator is contained within the tube. The tube walls and closure are treated to eliminate cell- or clot- hang up on the interior surfaces. One benefit of gel barrier tubes is that the serum is not required to be removed from the cells following centrifugation. This eliminates the need to remove the cap prior to testing.

Procedure

1. Draw a sufficient volume of whole blood into the collection tube. **If collected in a SST (gold/ green), gently invert the tube 5-10 times to mix the specimen with the additive.**
2. Place the collection tube(s) in an upright position and allow to stand at room temperature for a minimum of 30 minutes (or sooner if firm clot is visibly noted) to clot. If clotting does not occur within 60 minutes, notify the ordering provider. Do not remove the stopper.
3. After formation of the clot, insert tube(s) into the centrifuge, stopper end up. Operate the centrifuge at 1300Xg for 15 minutes for fixed-angle units or 10 minutes for swing-head units.

   Relative centrifugal force (RCF), or G-force, is a more

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meaningful term than revolutions per minute (RPM). Centrifuge speed requirements are recommended in terms of RCF instead of RPM as centrifuge models and sizes vary considerably.

$$RCF = 1.118 \times 10^{-5} \times r \times n^2$$

where: r = rotating radius
n = speed of rotation (RPM)

Prolonged centrifugation may cause hemolysis unless specified for a specific analyte. A centrifuge temperature of 20 - 22° C is recommended. Specimens should not be centrifuged more than once, as this will introduce error due to change in the water to cell volume ratio.

4. Allow the centrifuge to come to a complete stop. Remove the tubes carefully without disturbing the contents. Inspect the serum for any hemolysis and turbidity by holding it against the light.

   When using serum separator tube (SST):
   Inspect the gel barrier to ensure that it has formed a solid seal between the serum and packed cells.

   When using non-additive (red top) tube:
   Remove the stopper and carefully aspirate serum from the packed cells by placing the tip of a pipette against the side of the tube and inserting it into the serum (approximately ¼ inch above the packed cell layer). Be cautious not to disrupt the packed cell layer. Use a separate disposable pipette for each tube. Transfer the serum into an appropriately labeled transport tube (refer to SMP 1.02).

Please refer to the Laboratory Survival Guide or contact Client Services at 409-747-2900 or 800-522-2266 concerning any questions pertaining to specimen processing.

Reference

H18-A3, Procedures for the Handling and Processing of Blood Specimens; Approved Guideline – Third Edition, NCCLS, 2004.

SMP 1.02 Specimen Labeling

Laboratory Survival Guide

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DIVISION OF SAMPLE MANAGEMENT PATHOLOGY CLINICAL SERVICES

Section 1	**Sample Management Procedures**	09/01/12 -Effective
Subject	**Client Specimen Collection and Processing**	
Topic 1.03	**Specimen Processing**	

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