Tech Talk

Volume 2, No. 1 January 2003

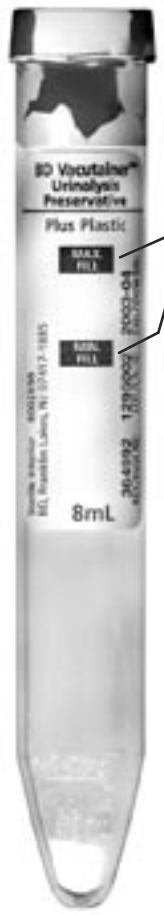
Authors: Lorraine Tyndall, Shrita Smith

The BD Technical Services Department receives many questions about our products. To address these questions we have developed a news bulletin called "Tech Talk" to be sent out periodically.

Tips for Urine Analysis

Q: **We cannot guarantee that urine samples are always the necessary required volume, kept refrigerated, and processed within 2 hours of collection. Is there any alternative?**

A: **A majority of urine specimens are collected either in physicians' offices or at hospitals. Throughout the past decade, testing practices have changed rapidly and an increasing number of specimens are transported to remote or core laboratories. The laboratories are faced with transport effects on the specimens. BD recommends collecting urine specimens in the BD Vacutainer™ Plus Plastic Conical Urinalysis Preservative Tube because specimen integrity is maintained for up to 72 hours without refrigeration.**



Max/Min Fill Line

- Fill lines help the healthcare worker maintain the correct urine-to-additive ratio
- Max fill is 8mL
- Min fill is 7mL

Instructions for Use:

- Place the filled collection cup upright on a clean, flat surface. Note: If a very small urine volume is obtained, the sample may be insufficient to fill the BD Vacutainer Plus Plastic Conical Urinalysis Preservative Tube to the minimum level as indicated on the tube label and may be insufficient for testing.
- The BD Vacutainer Plus Plastic Conical Urinalysis Preservative Tube has an 8mL fill volume.
- When using an Integral Sampling Device or Transfer Straw, allow the vacuum to **completely** fill the tube to 8mL with urine and thoroughly mix 8 to 10 times. If there is very little urine volume collected, the stopper of the preservative tube may be removed and the urine poured from the specimen container into the tube to the minimum mark.
- The MINIMUM amount of urine needed in the tube is 7mL. (See Min Fill Line on Tube) At this volume, the correct urine-to-additive ratio is maintained. If this volume requirement cannot be met, then please follow the NCCLS guideline stated on the following page.
- The conical bottom of the BD Vacutainer Plus Plastic Conical Urinalysis Preservative Tube aids in sediment collection for microscopic analysis. It can be used with the KOVA® pipette system, therefore maintaining a 12:1 urine-to-sediment ratio.
- The urine preservative is comprised of Chlorhexidine, Ethyl Paraben, and Sodium Propionate.

continued on reverse side

In the event that a urine preservative system is not used, NCCLS recommends that the urinalysis testing be performed within 2 hours of specimen collection. If testing cannot be performed within this timeframe, refrigeration (2 to 8° C) is adequate for some chemical components (exceptions being bilirubin and urobilinogen). At these storage temperatures, the specimen can precipitate amorphous urates or phosphates, which obscure the microscopic field. The length of time refrigeration can serve as a preservative has not been determined .[1]

NCCLS[1] also recommends, "If 'urine preservation' systems are used, they should first be evaluated by the laboratory."

It is generally accepted that after standing 2 hours at room temperature, the chemical composition of unprocessed urine changes, and formed elements begin to deteriorate.

The following are changes that may occur:

- pH ↑ - bacteria converts urea to ammonia, CO_2 lost
- pH ↓ - bacteria and yeast convert glucose to acids and alcohols
- Glucose ↓ - utilization by bacteria (glycolysis)
- Ketones can ↓ - caused by volatilization of acetone
- Bilirubin ↓ - destroyed by light, oxidized to biliverdin
- Urobilinogen ↓ - destroyed by light
- Nitrites ↑ - bacterial reduction of nitrate
- Nitrites ↓ - nitrite converted to nitrogen, which evaporates
- Turbidity ↑ - due to bacterial growth, crystal formation, precipitation of amorphous material
- Bacteriuria ↑ - multiplication of bacteria
- Cells and casts disintegrate in dilute urine (SG < 1.010) and urine that becomes alkaline upon standing (pH > 7.0)

BD performed evaluations of the BD Vacutainer Plus Plastic Conical Urinalysis Preservative Tube stored at room temperature (RT). The tube was compared to the BD Vacutainer™ Plus Plastic Conical Tube (RT) at initial time and at 72 hours after tube fill for urine dipstick chemistries. The preservative tube demonstrated some urine analyte results outside the normal reference ranges. Statistical analysis for urine dipstick chemistries showed that over 72 hours there were no clinically significant differences observed between the BD Vacutainer Plus Plastic Control Tube at RT and the BD Vacutainer Plus Plastic Conical Urinalysis Preservative Tube. (VS5771, VS5930).

References:

1. NCCLS – *Urinalysis and Collection, Transportation, and Preservation of Urine Specimens; Approved Guideline* – Second Edition, GP16-A2 Vol. 21 No 19 (2001).
2. Brelwick, Linda L. *Urinalysis in the POL.* Advance for Medical Laboratory Professionals, August 14, 2000.
3. Henry, JB. (ed.) Clinical Diagnosis and Management by Laboratory Methods. Twentieth edition, W.B. Saunders Company 2001.

Please call BD Vacutainer Technical Services for clinical support material.

BD Vacutainer Technical Services: 1.800.631.0174
BD Customer Service: 1.888.237.2762

BD Vacutainer Systems
Preanalytical Solutions
1 Becton Drive
Franklin Lakes, NJ 07417
www.bd.com/vacutainer

Printed in USA 01/03 VS 7055