Volume 6, No. 2 December 2008

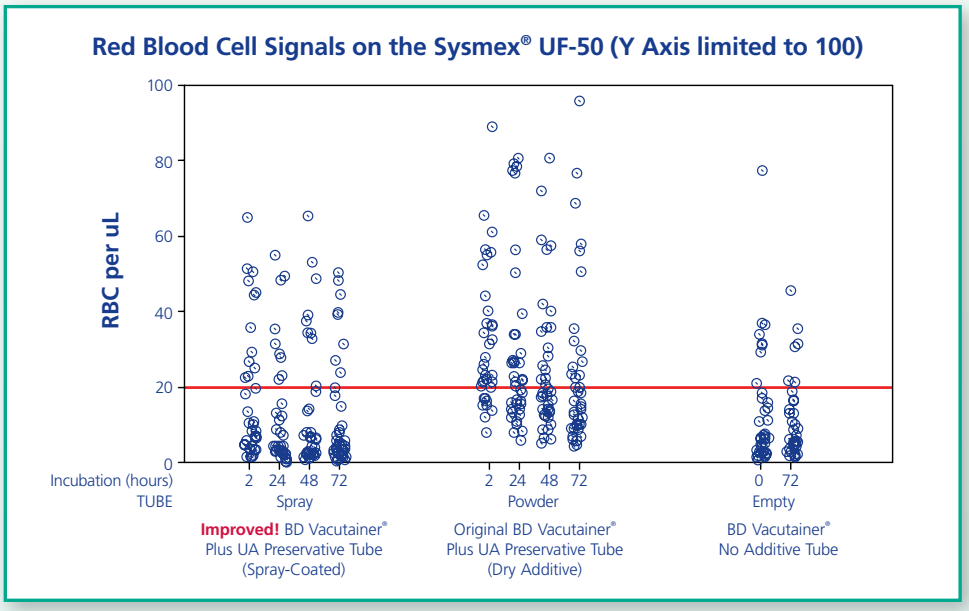
Tech Talk®

The BD Technical Services Department receives many questions about its products. To address these questions, we have developed a periodic news bulletin, called "Tech Talk®."

Tips for Urine Analysis:

Q. Our urine samples cannot always be processed within 2 hours, and we have been told that the BD Vacutainer® Plus UA Preservative Tube will give us false positives for red blood cells with our automated microscopy instrument and perhaps high proteins using both manual and automated dipstick chemistry methods. Is there any alternative?

A. BD Vacutainer® Plus UA Preservative Tube has been improved to reduce the issues with false positive red blood cells and falsely elevated proteins. The new spray coated additive has been clinically tested with Siemens Clinitek® Atlas®, Iris® iQ200 and Sysmex® UF-50 instruments.[1] BD recommends collecting urine specimens in the BD Vacutainer® Plus UA Preservative Tube because specimen integrity is maintained for up to 72 hours without refrigeration.



• **Results of Improved! BD Vacutainer® Plus UA Preservative Tube[1]**

Improvements were also made to reduce the occurrence of high proteins on certain automated and manual urinalysis dipstick methods. However, underfilling the tube to less than 7 mL (the minimum fill volume) may still result in a falsely elevated protein reading.

CLSI recommends that urinalysis testing should be performed within two hours of collection. If testing is delayed, refrigeration is adequate for some chemical components (exceptions are bilirubin and urobilinogen), but it can precipitate amorphous urates or

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phosphates, which obscure the microscopic field. If the urine is also to be cultured, it should be refrigerated during transit and held refrigerated until cultured. For multiple analyses, aliquots of the well-mixed urine may be treated differently, depending on use. There is no agreed-upon length of time for refrigeration as a preservative, because this depends on the individual urine constituents.

CLSI also recommends that, if commercially available "urine preservation" systems are used, they should first be evaluated by the laboratory.

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

The following are changes that may occur:[2]

- 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 (Specific Gravity < 1.010) and urine that becomes alkaline upon standing (pH > 7.0)

Instructions for Use:

1. It is important for the urine to get into the preserved tube as quickly after collection as possible.
2. Place the filled BD Vacutainer® Urine Collection Cup with Integrated Transfer Device upright on a clean, flat surface. If using a standard cup, use a BD Vacutainer® Transfer Straw to transfer the urine specimen into the tube. Allow the vacuum to completely fill the tube to 8 mL.
3. The BD Vacutainer® Plus UA Preservative Tube has a minimum fill volume of 7 mL and a maximum fill volume of 8 mL.
4. When collecting from a Foley catheter, use the BD Vacutainer® Luer-Lok™ Access Device to collect directly into the tube.
5. Immediately after filling, mix the tube by 8 – 10 complete inversions.
6. The conical bottom of the BD Vacutainer® Plus UA Preservative Tube aids in sediment collection for microscopic analysis. It maintains the 12:1 urine to sediment ratio and can therefore be used with the KOVA® pipette system.

Please call BD Global Technical Services for clinical support material.

BD Global Technical Services: 1.800.631.0174
BD Customer Service: 1.888.237.2762

References

[1] VS7613 - A Comparative Evaluation of Spray Coated Urinalysis Preservative Tubes with Current BD Vacutainer® Plus Urinalysis Preservative Tubes for Routine Urinalysis Testing on the Sysmex® UF-50 and Siemens Clinitek® Atlas® Systems

[2] NCCLS. Urinalysis and Collection, Transportation, and Preservation of Urine Specimens; Approved Guide line—Second Edition. NCCLS document GP16-A2 [ISBN 1-56238-448-1]. Clinical & Laboratory Standards Institute (CLSI, formerly NCCLS), 940 West Valley Road, Suite 1400, Wayne, Pennsylvania 19087-1898 USA, 2001 www.clsi.org

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