

# LabNotes

Volume 14, No.2 2004

 A Newsletter from  
BD Diagnostics –  
Preanalytical Systems


## IN THIS ISSUE

**FEATURE:**  
**The Basics of Specimen  
Collection and  
Handling of Urine  
Testing** (Part 1)

— 2 —  
**From the Editor**

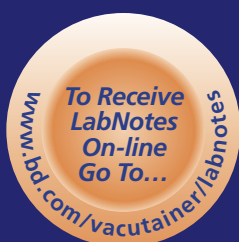
— 3 —  
**Tool Kit**  
BD Vacutainer®  
Luer-Lok™  
Access Device

— 4 —  
**Best Practice**  
Lead Testing

— 5 —  
**Related Industry  
Website**  
What is AACCC?

— 6 —  
**Did You Know**  
NCCLS Updates

— 7 —  
**Order of Draw**  
**Clinical Lab  
Scholarships Program  
2004**



## The Basics of Specimen Collection and Handling of Urine Testing

The First in a Two-Part Series  
*Catherine Skobe, MT (ASCP)*

Urine has a long, rich history as a source for measuring health and well-being and remains an important tool for clinical diagnosis. The clinical information obtained from a urine specimen is influenced by the collection method, timing and handling. A vast assortment of collection and transport containers for urine specimens are available. Determining which urine collection method and container should be used depends on the type of laboratory test ordered.

### Types of Collection

Laboratory urine specimens are classified by the type of collection conducted or by the collection procedure used to obtain the specimen.

**Random Specimen** This is the specimen most commonly sent to the laboratory for analysis, primarily because it is the easiest to obtain and is readily available. This specimen is usually submitted for urinalysis and microscopic analysis, although it is not the specimen of choice for either of these tests. Random specimens can sometimes give an inaccurate view of a patient's health if the specimen is too diluted and analyte values are artificially lowered. Pediatric specimens, which routinely undergo chemistry and microscopic analysis, are generally of this type. As the name implies, the random specimen can be collected at any time. Although there are no specific guidelines for how the collection should be conducted, avoiding the introduction of contaminants into the specimen is recommended. This requires explicit instructions to patients so that they do not touch the inside of the cup or cup lid.

**First Morning Specimen** This is the specimen of choice for urinalysis and microscopic analysis, since the urine is generally more concentrated (due to the length of time the urine is allowed to remain in the bladder) and, therefore, contains relatively higher levels of cellular elements and analytes such as protein, if present. Also called an 8-hour specimen, the first morning specimen is collected when the patient first wakes up in the morning, having emptied the bladder before going to sleep. Since the urine can be collected over any eight-hour period, collection is practical



*continued on page 2*

# LabNotes



## From The Editor

Our feature article in this issue of LabNotes highlights a very important, though sometimes overlooked, specimen in the clinical laboratory — urine. This first in a two part series of articles includes a discussion on the various types of urine specimens that can be collected and analyzed in the clinical lab. It also points out the importance of proper specimen collection in order to avoid introducing preanalytical errors into urine testing. The second part of our series, to appear in a future LabNotes issue, will give further details on urine analysis in the clinical laboratory.

NCCLS has made several changes to some of the guidelines that you may currently be using in your laboratory. In this issue of LabNotes, we have pointed out some of the documents that have been updated to ensure that you have the latest version in your facility.

We hope you enjoy this issue of LabNotes. As always, we look forward to your comments and suggestions.

Jeffrey B. Lawrence, MD, FASCP  
Editor, LabNotes

**Associate Editor**, Leslie S. Magee, MBA, MT(ASCP)  
**Editorial Contributor**, Vera Bitcon, MS, MT(ASCP)  
**Production Coordinator**, Marion Plumley

Address all correspondence to: Leslie Magee, Associate Editor, LabNotes,  
**BD Diagnostics**—Preanalytical Systems, 1 Becton Drive MC325,  
Franklin Lakes, NJ 07417-1885.

## The Vactainer® Brand and Trademark

A trademark is any word (Poison), name (Giorgio Armani), symbol or device (Pillsbury Doughboy), slogan (Got Milk?), package design (Coca-Cola bottle) or combination of these that serves to identify and distinguish a specific product from others in the marketplace or in trade.

Source: International Trademark Association, New York, NY [www.inta.org](http://www.inta.org)

Trademarks were developed to protect the consumer from confusion as to the source of products and services available in the marketplace. Trademarks identify and distinguish the source of goods or services of one party from those of another. Trademarks, otherwise known as brands, are intellectual property and are part of the assets or “good will” of a company.

On LabNotes, and many other pieces of information you receive from BD and on our website, you see the Vacutainer® Brand represented with the registered trademark symbol ®. Vacutainer is a registered trademark of Becton, Dickinson and Company. This brand name is officially registered with the US Trademark authority and other local trade authorities worldwide, and is legally owned by BD.

*continued from page 1*

for patients who have atypical work/sleep schedules. Proper collection practices and accurate recording of the collection time are important criteria of a first morning specimen. Note: Any urine that is voided from the bladder during the eight-hour collection period should be pooled and refrigerated, so that a true 8-hour specimen is obtained.

## Midstream Clean Catch Specimen

This is the preferred type of specimen for culture and sensitivity testing because of the reduced incidence of cellular and microbial contamination. Patients are required to first cleanse the urethral area with a castile soap towelette. The patient should then void the first portion of the urine stream into the toilet. These first steps significantly reduce the opportunities for contaminants to enter into the urine stream. The urine midstream is then collected into a clean container (any excess urine should be voided into the toilet). This method of collection can be conducted at any time of day or night.

**Timed Collection Specimen** Among the most commonly performed tests requiring timed specimens are those measuring creatinine, urine urea nitrogen, glucose, sodium, potassium, or analytes such as catecholamines and 17-hydroxysteroids that are affected by diurnal variations.

A timed specimen is collected to measure the concentration of these substances in urine over a specified length of time, usually 8 or 24



hours. In this collection method, the bladder is emptied prior to beginning the timed collection. Then, for the duration of the designated time period, all urine is collected and pooled into a collection container, with the final collection taking place at the very end of that period. The specimen should be refrigerated during the collection period, unless otherwise requested by the physician. Accurate timing is critical to the calculations that are conducted to determine analyte concentrations and ratios. Interpretations based on faulty calculations can result in improper diagnoses or medical treatment.

*continued on page 3*

# TOOL KIT: BD Vacutainer® Luer-Lok™ Access Device

Accidental exposure to bloodborne pathogens is a concern of all healthcare workers. EPINet1999 data from 21 hospitals document 1,996 needlestick and sharps objects injuries. Nurses, nursing students and IV teams accounted for 45% (885) of all reported injuries.<sup>1</sup> Recognizing this situation, BD continues to lead the world in providing safety-engineered medical devices that can help reduce the risk of accidental needlesticks.

The **BD Vacutainer® Luer-Lok™ Access Device** was designed to replace traditional needle/syringe specimen collection with a luer lock device that fits into an IV port and allows specimens to be collected into an evacuated tube.

## BD Vacutainer® Luer-Lok™ Access Device:

- Is compatible with female luer connections or IV ports designed for luer access
- Has **blue** color-coded threads to provide easy differentiation from other holder-based products
- Provides the security of a threaded locking luer connection (patented BD Luer-Lok™), replacing luer slip devices
- Is also compatible with luer-activated ports for closed, direct urine sampling that may be found in some foley catheters (such as the Bard® E-Z™ Lock Sampling Port)



Reference #364902



<sup>1</sup> EPINet – Exposure Prevention Information Network. "Uniform Needlestick and Sharp Object Injury Report (of) 21 Hospitals." Charlottesville, VA: Health Care Worker Safety Center at the University of Virginia (1999) 1-6. (On-Line) [med.virginia.edu/medcntr/centers/epinet/soi99](http://med.virginia.edu/medcntr/centers/epinet/soi99).

*continued from page 2*

**Catheter Collection Specimen** This assisted procedure is conducted when a patient is bedridden or cannot urinate independently. The healthcare provider inserts a foley catheter into the bladder through the urethra to collect the urine specimen. (Specimens may also be collected through an existing foley catheter.) Specimens may be collected directly from a foley into an evacuated tube or transferred from a syringe into a tube or cup.

**Suprapubic Aspiration Specimen** This method is used when a bedridden patient cannot be catheterized or a sterile specimen is required. The urine specimen is collected by needle aspiration through the abdominal wall into the bladder.

**Pediatric Specimen** For infants and small children, a special urine collection bag is adhered to the skin surrounding the urethral area. Once the collection is completed, the urine is poured into a collection cup or transferred directly into an evacuated tube with a transfer straw. Urine collected from a diaper is not recommended for laboratory testing since contamination from the diaper material may affect test results.

## Urine Collection Products

There are many different manufacturers of urine collection containers. Information on a specific product's uses, features and claims should be obtained from that device's manufacturer.

### Urine Collection Containers (cups for collection and transport)



Urine collection container cups come in a variety of shapes and sizes with lids that are either snap on or screw on. To protect healthcare personnel

from exposure to the specimen and protect the specimen from exposure to contaminants, leak-resistant cups should be utilized. Some urine transport cup closures have special access ports that allow closed-system transfer of urine directly from the collection device to the tube.

### Urine Collection Containers (24-hour collection)

Urine collection containers for 24-hour specimens come in a variety of shapes and colors, but most are of 3 liter (L) capacity<sup>1</sup> and are amber colored (to protect light-sensitive analytes such as porphyrins and urobilinogen). Closure types vary and some have a port for ease of specimen

transfer into a tube. When a preservative is required, it should be added to the collection container before the urine collection begins and warning labels should be placed on the container. If there is more than one acceptable preservative for the analyte being tested, the least hazardous one should be selected. A corresponding Material Safety Data Sheet (MSDS) should be given to the patient, and the healthcare provider should explain any potential hazards. Some common 24-hour preservatives are hydrochloric acid, boric acid, acetic acid and toluene.

**Urinalysis Tubes** Urine specimens are poured directly into urinalysis tubes with screw- or snap-on caps. Additionally, there are evacuated tubes similar to those used in blood collection that are filled by using a straw device, from cups with integrated transfer devices built into their lid, or from direct sampling devices that are used to access catheter sampling ports. Urinalysis tubes come in an array of tube shapes: conical bottom, round bottom, or flat bottom. Conical bottom tubes provide the best sediment collection for microscopic analysis. Some tubes are specially designed to be used with a pipet-

*continued on page 4*

continued from page 3

ter that allows for standardized sampling. The tubes you select should be able to withstand centrifugation and, if used with an automated instrument system, should be compatible with the corresponding racks and carriers. Fill volumes of urinalysis tubes usually range from 8 to 15 mL.

**Preservatives for Urinalysis** NCCLS Guidelines recommend testing urine within two hours of its collection. However, refrigeration or chemical preservation of urine specimens may be utilized if testing or refrigeration within a two-hour window is not possible. A variety of urine preservatives (tartaric and boric acids being the most common) are available that allow urine to be kept at room temperature while still providing results comparable to those of refrigerated urine. Generally, the length of preservation capacity ranges from 24 to 72 hours. Claims for the length of specific analyte preservation should be obtained from the manufacturer. When a specimen is directly transferred from a collection cup into a preservative tube, it provides a stable environment for the specimen until testing can be conducted and reduces the risk of bacterial overgrowth or specimen decomposition. Non-additive tubes (those not containing any chemical preservatives) can be used for urinalysis, but must be handled following strict timing and refrigeration guidelines.

**Preservatives for Culture and Sensitivity (C&S) Testing** The most common preservative used for culture and sensitivity is boric acid, which comes in tablet, powder or lyophilized form.

There is clinical evidence to suggest that non-buffered boric acid may be harmful to certain organisms and that buffered boric acid preservatives can reduce the harmful effects of the preservative on the organisms.<sup>2</sup> C&S preservatives are designed to maintain the specimen in a state equivalent to refrigeration by deterring the proliferation of organisms that could result in a false positive culture or bacterial overgrowth. Preserved urine specimens can be stored at room temperature until time of testing. Product claims regarding duration of preservative potency should be obtained from the particular manufacturer.

continued on page 5

## BEST PRACTICE: Lead Testing



**Q:** Which blood collection tubes can be used for lead testing, particularly on pediatric patients?

**A:** BD offers two different types of tubes for lead testing. Both have been FDA cleared for use in lead determinations and are certified to be of low lead content (thereby minimizing the risk of false positive lead results).

• **BD Microtainer® K<sub>2</sub>EDTA Tube with BD Microgard™ Closure (Ref #365974)**



This tube is used for capillary collections from skin punctures such as heelsticks on infants or fingersticks on small children. It holds between 250 and 500 µl of blood. The amount of lead in this tube is certified to be less than one nanogram.

The following BD white papers offer supporting clinical documentation for this tube:

- ▶ VS5343–BD Microtainer® K<sub>2</sub>EDTA Tubes Catalog #365974: Evaluation of Lead Using Graphite Furnace Atomic Absorption Spectrophotometry (GFAAS).
- ▶ VS5344–BD Microtainer® K<sub>2</sub>EDTA Tubes Catalog #365974: Evaluation of Lead Using Anodic Stripping Voltometry (ASV).

Both of these studies show that the BD Microtainer® K<sub>2</sub>EDTA Tube, Ref. #365974 is an acceptable capillary blood collection device that ensures accurate and precise results for lead analysis by both GFAAS and ASV methods.

The original style of BD Microtainer® Tube with K<sub>2</sub>EDTA (Ref #365973) is not certified to be low lead.

• **BD Vacutainer® K<sub>2</sub>EDTA Plus Plastic Tube (Ref # 367855)**



This tube draws 3mL of venous blood and is ideal for pediatric venipunctures. It is also certified for low lead content, with a background lead amount of 2.5ppb (parts per billion) or 0.25µg/dL. The concentration of EDTA in the tube is 1.8 mg/mL of blood, which is consistent with all other BD Vacutainer® EDTA Tubes.

The Centers for Disease Control (CDC) reports that the principal sources of lead exposure for children in the United States are house dust contaminated by leaded paint and soil contaminated by both leaded paint and decades of industrial and motor vehicle emissions.<sup>1</sup>

Exposure to lead can damage the nervous, hematopoietic and renal systems. Extremely high blood lead levels (>70 ug/dL) can potentially cause seizures, coma and even death.<sup>1</sup>

Children between the ages of 12-36 months are most vulnerable to lead poisoning because<sup>2</sup>:

- They ingest more lead due to hand-to-mouth transfer
- Their gastrointestinal tracts absorb more lead than adults
- Their developing central nervous systems are more sensitive to the effects of lead poisoning

<sup>1</sup> Meyers, P.A., et al. "Surveillance for Elevated Blood Lead Levels Among Children - US, 1997-2001". CDC MMWR™, September 12, 2003.

<sup>2</sup> The Screening Policy and Guidance for Preventing Childhood Lead Poisoning in Arizona. www.hs.state.az.us

continued from page 4

## Specimen Collection and Transport Guidelines

As with any type of laboratory specimen, there are certain criteria that need to be met for proper collection and transportation of urine specimens. This will ensure proper stability of the specimen and more accurate test results.

- All urine collection and/or transport containers should be clean and free of particles or interfering substances.
- The collection and/or transport container should have a secure lid and be leak-resistant. Leak-resistant containers reduce specimen loss and healthcare worker exposure to the specimen while also protecting the specimen from contaminants.
- It is good practice to use containers that are made of break-resistant plastic, which is safer than glass.
- The container material should not leach interfering substances into the specimen.
- Specimen containers should not be reused.
- The NCCLS guidelines for urine, GP-16A2, recommend the use of a primary collection container that holds at least 50 mL, has a wide base and an opening of at least 4 cm.<sup>1</sup> The wide base prevents spillage and a 4 cm opening is an adequate target for urine collection. The 24-hour containers should hold up to 3L.<sup>1</sup>
- The NCCLS guidelines recommend sterile collection containers for microbiology specimens.<sup>1</sup> The containers should have secure closures to prevent specimen loss and to protect the specimen from contaminants.
- Transport tubes should be compatible with automated systems and instruments used by the lab.
- Collection containers and/or transport tubes should be compatible with the pneumatic tube system if one is used for urine specimen transport in the facility. A leak-proof device in this situation is critical.
- NCCLS recommends the use of an amber colored container for specimens being assayed for light sensitive analytes, such as urobilinogen and porphyrins.<sup>1</sup> The colorant prevents the degradation of certain analytes.

- Proper labeling should be applied to the collection container or tubes.

## Specimen Preservation Guidelines

- NCCLS guidelines for microbiological urine testing recommend the use of chemical preservatives if the specimen cannot be processed within 2 hours of collection. Otherwise, these specimens

should be refrigerated at 2-8°C.<sup>1</sup> For urinalysis, NCCLS recommends the evaluation of urine preservation systems by the laboratory before being utilized in the facility.<sup>1</sup>

- The proper specimen-to-additive ratio must be maintained when using a chemical preservative to ensure accurate

continued on page 6

## RELATED INDUSTRY WEBSITE:

# What is AACC?

[www.aacc.org](http://www.aacc.org)

The **American Association for Clinical Chemistry, Inc. (AACC)** is an international scientific/medical society of clinical laboratory professionals, physicians, research scientists and other individuals involved in clinical chemistry and other clinical laboratory science-related disciplines. Founded in 1948, the society has 10,000 members and is headquartered in Washington, D.C.

Clinical chemistry is the use of chemical processes in a clinical laboratory setting to evaluate patient health. It is one of several specialties — such as microbiology, pathology, molecular biology or hematology — practiced in the clinical laboratory. Most AACC members direct laboratories analyze body fluid samples, such as blood or urine, or samples of DNA, to gain information to help physicians diagnose or monitor a patient's state of health or disease or monitor treatment. Increasingly, lab testing is being used to detect predisposition to a disease, or to find a disease presymptomatically so treatment can begin much earlier.

AACC members come from a variety of employment settings: hospital laboratories 50%; industry, 26%; and independent laboratories, 24%. AACC members can be found in more than 100 countries; 30% of membership is from outside of the USA.

### AACC publications include:

- *Clinical Chemistry*, an international journal of laboratory medicine and molecular diagnostics
- *Clinical Laboratory News*, an authoritative source for timely analysis of issues and trends affecting clinical laboratorians
- *Clinical Laboratory Strategies*, a concise monthly newsletter for clinical laboratory directors and managers that provides administrators with news when they need it to help manage their laboratories more effectively

AACC is also the sponsor of the annual AACC Annual Meeting and Clinical Lab Expo, which is the largest dedicated conference and exhibition of equipment, instruments and services for clinical laboratories in the world.

For detailed information about AACC, visit their website at [www.aacc.org](http://www.aacc.org)

The site includes information on:

- About AACC, VSF (The Van Slyke Foundation) and contact information
- Meetings
- Links
- Divisions, Local sections, International area
- Publications
- Education and Career Development

continued from page 5

test results. Maintaining the correct ratio is especially important when transferring samples into a preservative tube. Use the indicated fill lines on the tube to ensure proper fill. Underfilling the tube will leave a high concentration of preservative in the specimen, while overfilling the tube will overly dilute the preservative. In either case, the function of the preservative may be compromised.

- An evacuated tube system is designed to achieve proper fill volume to ensure the proper specimen-to-additive ratio and proper preservative function. Evacuated systems also reduce the potential exposure of the healthcare worker to the specimen.

**The American Hospital Association and the EPA have issued a Memorandum of Understanding for the “virtual elimination of mercury containing waste from the health care industry waste stream” by the year 2005.<sup>3</sup>**

- Chemical preservatives should be non-mercuric and environmentally friendly.
- The EPA cites mercuric oxide used in urinalysis preservatives as a source of mercury in medical laboratories. The American Hospital Association and the EPA have issued a Memorandum of Understanding for the “virtual elimination of mercury containing waste from the health care industry waste stream” by the year 2005.<sup>3</sup> Certain states have already established a zero tolerance mandate for mercury waste generation and improper disposal. The EPA website, <http://www.epa.gov/mercury> offers additional information on mercury that is pertinent to medical environments and safety.

#### Urine Specimen Handling Guidelines

**Labels** Include the patient name and identification on labels. Make sure that the information on the container label and the requisition match. If the collection container is used for transport, the label should be placed on the container and not on the lid, since the lid can be mistakenly placed on a different container. Ensure that the labels used on the containers are adherent under refrigerated conditions.

continued on page 8

## DID YOU KNOW...



NCCLS has recently updated several of its more commonly used documents

The following updated documents have several important changes that you need to be aware of:

### H01-A5 Tubes and Additives for Venous Blood Specimen Collection; Approved Standard – Fifth Edition

*American National Standard\* This standard contains requirements for blood collection tubes and additives, including heparin, EDTA, and sodium citrate.*

### H03-A5 Procedure for the Collection of Diagnostic Blood Specimens by Venipuncture; Approved Standard – Fifth Edition

*This document provides procedures for the collection of diagnostic specimens by venipuncture, including line draws, blood culture collection, and venipuncture in children. It also includes recommendations on order of draw.*

### H21-A4 Collection, Transport, and Processing of Blood Specimens for Testing Plasma-Based Coagulation Assays; Approved Guideline – Fourth Edition

*This document contains procedures for collecting, transporting, and storing blood; processing blood specimens; storing plasma for coagulation testing; and provides general recommendations for performing the tests.*

All the above documents are available for purchase electronically or in hard copy by calling **NCCLS at 1.877.447.1888**, or by visiting their website at **[www.nccls.org](http://www.nccls.org)**

They can also be purchased through the BD Education Center by calling 1.800.255.6334 or at [www.bd.com/education](http://www.bd.com/education).

**The BD Education Center is a comprehensive resource for up-to-date educational materials focusing on a variety of human health topics.**

The above information is published with the permission of NCCLS.

\*American National Standards have been approved by the American National Standards Institute (ANSI). NCCLS submits selected standards as candidate American National Standards when such status will enhance their national or international usefulness.



To print out this latest  
**BD Vacutainer® Order of Draw**  
 wall chart, visit

[www.bd.com/vacutainer/orderofdraw](http://www.bd.com/vacutainer/orderofdraw)

\*Reflects change in NCCLS recommended Order of Draw (NCCLS H3-A5, Vol 23, No 32, 8.10.2)



## From BD Diagnostics—Preamalytical Systems

BD has long recognized the need for the ongoing education of healthcare providers. One of the ways in which we endeavor to meet that need is through our Continuing Education Scholarship Program, which is designed to avail participants of the latest developments in the healthcare field.

Since 2002, the **BD Continuing Education Scholarships Program** has awarded 46 scholarships (inclusive of registration fees, travel, and lodging) to laboratory professionals, enabling them to attend national conferences that may otherwise have been out of practical reach.

In 2004, BD provided an educational grant to CLMA to create the first annual **Lyle Rosser, Jr., Continuing Education Scholarship** at the CLMA/ASCP 2004 Conference in Atlanta. This special scholarship was created to honor the legacy of Lyle Rosser, Jr., long-time CLMA member and champion of education. The eleven scholarship recipients were chosen from 175 candidates who applied by submitting resumes, and letters of recommendation to the CLMA Advisory Committee.

“In the hospital environment with limited budgets, it can be hard to get the chance to attend meetings such as CLMA/ASCP,” said recipient Reyanna Rice, Laboratory Services Coordinator at Community Medical Center in Missoula, MT.

Glenda Bozalina, Laboratory Manager at the South Texas Medical Clinics in Wharton, Texas and scholarship recipient agreed. “It is difficult to attend continuing education courses on site. In order to keep growing and developing, to keep up with the changing technology and trends, I have to stay current. I need to be challenged with new philosophies so I won’t get in the ‘rut.’”



Our 2004 Scholarship Winners, Guest Speaker David Plaut, and BD Vice-President of Marketing Cathy Shea.

BD is proud to sponsor educational opportunities through organizations such as CLMA, that provide continuing education. According to Krista Thompson, Vice President/General Manager of BD Diagnostics, Preamalytical Systems, “Our continuing education scholarship program is one of the many ways BD works to exemplify our purpose of ‘helping all people live healthy lives.’”

continued from page 6

**Volume** Ensure that there is sufficient volume to fill the tubes and/or perform the tests. Underfilling or overfilling containers with preservatives may affect specimen-to-additive ratios.

**Collection Date and Time** Include collection time and date on the specimen label. This will confirm that the collection was done correctly. For timed specimens, verify start and stop times of collection. Document the time at which the specimen was received in the laboratory for verification of proper handling and transport after collection.

**Collection Method** The method of collection should be checked when the specimen is received in the laboratory to ensure the type of specimen submitted meets the needs of the test ordered. An example of an optimum specimen/test match would be a first morning specimen for urinalysis and microscopic examination.

**Proper Preservation** Check if there is a chemical preservative present or if the specimen has not been refrigerated

for greater than two hours post collection. After accepting the test request, ensure that the method of preservation used is appropriate for the selected test. If the correct preservative was not used the test cannot be conducted.

**Light Protection** Verify that specimens submitted for testing of light-sensitive analytes are collected in containers that protect the specimen from light.

This is a glimpse into the complexity of proper urine collection and handling. Since a variety of urine collection procedures and applications exist today, it becomes critical to understand how, when and where things can go wrong. As the trend toward more home-based testing and less invasive methods continues, urine will become one of the most useful specimen types collected for clinical assessment.

References

1. NCCLS GP-16A2, Volume 21, No. 19, Urinalysis and Collection, Transportation, and Preservation of Urine Specimens; Approved Guideline-Second Edition, p. 4-21.
2. Journal of Clinical Microbiology, Oct. 1983, Evaluation of Liquid and Lyophilized Preservatives for Urine Culture, p.912-916.
3. Memorandum of Understanding Between the United States Environmental Protection Agency and the American Hospital Association, Created July 30, 1998, Sec. 3.2.

BD has received  
**FDA 510(k) clearance**  
on  
BD Vacutainer®  
Plus Plastic Serum Tubes  
for  
**Immunochemistry**

- ABO Grouping
- Red Cell Phenotyping
- Rh Typing
- DAT Testing
- Antibody Screening



# LabNotes

Volume 14, No.2 2004

A Newsletter from  
BD Diagnostics –  
Preanalytical Systems

## IN THIS ISSUE

### The Basics of Specimen Collection and Handling of Urine Testing (Part 1)

#### From The Editor

**Tool Kit:**  
BD Vacutainer® Luer-Lok™ Access Device

**Best Practice:** Lead Testing

**Related Industry Website:**  
What is AACC?

**Did You Know:**  
NCCLS Updates

#### Order of Draw

#### Clinical Lab Scholarships Program 2004

Bard is a registered trademark of C.R. Bard, Inc. or an affiliate.  
EZ-Lok is a trademark of C.R. Bard, Inc. or an affiliate.  
Unless otherwise noted, BD, BD Logo and all other trademarks are the property of Becton, Dickinson and Company. ©2004 BD.  
Printed in USA www.bd.com/vacutainer 8/04 V57226

PRESORTED  
FIRST-CLASS MAIL  
U.S. POSTAGE  
**PAID**  
BD