



WHY NOT  
TREAT URINE  
LIKE BLOOD?



**BD**

Advancing the  
world of health



**Urine testing** is one of the three **most commonly ordered** diagnostic screening tests<sup>1</sup>





**TREAT URINE**

Every **patient**.  
Every **time...**



**LIKE BLOOD.**

because there is a life  
behind **every sample.**





# Critical Issues in Urine Testing

## Far-Reaching Consequences for an Important Test

- Urine testing is one of the three most commonly ordered diagnostic screening tests<sup>1</sup>
  - U.S. hospitals process hundreds of millions of urine samples annually<sup>2</sup>
  - Failure to preserve samples jeopardizes sample quality and is out of compliance with CAP Guidelines
- Poor specimen quality may lead to erroneous results that significantly impact patient results
  - Leakage and spills associated with open systems pose significant financial, clinical, and safety issues



## Clinical Indications for Urine Testing

<b>Disease State</b>	<b>U.S. Prevalence/Incidence</b>
<b>Diabetes<sup>3</sup></b>	23.6 million <sup>4</sup>
<b>Chronic kidney disease<sup>5</sup></b>	26 million <sup>6</sup>
<b>Acute pyelonephritis<sup>7</sup></b>	100,000 hospitalizations/year <sup>7</sup>
<b>Uncomplicated UTI<sup>7,8</sup></b>	8 million <sup>7</sup> ; 479,000 hospitalizations/year <sup>9</sup>
<b>Catheter-associated UTI<sup>10</sup></b>	>1 million/year <sup>11</sup>

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**45%** of outpatient samples re-collected are not reimbursed<sup>16</sup>

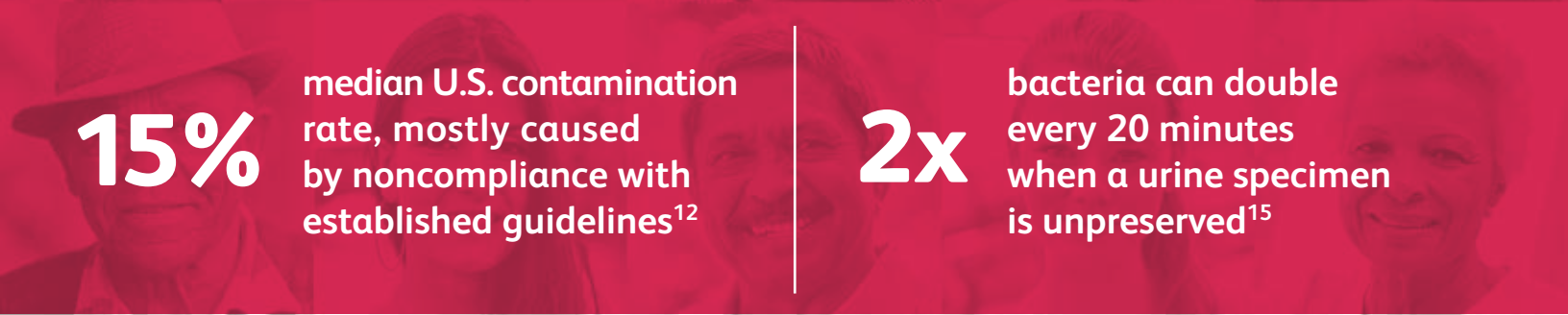


**15%**

median U.S. contamination rate, mostly caused by noncompliance with established guidelines<sup>12</sup>

**2x**

bacteria can double every 20 minutes when a urine specimen is unpreserved<sup>15</sup>



# Specimen Contamination, Deterioration, and Overgrowth are Widespread

CLSI and WHO Urinalysis Guidelines stipulate that urine samples be:<sup>13,14</sup>

- Processed by the lab within 2 hours of collection and kept refrigerated
- Or, immediately preserved using a specifically designed chemical preservative

Unpreserved samples run the risk of contamination and/or overgrowth, which may lead to:

- Slower reporting of results
- Re-collection, relabeling, and retesting
- Unnecessary treatment such as antibiotics
- Financial inefficiencies

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# 78%

of leaked samples are re-collected, delaying results and increasing costs<sup>16</sup>



## Leakage and Spills Disrupt Workflow

### Leaks and Pour Off Rates are a Major Concern

- Pour offs are common practice<sup>16</sup>
- Spills and leaks are widespread<sup>16</sup>
- Leakage in pneumatic tubes that cause system shutdown occurs 2 to 5 times per year<sup>16</sup>
- Specimens that leak are discarded, requiring re-collections<sup>16</sup>

# 5%

of all specimens leak in transit to the lab<sup>16</sup>

# 88%

of transit-related leaks are from screw-cap containers in open systems<sup>1</sup>

### Costly Workflow Impact

#### Lab Impact:

- Inefficient workflow with significant time/labor costs

#### Financial Impact:

- Increased labor
- Cost of cleanup







# Instrumentation and Automation Trends

Today's Urinalysis and Microbiology Labs are looking for workflow improvements. Many are turning to semi- or fully automated instruments to improve their workflow.

**?** Why implement automation but not receive an automation-ready specimen for analysis?



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# Limitations of Open Systems Impact Both Results and Costs

## Process Errors Can Lead to Inappropriate or Unnecessary Treatment

- Up to 70% of urine cultures reflect false-positive results and yield no clinically relevant information<sup>17,18</sup>
- Closed system users have 3x greater chance of getting accurate UTI testing results than open system users<sup>16</sup>
- Inability to confirm UTIs leads to prolonged patient stays and unnecessary treatment for nonexistent infections<sup>16</sup>
- Individuals using an antibiotic for UTI may develop resistance<sup>19</sup>

## The Bottom Line Impact of Testing Errors

- Treatment for false positives may not be reimbursed
- Repeated urine cultures can prolong inpatient stays by approximately two days at a typical cost of \$900<sup>16</sup>

# Outcomes of Unconfirmed UTI<sup>16</sup>



**54%**

treated with pathogen-resistant antibiotic



**73%**

had prolonged inpatient stay



**54%**

of outpatients returned for visit



**73%**

were treated for a nonexistent infection

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## BD Can Help.

**BD Life Sciences – Preanalytical Systems** understands the challenges you face surrounding specimen quality, changes in reimbursement, workflow efficiencies, instrumentation and automation.

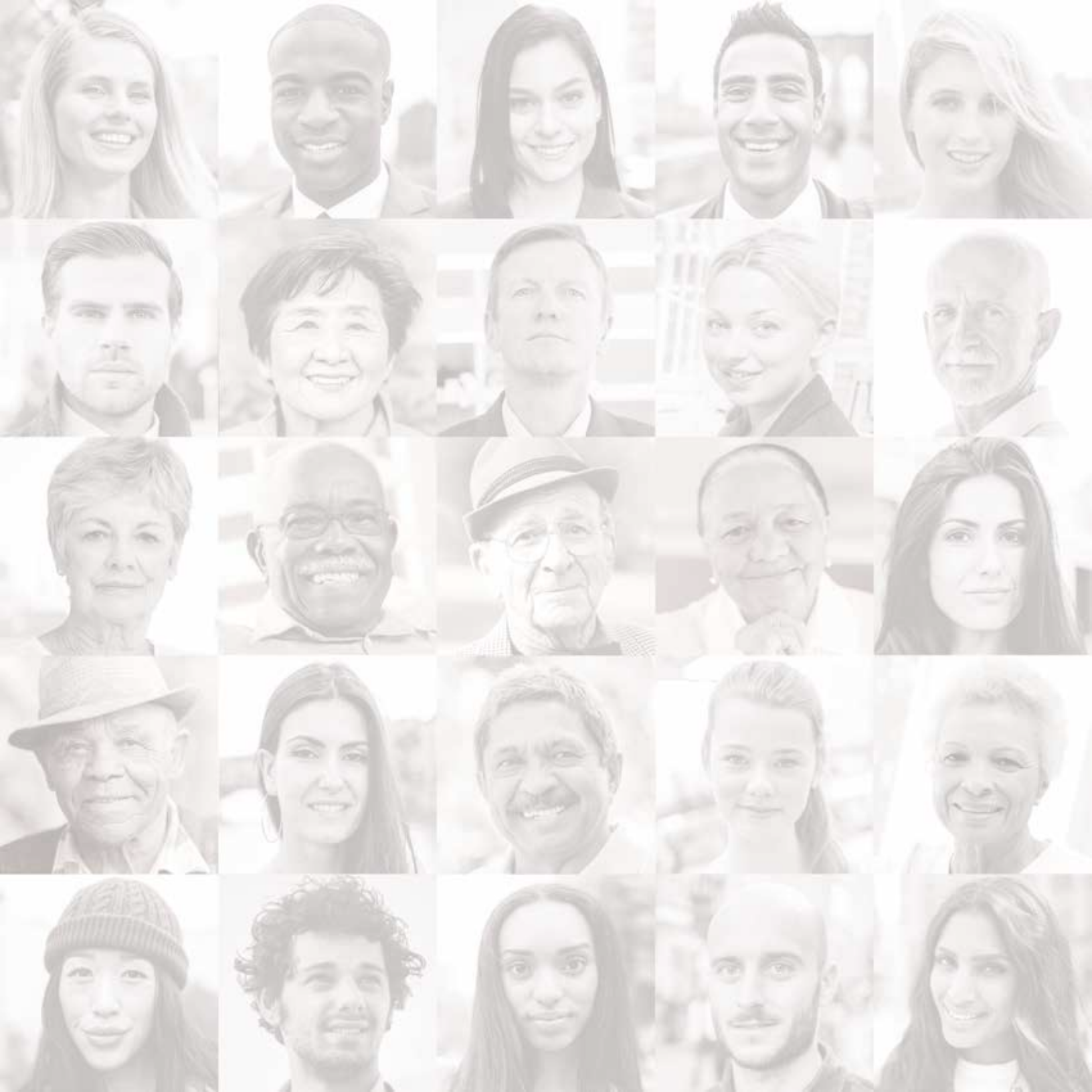
Enhancing the patient experience is our number one concern. With over 60 years of clinical expertise, it's our goal to help you...

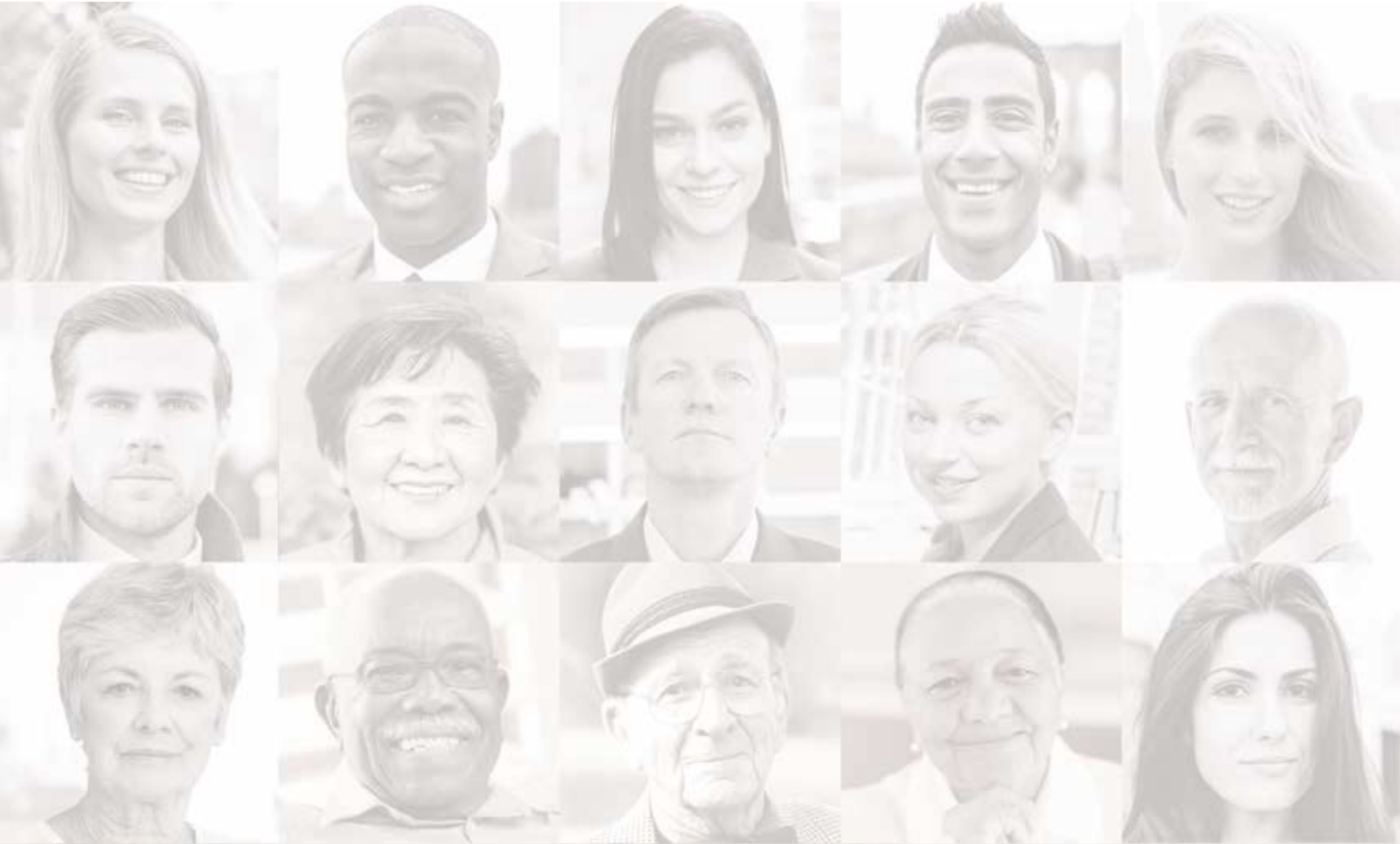
- Improve sample quality
- Ensure specimen readiness for instrumentation and automation
- And, improve your overall workflow and efficiency



# References

1. Stankovic AK, DiLauri E. Quality improvements in the preanalytical phase: Focus on urine specimen workflow. *Clin Lab Med.* 2008;28(2):339-350.
2. Howanitz PJ, Saladino AJ, Dale, JC. Timeliness of urinalysis: A college of American pathologists Q-probes study of 346 small hospitals. *Arch Pathol Lab Med.* 1997;121(7):667-672.
3. American Diabetes Association. Standards of medical care in diabetes—2010. *Diabetes Care.* 2010;33(suppl 1):s11-s61.
4. American Diabetes Association Website. <http://www.diabetes.org/diabetes-basics/diabetes-statistics>. Accessed October 29, 2010.
5. Levey AS, Coresh J, Balk E, et al. National Kidney Foundation practice guidelines for chronic kidney disease: evaluation, classification, and stratification. *Ann Intern Med.* 2003;139(2):137-147.
6. National Kidney Foundation Website. <http://www.kidney.org/kidneydisease/ckd>. Accessed October 29, 2010.
7. Warren JW, Abrutyn E, Hebel R, et al. Guidelines for antimicrobial treatment of uncomplicated acute bacterial cystitis and acute pyelonephritis in women. *Clin Infect Dis.* 1999;29(4):745-758.
8. Mehnert-Kay SA. Diagnosis and management of uncomplicated urinary tract infections. *Am Fam Physician.* 2005;72(3):451-456.
9. National Institute of Diabetes and Digestive and Kidney Diseases Website. <http://kidney.niddk.nih.gov/kudiseases/pubs/kustats>. Accessed October 29, 2010.
10. Hooton TM, Bradley SF, Cardenas DD, et al. Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults: 2009 international clinical practice guidelines from the Infectious Diseases Society of America. *Clin Infect Dis.* 2010;50(5):625-663.
11. Jacobsen SM, Stickler DJ, Mobley HLT, Shirtliff ME. Complicated catheter-associated urinary tract infections due to *Escherichia coli* and *Proteus mirabilis*. *Clin Microbiol Rev.* 2008;21(1):26-59.
12. Bekeris LG, Jones BA, Walsh MK, Wagar, EA. Urine culture contamination: A college of American pathologists Q-probes study of 127 laboratories. *Arch Pathol Lab Med.* 2008;132(6):913-917.
13. CLSI; CLSI GP-16 A3. Urinalysis: Approved Guideline. 3rd Ed., February 2010.
14. Basic Laboratory Procedures in Clinical Bacteriology. 2nd Ed., World Health Organization. 2003.
15. Levinson, W. Growth. In Review of Microbiology and Immunology. 10th ed. San Francisco, CA: McGraw-Hill Companies, Inc; 2008:15.
16. Data on file. Becton, Dickinson and Company: Franklin Lakes, NJ; 2010.
17. Cronin M. Automated urinalysis technology improves efficiency and patient care. *MLO Med Labs Obs.* 2008;40(10):30,32.
18. Simerville JA, Maxted WC, Pahira JJ. Urinalysis: a comprehensive review. *Am Fam Physician.* 2005;71(6):1153-1162.
19. Costelloe C, Metcalfe C, Lovering A, Mant D, Hay AD. Effect of antibiotic prescribing in primary care on antimicrobial resistance in individual patients: Systematic review and meta-analysis. *BMJ.* 2010;340:c2096.





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