



LAB ALERT

THE MEDICAL FOUNDATION

URINALYSIS WITH REFLEX TO CULTURE: Update

Effective Date: June 1, 2016

Performing Department: Automated Lab / Hematology

Patients, in whom the presence of urinary tract infection is uncertain, are often screened by urinalysis to determine if subsequent urine culture is warranted (SBMF No. 25074).

Although the presence of urine WBCs, nitrites, and/or leukocyte esterase support the possibility of urinary tract infection, especially in a symptomatic patient, there are no absolute urinalysis criteria that reliably predict urine culture results. In keeping with evolving practices in comparable laboratories, TMF recently assessed urinalysis parameters that best correlated with the presence or absence of a urinary pathogen on subsequent culture. The study population focused on outpatients and emergency room patients who had orders for urinalysis with reflex to culture if indicated. The urinalyses were automated or semi-automated (not dipstick), with limited confirmation of particles by manual microscopy. The summary of the study is shown in the chart on the reverse page.

Based on the results of this study, the urinalysis parameters prompting reflex to culture have been modified. If Urinalysis, Complete, with Reflex to Culture (SBMF No. 25074) is ordered, any of the following urinalysis results will prompt the reflex urine culture (SBMF No. 21054):

- *WBC > 60/HPF or innumerable*
- *Nitrites positive*
- *Bacteria or yeast present AND WBC >9/HPF*
- *Bacteria or yeast present AND leukocyte esterase small, moderate or large*

Specimens exhibiting these results on urinalysis had approximately a 50% chance of growing significant numbers of a pathogenic organism on reflex urine culture. Specimens that did not exhibit these results on urinalysis had less than a 7% chance of growing significant numbers of a pathogenic organism in culture. These findings are based solely on the submitted urine sample and are independent of patient symptoms, co-morbidities, medication exposure or other lab test results.

| Susceptibility Patterns of Most Common Urine Isolates January to December 2015 | <i>Escherichia coli</i> | <i>Klebsiella pneumoniae</i> | <i>Proteus mirabilis</i> |
|--|-------------------------|------------------------------|--------------------------|
| ANTIMICROBIALS | % | % | % |
| AMPICILLIN | 60 | - | 87 |
| CEFAZOLIN ¹ | 93 | 97 | 96 |
| LEVOFLOXACIN | 85 | 99 | 78 |
| NITROFURANTOIN | 99 | 73 | - |
| TRIMETH/SULFA | 82 | 95 | 78 |

¹ Surrogate for oral cephalosporins and uncomplicated UTI

Non-pregnant women (outpatients) with typical symptoms of uncomplicated sporadic cystitis can usually be treated with appropriate empiric antibiotics and often DO NOT require urine culture. *E. coli*, one of the gram-negative bacteria that generate urine nitrites, is the most common pathogen.

Urinalysis with reflex to culture is NOT an appropriate test to determine B-hemolytic streptococci colonization in a pregnant patient.

Significantly ill, neutropenic, pregnant, or recently hospitalized/recently catheterized patients, as well as infants/young children, in whom a urinary tract infection is suspected, should have a urine sample submitted directly for culture without depending on the "reflex" option (SBMF No. 21054).

In cases where empiric antibiotic administration is not advisable, if a patient's urinalysis does not reflex to culture, and a urinary tract infection is clinically probable, a culture (SBMF No. 21054) can be performed if ordered separately **within two days** after original specimen collection. If more than two days after original collection; submit a fresh clean-catch midstream or catheterized urine specimen for culture.

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530 North Lafayette Boulevard • South Bend, Indiana 46601
 (574) 234-4176 • Elkhart (574) 293-8441 • (800) 544-0925
 Joyce L. Simpson, M.D. • Medical Director

For additional information please contact Kristen Jacobs, M.D., Mary G. Stepney, or Nan Boston at The Medical Foundation, (574)234-4176 or (800)544-0925.

| Urine Specimens Reflexed to Urine Culture | Specimens Cultured | Specimens with pathogens | Percent of Total |
|--|---------------------------|---------------------------------|-------------------------|
| Old criteria | 1685 | 527 | 31% |
| New criteria | 980 | 477 | 49% |
| Not cultured by new criteria | 705 | 50 | 7% |

References:

- Bates BN, 2013. Interpretation of Urinalysis and Urine Culture for UTI Treatment, US Pharm.38 (11):65-68
- Bure EM and Kehl KS, 2011. A Critical Appraisal of the Role of Clinical Microbiology Laboratory in the Diagnosis of Urinary Tract Infections, J. Clin. Microbiol. 49 (9_Supplement): S34-S38
- DeRosa R et al, 2010 Evaluation of the Sysmex uF1000i Urine Flow Cytometer for Ruling out Bacterial Urinary Tract Infection. Clin Chem Acta 411:1137-1142
- Giesen CD et al, 2013. Performance of Flow Cytometry to Screen for Bacteria and White Blood Cells Prior to Urine Culture, Clin Biochem 46(9) 810-813
- Jones CW, Culbreath KD, Mehrotra A, and Gilligan PH, 2014. Reflex Urine Culture Cancellation In the Emergency Department. J Emerg Med 46(1), 71-76
- Kwon JH, Fausone MK, Hongyan Du, Robicsek A and Peterson LR, 2012. Impact of Laboratory-Reported Urine Culture Colony Counts on the Diagnosis and Treatment of Urinary Tract Infection for Hospitalized Patients, Am J Clin Pathol 137:778-784
- Urinalysis (UA) and the Diagnosis of UTIs, Pearls of Knowledge, 2013 Health Partners, https://www.healthpartners.com/ucm/groups/public/@hp/@public/@ime/@content/documents/documents/cntrb_037895.pdf

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