

Investigation and Assessment of Urine Culture Importance in the Evaluation of Uncomplicated Urinary Tract Infections in an Urgent Care Setting

Urgent message: With urinary tract infections being a common presentation to urgent care, firm guidance on the value of culture and sensitivity at time of presentation could both help improve outcomes and reduce unnecessary cost.

DIANNE TREACY LORE DNP, FNP-BC, CPNP-PC and MARLENA SEIBERT PRIMEAU DNP, FNP-BC, NHDP-BC, BSHEC

Citation: Lore DT, Primeau MS. Investigation and assessment of urine culture importance in the evaluation of uncomplicated urinary tract infections in an urgent care setting. *J Urgent Care Med.* 2021;16(2):37-41.

Abstract

Purpose

Urinary tract infections negatively affect over 150 million individuals globally each year. Traditional management encompasses evaluating a urine culture and sensitivity (C&S). Although the guidelines set forth by the American College of Obstetricians and Gynecologists and the European Association of Urology recommend against the use of culture and sensitivity at the outset of treatment of an uncomplicated urinary tract infection, there is no formal policy in place at many primary care and urgent care clinics.

Population and Setting

The population parameters consisted of healthy, non-pregnant females 18 to 65 years of age who presented to the urgent care clinic with symptoms of dysuria. The setting was a suburban urgent care clinic in the southeastern United States.



©AdobeStock.com

Project Design

The project design consisted of the implementation of an evidence-based clinical practice guideline for quality improvement and development of a formal clinic policy in the treatment of uncomplicated urinary tract infections.

Author affiliations: Dianne Treacy Lore DNP, FNP-BC, CPNP-PC, The University of Alabama in Huntsville College of Nursing. Marlena Seibert Primeau DNP, FNP-BC, NHDP-BC, BSHEC, The University of Alabama in Huntsville College of Nursing.

Evidenced-Based Procedure

The quality improvement project collected and analyzed data involving patients who presented with urinary symptoms consistent with a diagnosis of an uncomplicated urinary tract infection. The data were collected pre- and postintervention from the electronic medical record. Using the current ACOG evidence-based clinical practice guideline for the treatment of uncomplicated urinary tract infections as the foundation, a quality improvement clinical education presentation was provided to the providers of one urgent care clinic. The intervention was not ordering a urine culture and sensitivity on the selected population.

Evaluation

The outcome of this project was determined after the analysis of the pre- and postintervention data using a sample T-test.

Results

ACOG guideline application resulted in a 30% reduction in the ordering of a C&S in this population with no increase in the rate of follow-up needed in this postintervention group. The anticipated results supported the current ACOG clinical practice guideline and provide a basis for a formal policy in the urgent care setting.

Conclusion and Implications

Projects such as the one discussed here demonstrate that outcomes can be improved by promoting and implementing evidence-based clinical practice guidelines.

Introduction

Bacterial infections such as urinary tract infections (UTIs) negatively affect over 150 million individuals globally each year.¹ A woman's risk of acquiring a UTI is greater than a man's due to their anatomical structure; the urethra of a female is both shorter and closer to the rectum than the male, increasing the risk of colonization of bacteria from the rectum. Other factors that place a female at increased risk for a UTI are sexual interaction, intercourse with a new partner, spermicidal use, poor hygiene, and history of UTIs as a child.² The majority of the UTIs diagnosed annually are labeled as uncomplicated.^{2,3}

An uncomplicated UTI is defined as an infection in the lower urinary tract among healthy, nonpregnant women with symptoms of burning upon urination, urinary urgency and/or frequency, and without the presence of flank pain, fever, vaginal pain, or discharge. The diagnosis of an uncomplicated UTI is made after a

collection of subjective and objective data, including a thorough history of current symptoms, a physical examination, and the presence of leukocytes, blood, and/or nitrates on a urinalysis.²

Although characterized as having an "uncomplicated" UTI, many patients are negatively impacted by this condition. In the United States, UTIs constitute more than 10 million healthcare appointments with expenditures estimated to be over \$1 billion annually.⁴ Approximately 70% of all adult women will acquire a UTI during their lifespan.⁴

Traditional management for an uncomplicated UTI encompasses evaluation of the results through use of a urine culture and sensitivity (C&S). A C&S provides key information such as the bacteria involved and the antibiotic appropriate in the management of an uncomplicated UTI.⁵ Conventional treatment of UTIs utilizes C&S testing to ensure that bacteria-to-drug mismatches don't result in incomplete healing and return visits.

Although this has been the traditional standard of care, the American College of Obstetricians and Gynecologists, the Centers for Disease Control and Prevention, and the European Association of Urology now recommend against the use of a C&S at the outset of treatment of uncomplicated UTIs.^{2,6,7} Since the bacteria *E coli* accounts for 75% to 95% of uncomplicated UTIs, a C&S does not alter the treatment or improve patient outcomes.^{8,9} According to Stapleton,⁹ a C&S should only be obtained for the diagnosis of complicated or recurrent UTIs.

Overall, laboratory tests can deliver valuable and life-saving information for healthcare providers and are helpful in improving patient outcomes. When ordered appropriately, laboratory tests can assist directly in patient care and in the delivery of safe and affordable healthcare; however, when lab tests are ordered unnecessarily, these tests can add to the healthcare cost burden.¹⁰ According to Carroll,¹¹ the Institute of Medicine reported that in 2013 over \$200 billion was spent in America on "unnecessary services" such as superfluous laboratory tests.

The point-of-care testing (POCT) urinalysis, sometimes referred to as urine dip or dipstick, is a quick laboratory test performed onsite to detect substances in the urine sample.

It is a quick and inexpensive technique that is both sensitive (75%) and specific (82%) when searching for leukocytes or nitrates in urine.² Per ACOG, the treatment of a symptomatic and uncomplicated UTI with leukocytes, blood, or nitrates noted on a POCT urinalysis does not require a C&S. A POCT urinalysis is a low-

cost solution to contain healthcare expenses while providing quality patient care.²

Methods

Over the past year, there has been increased discussion among providers at a university-affiliated urgent care clinic in North Carolina regarding the advantages and disadvantages of a C&S as part of the protocol for the treatment of uncomplicated UTIs. The debate between providers embodied the pros and cons of both approaches, as well as considerations of patient and provider time costs and ultimately the cost-effectiveness of the laboratory procedure.

A quality improvement project was developed to address this concern. Based on current ACOG clinical guidelines, the project’s goal was to ascertain the occurrence of unresolved UTI symptoms if C&S were not initially ordered for patients being treated for uncomplicated UTIs in healthy, adult nonpregnant females 18 to 65 years of age in an urgent care setting.

The urgent care clinic where the investigation took place is fast-paced and diverse, and an institution where patients visit for a myriad of urgent healthcare concerns throughout their lifespan. A substantial number of women within the target population present to this facility with UTI complaints. Based upon peer provider discussions, urine cultures represent a significant portion of the laboratory specimens obtained.

The population chosen for the project were healthy, nonpregnant females, 18 to 65 years of age, who presented to the urgent care setting with burning upon urination, urinary urgency and/or frequency, and possible blood, leukocytes, and nitrates identified in their POCT urinalysis results. However, these patients did not present with flank pain, fever, vaginal irritation, or discharge. The exclusion criteria were males, pregnant females, females with a history of recent UTIs, recent antibiotic use, diabetes, kidney disease, immunosuppression, or females below 18 or above 65 years of age.

Data were collected from electronic medical records (EMRs) retrospectively via chart review for 1 month prior to the intervention. During the preintervention phase, the number of patients treated for an uncomplicated UTI was compared to the number of patients who either returned to the urgent care with unresolved symptoms after initial treatment or were called and needed follow-up for unresolved symptoms postvisit.

Using the current, evidence-based ACOG guidelines for the treatment of uncomplicated UTIs as the foundation, a quality improvement clinical education session was presented to the clinic providers. The inter-

Table 1. QI Project Data Collection Results

	Preintervention	Postintervention
Number of participants	20	20
Mean age	39.35 years	36.85 years
Burning upon urination (%)	13 (65%)	17 (85%)
Urinary urgency	11 (55%)	5 (25%)
Urinary frequency	17 (85%)	14 (70%)
Blood in urine	14 (70%)	17 (85%)
Nitrates in urine	5 (25%)	6 (30%)
Leukocytes in urine	15 (75%)	13 (65%)
Urine culture and sensitivity sent	17 (85%)	11 (55%)
Full resolution of symptoms	12 (60%)	19 (95%)
Postvisit ED follow-up	2 (10%)	1 (5%)
Postvisit PCP visit	4 (20%)	0 (0%)
Postvisit urgent visit	2 (10%)	0 (0%)

vention advised against the use of C&S laboratory tests in the assessment of uncomplicated UTIs, and showed the evidence supporting this change. With no C&S laboratory tests being ordered for the subject population, postintervention data were collected through chart review for 1 month.

Results

A total of 40 women met the inclusion criteria for both pre- and postintervention sampling. Data were collected from 20 preintervention EMRs and 20 postintervention EMRs. The preintervention data showed the average age of the women in this group to be 39.35 years of age. A C&S was sent for 17 (85%) of the women. When called postvisit, eight (40%) did not have full resolution. Two (10%) stated they needed to follow up in the emergency department. Four (20%) followed up with their primary care provider, and two (10%) returned to an urgent care. (See **Table 1**). The postintervention data showed the average age of the women in this group to be 36.85 years of age. A C&S was sent for 11 (55%) of the women. When called postvisit, one (5%) did not have full resolution. One (5%) stated they needed to follow up in the ED, none followed up with their PCP, and none returned to UC. ACOG guideline application resulted in a 30% reduction in the ordering of a C&S in

this population with no increase in the rate of follow-up needed in this postintervention group.

Conclusions

The results of the quality improvement project supported ACOG's clinical guidelines regarding the assessment of uncomplicated UTIs in the nonpregnant, adult female population. The educational session attended by the providers appeared to play a key role in reducing unnecessary C&S studies and increasing provider awareness of ACOG guidelines for current evidence-based practice. These findings also supported the position that quality patient care can be maintained while healthcare costs are reduced for this population in the urgent care setting.

Projects such as the one discussed here improve patient care outcomes by promoting and implementing evidence-based clinical practice guidelines. Ensuring guideline implementation and sustainability involves ongoing open communication and active involvement by all stakeholders of the urgent care team.

Limitations

The project improved patient outcomes and reduced unnecessary lab testing, but did have limitations. The sample size was lower than the projected sample size.

There was a reduction in the number of patients who presented to the urgent care during the time of data collection, possibly due to the impact of COVID-19. Replication of this project on a larger or continued scale, or using an experimental study format, would be helpful in confirming these findings. ■

References

1. Flores-Mireles A, Walker J, Caparon M, Hultgren S. Urinary tract infections: epidemiology, mechanisms of infection and treatment options. *Nat Rev Microbiol*. 2015;13(5):269-284.
2. ACOG.org. Treatment of urinary tract infections in nonpregnant women. 2021. Available at: <https://www.acog.org/-/media/project/acog/acogorg/clinical/files/practice-bulletin/articles/2008/03/treatment-of-urinary-tract-infections-in-nonpregnant-women.pdf>. Accessed February 3, 2021.
3. Poon E, Self L, McLeod S, et al. Uncomplicated urinary tract infections in the emergency department: a review of local practice patterns. *CJEM*, 2017;20(4):572-577.
4. Abou Heidar NF, Degheili JA, Yacoubian AA, Khauli RB. Management of urinary tract infection in women: a practical approach for everyday practice. *Urol Ann*. 2019;11(4):339-346.
5. Mishra B, Srivastava S, Singh K, et al. Symptom-based diagnosis of urinary tract infection in women: are we over-prescribing antibiotics? *Int J Clin Pract*. 2012;66(5):493-498.
6. Uroweb.org. 2021. Available at: <https://uroweb.org/wp-content/uploads/EAU-Guidelines-on-Urological-Infections-2018-large-text.pdf>. Accessed February, 2021.
7. CDC.gov. 2021. Adult treatment recommendations | community | antibiotic use | CDC. Available at: <https://www.cdc.gov/antibiotic-use/community/for-hcp/outpatient-hcp/adult-treatment-rec.html>. Accessed February 3, 2021.
8. Hopkins L, McCroskey D, Reeves G, Tanabe P. Implementing a urinary tract infection clinical practice guideline in an ambulatory urgent care practice. *Nurse Pract*. 2014;39(4):50-54.
9. Stapleton A. Urine culture in uncomplicated UTI: interpretation and significance. *Curr Infect Dis Rep*. 2016;18(5):15.
10. Salinas M, Flores E, López-Garrigós M, Leiva-Salinas C. 2018. Laboratory test inappropriateness: lessons revisited and clarified in seven questions. *J Lab Precis Med*. 2018;3:34-47.
11. Carroll A. The high costs of unnecessary care. *JAMA*. 2017;318(18):1748.



CORE CONTENT IN URGENT CARE MEDICINE

Earn CME Credits From The #1 Urgent Care Training Program

- We have the only program developed by leaders in urgent care medicine and modeled after urgent care medicine fellowships.
- Our 62 hour, 8 module course spans the topics commonly seen in an urgent care setting, providing refresher content for urgent care veterans and preparing new providers for their first day.
- Meet CME requirements easily, where and when you choose.
- \$750. Group pricing is also available, contact us at info@urgentcarecme.com



Accreditation Statement: This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of Case Western Reserve University School of Medicine and Institute of Urgent Care Medicine. Case Western Reserve University School of Medicine is accredited by the ACCME to provide continuing medical education for physicians.

Case Western Reserve University School of Medicine designates this enduring material for a maximum of 62 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Save 15% with coupon code **JUCM15**

www.urgentcarecme.com | 844-814-9135