

# Acute Cystitis in Women: Experience with a Telephone-Based Algorithm

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## ABSTRACT

**Objective:** This paper evaluates short-term (60-day) outcomes for women with symptoms of acute cystitis evaluated and treated with a telephone-based protocol.

**Methods:** We used a retrospective analysis of medical records of patients evaluated and treated according to a guideline-based algorithm for symptoms of acute cystitis.

**Results:** The algorithm was utilized in the care of 273 women reporting symptoms of urinary tract infection (UTI), with 75.4% being treated without urinalysis or cultures. Over the next 60 days, 46 (16.8%) were seen or made phone contact for recurrent or persistent urinary tract symptoms, with 6 patients (2.2%) diagnosed with pyelonephritis. No other adverse events were identified in the 60 days after use of the protocol.

**Conclusions:** A telephone-based nurse evaluation and treatment algorithm can allow for successful management of the majority of women identifying symptoms of uncomplicated lower UTIs.

## INTRODUCTION

Lower urinary tract infection (UTI), or *cystitis*, is one of the most common clinical diagnoses in women.<sup>1</sup> Overall expenditures for this diagnosis, excluding spending on outpatient prescriptions, exceeded an estimated \$2.47 billion in 2000.<sup>2</sup> Estimated lifetime risk is greater than 50%, with an annual incidence of 10%.<sup>2,3</sup>

Approaches to management of symptoms of dysuria, urgency, and frequency have varied. Urinalysis, and often a urine culture, is ordered to make the diagnosis and initiate treatment. However, a growing literature demonstrates that most UTIs can be diagnosed and

treatment prescribed over the telephone. If a woman presents with at least 2 symptoms of a UTI and has no vaginal discharge or irritation, she has a >90% chance of having a UTI.<sup>4</sup>

Experience with telephone-based protocols for management of urinary symptoms has been limited. Barry et al<sup>5</sup> at Michigan State University's Family Practice department performed a randomized controlled trial of telephone management in 72 women, with favorable results. Saint et al<sup>6</sup> at Group Health in Seattle established a clinical guideline and retrospectively evaluated claims data to demonstrate no increased complications in women managed this way. Vinson and Quesenberry<sup>7</sup> at Kaiser Permanente in Northern California analyzed and reported their 3-month experience with a telephone-based algorithm via which more than 4000 women were managed. However, no reports of the use of protocols in clinical practices, utilizing medical record review, have been published. The purpose of this review was to evaluate the effectiveness of such a protocol managed within the Departments of Obstetrics and Gynecology and Family Practice in a multispecialty group practice setting.

## MATERIALS AND METHODS

This study was performed at the Department of Obstetrics and Gynecology and Family Practice at Gunderson Lutheran Medical Center in La Crosse and Onalaska, Wis. The process began in spring 2004 with a review of the literature regarding the evaluation and treatment of lower UTIs in women. Guidelines were acquired from a number of other organizations, and a committee—including obstetrician-gynecologists, nurses, family practitioners, quality improvement support staff, and infectious disease specialists—was formed to develop a clinical practice guideline. The goal for this group was the development of a protocol to allow for resolution of patient symptoms in a rapid and efficient manner, without significant adverse events.

An algorithm was developed and made available electronically to clinicians on the organization's clinical

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workstation (Appendix). The algorithm was presented to the Department of Obstetrics and Gynecology clinicians and nurses and was adopted as a standing order in July 2004. In April 2006, the Family Practice Department at the Onalaska Gundersen Lutheran offices adopted the protocols and standing orders.

Printed copies of this algorithm were provided to the nurses performing telephone triage within the department. After resolution of the patients' care, the algorithms were sent to the first author for quality review. Utilizing the medical center's electronic medical record, data regarding any subsequent office visit, contact by telephone, or interaction with urgent care or emergency department were collected. All data were entered onto an Excel spreadsheet. Institutional Review Board (IRB) approval was obtained for this study prior to initiation of the review phase.

## RESULTS

From July 12, 2004, to October 11, 2006, the algorithm was used 273 times, representing 237 unique patients. Median patient age was 35 years (range 17–85), with median gravidity of 2 and parity of 2.

Results are provided in Table 1. Over 75% (206 of 273) of telephone interactions permitted treatment without a urinalysis or referral to an urgent care or emergency facility. Due to identifiable risk factors, 45 patients were requested to present for urinalyses, with 16 interpreted as negative and 29 as positive (based on individual clinician-determined criteria). Twelve urine cultures were ordered per protocol, with 5 positive for *Escherichia coli*; 1 positive for *Staphylococcus*, coagulase negative; 1 contaminated; and 5 negative.

Ten patients were referred to emergency or urgent care facilities because of possible pyelonephritis. Cystitis was diagnosed in 5 of these patients, pyelonephritis was diagnosed in 2, and 3 were referred to centers out of our system, with no follow-up obtained.

Twelve patients were seen within the gynecology or family practice clinic within 24 hours for screening for sexually transmitted diseases (STDs). No STDs were identified, but 3 yeast infections were diagnosed.

A 3-day course of double-strength sulfamethoxazole/trimethoprim was the first line treatment for 197 patients. Ciprofloxacin was prescribed for 49 patients. Other antibiotics were prescribed for patients with allergies or with other contraindications.

Over the 60 days following initial contact, 163 office visits or telephone contacts unrelated to cystitis were documented in the records of the 273 patients. Forty-six visits and telephone calls concerning urinary tract

**Table 1.** Results After Use of Algorithm

Total Patient Contacts	273
Referred to urgent/emergent facility	10 (3.7%)
Given appointment for STD screening	12 (4.4%)
U/A requested without office visit	45 (16.5%)
Treatment without U/A, culture, or referral	206 (75.4%)
Total urinalyses performed	48 (17.6%)
Total cultures performed	16 (5.9%)
Follow-up Within 60 Days	
Contact for urinary symptoms	46 (16.8%)
Diagnosed with pyelonephritis	6 (2.2%)

symptoms were made to the Gynecology, Urgent Care, Family Practice, or Urology Departments in the 60-day period. Pyelonephritis was diagnosed in 6 (2.2%) patients within the 60-day period after initial treatment. One patient returned 2 weeks after initial therapy with symptoms suggestive of pyelonephritis, but evaluation established urolithiasis. Pyelonephritis was diagnosed in 5 additional patients 2, 3, 6, 14, and 38 days after initial telephone contact. No other adverse outcomes were identified. Patient satisfaction was not measured; however, many favorable patient comments were received in regard to the telephone triage/treatment.

## DISCUSSION

This study supports the appropriateness of a telephone-based evaluation and treatment regimen for uncomplicated lower urinary tract infections in women. Many women recognize the symptoms of cystitis based on experience and can be trusted to be correct in the initiation of therapy. We believe that many patients already receive treatment by telephone, but without effective evaluation or triage. The primary purpose of the screening algorithm is to identify high-risk individuals who require more complete evaluation and alternative therapies. It also standardizes therapy for patients with uncomplicated cystitis, ensuring the best evidence-based treatment.

The low rate of return visits to our clinic, an urgent care center, or the emergency department (16.8%) in the interval after treatment compares favorably with reports from Saint et al<sup>6</sup> (13% within 60 days) and Vinson and Quesenberry<sup>7</sup> (17.9% within 6 weeks). Both groups report a pyelonephritis rate in the period immediately after treatment of 1%, whereas our rate was 2.2%. However, their studies relied on a review of claims data, while our study utilized a review of medical records, which may have captured more patient-provider treatment interactions (including telephone calls). As in previous studies,

no reportable adverse events secondary to the treatment regimen occurred with the exception of 2 patients who developed rashes, necessitating a change in antibiotics.

A number of advantages of the protocol can be demonstrated. By limiting the care to a telephone call to a nurse, patients were saved a clinic visit. This improved access to physicians' schedules for other patients. Furthermore, the laboratory benefited from the elimination of relatively labor-intensive urinalyses for which reimbursement may, at best, approximate costs. Patients indicated great satisfaction with the protocol.

Our algorithm is attached as an appendix to this report, and others are readily obtainable from other sources. However, we believe that ownership is enhanced when protocols, algorithms, and standing orders are developed locally. Further, the algorithm must be developed knowing the availability of urinalyses, STD screening examinations, and urgent care facilities, all of which can vary from location to location. It must also be designed to take into account variations in patient population. For example, our patient population is primarily middle-class, and not economically disadvantaged. In a population in which STDs occur at a much higher rate or in which follow-up is much less likely to occur, such as in a population seeking care in an emergency department setting, a safe and effective algorithm would need to reflect those differences.<sup>8</sup> Choice of antibiotics, too, must be based on the resistance patterns in each community.<sup>9</sup> Regular reevaluation of the literature and a review of local sensitivity patterns are required to keep the guideline and algorithm current, and periodic quality reviews are required to ensure appropriate use of the algorithm and the standing orders.

Limitations of our study include the possibility that we may not have identified all patients who received care following initial triage with this protocol. Although Gundersen Lutheran is an integrated medical center, with multiple locations, not all patients may have received follow-up care within our departments, our urgent care center, or our emergency facilities. However, patients were advised to re-contact us for follow-up care or with any concerns, and we believe that very few patients sought care from outside our integrated system. We also recognize that the size of the study population that would be necessary to achieve certainty that the protocol is safe and effective cannot be ascertained: the very next patient who receives care by this protocol might experience a complication. We are confident, however, that the size of the population studied was sufficient to identify patterns of care and to help us ensure this protocol was safe and effective.

In summary, a telephone-based evaluation and treatment protocol for cystitis in women represents an appropriate alternative and might be considered in other clinical settings.

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## Algorithm for Evaluating and Treating a Woman with Symptoms of Acute Cystitis (age 18+)

Note: Patients may be treated by phone, or in person. Patients should be given the opportunity for an office visit, if this meets their needs better. Patients should receive their care from their primary care provider's department.

**Woman with  $\geq 1$  Symptom of UTI**  
 Frequency     Urgency  
 Dysuria

↓

**Risk factors for complicated UTI**  
 History of polycystic kidneys  
 Kidney stones  
 Neurogenic bladder  
 Renal insufficiency  
 Immunosuppression  
 Indwelling catheter  
 Recent urinary tract instrumentation, or UTI  
 Pregnancy  
 Diabetes

↓

Flank pain, fever, chills, vomiting, diarrhea, dehydration, or symptoms for  $\geq 7$  days

↓

Vaginal Discharge? Irritation?(possible vaginitis)  
 New sexual partner within last 6 months? (possible STD)  
 Vaginal sores (possible STD)

↓

$\geq 2$  UTI symptoms  
 Dysuria  
 Frequency  
 Urgency  
 Hematuria

↓

Perform clean, voided dipstick UA  
 Positive for leukocyte esterase or nitrites

↓

Microscopic U/A and/or discuss with provider

**Patient Sticker may be placed here or fill in:**

**Patient's Name:** \_\_\_\_\_

**Med Record Number:** \_\_\_\_\_

**Date:** \_\_\_\_\_

Yes to any →  U/A, hold for culture. Discuss with provider. If pregnant, follow the standing order for UTI symptoms in pregnancy.

Yes →  Possible pyelonephritis. U/A and culture. Provide same-day appointment or refer to Urgent Care or TEC

Yes →  Offer an appointment within 24 hrs or refer to Urgent Care or TEC.

**Treatment Regimen**

If not allergic to sulfas, call prescription for sulfamethoxazole/trimethoprim DS bid for 3 days to pharmacy of pts choice. \*

If allergic to sulfas, call prescription for Ciprofloxacin 250 mg bid for 3 days to pharmacy of choice.\*

Document in Patient Contact for provider signature

Remind patient that symptoms may take more than 3 days to resolve, but to call if symptoms do not improve in 4 days or recur

Patient's choice: Rx for Pyridium 200 mg TID for 2 days (OTC \$8.00)

\* Patients on coumadin may have altered INRs when treated with SMX/TMP or Cipro. Discuss with clinician.

**After completion of documentation, send this form to Dr. \_\_\_\_\_ for quality review.**

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Appendix. Algorithm for evaluating and treating a woman with symptoms of acute cystitis.

# Wisconsin Medical Journal

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