

# Clinical Pathways for the Management of Urinary Tract Infection in Family and Community Practice

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**Background:** Urinary tract infection (UTI) is mainly caused by *Escherichia coli* and is more common among women than men because of the anatomic difference in the urogenital tract. The management of UTI is not always optimal in terms of diagnostic tests, antibiotic prescription and the length of treatment.

**Method:** The PAFP Clinical Pathways Group reviewed published medical literature to identify and summarize clinical information on diagnostics, interventions and clinical indicators or outcomes to develop an evidence-based clinical pathway in family medicine practice. The group developed a time-related representation of recommendations on patient care processes, in terms of history and physical examination, laboratory tests, pharmacologic and non-pharmacologic interventions as well as social and community strategies to treat UTI and prevent complications.

**Recommendations:** Comprehensive history and physical examination focusing on dysuria, increased urinary frequency, and incontinence described as first or recurrent incident. Risk factors include sexual intercourse, use of contraceptive diaphragms in women, mechanical and/or physiologic factors that affect bladder emptying and other complicating condition such as diabetes must be elicited. Physical examination may be normal or show flank or hypogastric tenderness. In terms of diagnostic tests, urine dipstick or microscopic urinalysis may be done. If there are anatomical or other complications ultrasound or imaging studies if structural abnormality, and urine culture and sensitivity may be done.

For treatment, a 3-day course of antibiotics for uncomplicated UTI and 7 days for complicated UTI may be done. Symptomatic treatment with paracetamol/NSAID may also be given. Non-pharmacologic intervention include increase fluid intake, avoidance of delay bladder emptying, discussion and correction of risk factors, and emphasize compliance to medications and laboratory requests. Patients should be aware of the diagnosis and risk factors and they must commit to comply with antibiotic treatment.

## INTRODUCTION

Urinary tract infection (UTI) is a symptomatic infection of the urinary tract, mainly caused by *Escherichia coli*. It is common among women than men because of the anatomic difference in the urogenital tract. One in three women develop a urinary tract infection during their lifetime

(compared to 1 in 20 men).<sup>1</sup> The young and sexually active are commonly affected as well as the elderly, and postmenopausal women. The likelihood of recurrence is high.<sup>2</sup>

The diagnosis is often based on clinical symptoms. However, there are some cases that are asymptomatic (asymptomatic bacteriuria). In a one-year morbidity survey

of urinary tract diseases in general practice, only half of all the patients with symptoms of urinary tract infection had significant bacteriuria. In younger male with symptoms of urinary tract infection, bacteriuria was not common.<sup>3</sup>

The management of UTI is not always optimal in terms of diagnostic tests, antibiotic prescription and the length of treatment. The diagnosis is usually based on symptoms and the presence of leucocytes and nitrites in the urine. Urine culture is not necessary. Unfortunately, urinalysis is often routine test made by family physicians. However in an analysis of inter-laboratory variation of urine samples from primary care, there was an almost twofold difference between the lowest and highest positivity rates that could not be explained by differences in population.

Laboratory-based studies of UTI are likely to underestimate the true incidence of this infection.<sup>4</sup> In terms of treatment, the recommendation is short-term therapy with antibiotics.<sup>5</sup> It is with regards to treatment that there is a significant variation in practice. In a sample of first-time ambulatory care visits for treatment of UTI among female patients, 13.5% were prescribed broad-spectrum antibiotics. Family medicine specialists were more likely than obstetrics and gynaecology to prescribe broad-spectrum antibiotics. Office-based doctors were 1.41 times more likely than hospital-based doctors to also prescribe antibiotics.<sup>6</sup> In another survey among general practitioners, antibiotic was the most frequently used for the treatment of cystitis, with most doctors prescribing a five day course. This is in contrast to most guidelines' recommendation which is a short three-day course.<sup>7</sup> There is also significant variation in the choice of antibiotics. Nitrofurantoin was the antibiotic of first choice of obstetricians, while others chose trimethoprim-sulfamethoxazole.<sup>8</sup>

This is part of the series of clinical pathways developed by the PAFP through its QA Committee. This clinical pathway for UTI is for immune-competent men and women consulting for UTI in outpatient clinics. The targeted users are family and community health care practitioners. The clinical pathway recommendations are in a table format that include options and recommendations on medical history taking and physical examination, laboratory diagnosis,

pharmacologic and non-pharmacologic treatment and expected patient outcomes. The PAFP Clinical Pathway Committee sat as expert panel and graded the strength of the recommendation and the quality of the evidence. The panel also recommended measures aid in implementation and monitoring compliance with the recommendations.

The purpose of this pathway is to provide assistance to clinicians in the diagnosis and treatment of two specific types of urinary tract infections (UTIs): uncomplicated, acute, symptomatic bacterial cystitis and acute pyelonephritis in women.

### **Methods of Development and Implementation**

The PAFP Clinical Pathways Group reviewed published medical literature to identify, summarize, and operationalize the clinical content of diagnostics, interventions and clinical indicators or outcomes to develop an evidence-based clinical pathway in family medicine practice. The group developed a time-related representation of recommendations on patient care processes, in terms of history and physical examination, laboratory tests, pharmacologic and non-pharmacologic interventions as well as social and community strategies to treat UTI and prevent complications.

The group adopted several strategies and undergo regular review in developing the recommendations. The first strategy is emphasizing on evidence-based recommendations as recommended assessments and interventions. The second strategy is recognition of potential variations between-patient and between specific practice settings. The third strategy is the recognition of "stakeholder groups" in family and community practice with careful attention to getting their opinion and support but without sacrificing the objectives of the project. The fourth strategy is emphasis on the commitment to establishment of the ultimate goal of improving the effectiveness, efficiency and quality of patient care in family and community practice.

For the first strategy, the group search Pubmed and using the MESH terms "urinary tract infection", "diagnosis" and "treatment". Retrieval of articles was focused on the following type of clinical publications, clinical practice

guidelines, meta-analysis, randomized controlled trials and clinical trials. The most recent publication was prioritized over the older publications. The evidences for the patient care processes were reviewed and summarized as notes on the recommendations. The second strategy was to present the recommendations to the QA Committee who acted as panel of experts and discussed potential variations in different setting of family practice. As part of the third strategy, the clinical pathway will then be disseminated to the selected PAFP chapters and members and other stakeholders for consensus development. Dissemination will be through publication in the Filipino Family Physician Journal, conference presentations (PAFP Annual Convention) and focused group discussions.

As a fourth strategy, the implementation of clinical pathways to be adopted by the PAFP will be quality improvement activities in a form of patient record reviews, audit and feedback. Audit standards will be the assessment and intervention recommendations in the clinical pathway. Implementation of clinical pathways will be at the practice level and the organizational level. Practice level can be a simple count of family and community medicine practitioners using and applying the clinical pathways. Organizational outcomes can be activities of the PAFP devoted to the promotion, development, dissemination and implementation of clinical pathways.

### Grading of the Recommendations

The PAFP QA Committee met as a panel and graded the recommendations as shown in Table 1. The grading system was a mix of the strength of the reviewed published evidence and the consensus of a panel of experts. In some cases, the published evidence may not be applicable if Philippine family practice setting, so a panel grade based on the consensus of clinical experts was also used. Thus if the recommendation was based on a published evidence that is a well done randomized controlled trial and the panel of experts voted unanimously for the recommendation, it was given a grade of A-I. If the level of evidence is based on an observational study but the panel still unanimously

considered the recommendation, the grade given was A-II and if the level of evidence is just an opinion but the panel still unanimously recommended it, the grade was A-III.

**Table 1.** Grading of the recommendations

Panel Grade Level	Evidence Grade Level		
	1	2	3
A	A-I	A-II	A-III
B	B-I	B-II	B-III
C	C-I	C-II	C-III

### Panel Grade Levels

- A - All the panel members agree that the recommendation should be adopted because it is relevant, applicable and will benefit many patients.
- B - Majority of the panel members agree that the recommendation should be adopted because it is relevant, applicable in many areas and will benefit many patients.
- C - Panel members were divided that the recommendation should be adopted and is not sure if it will be applicable in many areas or will benefit many patients.

### Evidence Grade Levels

- I - The best evidence cited to support the recommendation is a well-conducted randomized controlled trial. The CONSORT standard may be used to evaluate a well-conducted randomized controlled trial.
- II - The best evidence cited to support the recommendation is a well-conducted observational study i.e. match control or before and after clinical trial, cohort studies, case control studies and cross-sectional studies. The STROBE statement may be used to evaluate a well-conducted observational study.
- III - The best evidence cited to support the recommendation is based on expert opinion or observational study that did not meet the criteria for level 2.

In the implementation of the clinical pathways, the PAFP QA Committee strongly recommends compliance to guideline recommendations that are graded as either A-I, A-II or B-I. However, the Committee also recommends using sound clinical judgment and patient involvement in the decision making before applying the recommendations.

### Notes on the Recommendations

Acute lower urinary tract infection is one of the most common infections managed in family and community

practice. Because of anatomic difference, it is more common in non-pregnant, adult women than in men. The medical history and urinalysis are often the basis for the diagnosis. Most patients will be cured by a three-day oral antibiotic treatment.<sup>9</sup> The recommendations in this clinical pathway are based on published literature and passed through an evaluation of an expert panel. In the development of the recommendations, the Committee placed equal emphasis on the published evidence and expert panel recommendations.

#### Pathway Recommendations

Visit	Pathway Tasks				Patient Outcomes
	History and Physical Examination	Laboratory	Pharmacologic Intervention	Non-pharmacologic Interventions	
First Visit	<p>___ Comprehensive history and physical examination focusing on dysuria, increased urinary frequency, and incontinence described as first or recurrent incident (A-II)</p> <p>___ Elicit risk factors include sexual intercourse, use of contraceptive diaphragms in women, mechanical and/or physiologic factors that affect bladder emptying and other complicating condition such as diabetes (A-II)</p> <p>___ Physical examination may be normal or show flank or hypogastric tenderness (A-II)</p>	<p>___ Urine dipstick or microscopic urinalysis (B-II)</p>	<p>___ 3-day course of antibiotics for uncomplicated UTI and 7 days for complicated (A-I)</p> <p>___ symptomatic treatment with paracetamol/NSAID if warranted (A-I)</p>	<p>___ Increase fluid intake and avoidance of delay bladder emptying (A-II)</p> <p>___ Discussion on risk factors (A-II)</p> <p>___ Emphasize compliance to medications and laboratory requests (A-II)</p> <p>___ Advice follow-up after 3-7 days (A-III)</p>	<p>___ Awareness of the diagnosis, risk factors (A-III)</p> <p>___ Commitment to comply with antibiotic treatment and laboratory request (A-III)</p>
Variations		<p>___ ultrasound or imaging studies if structural abnormality is entertained (A-II)</p> <p>___ culture and sensitivity bacterial if resistance is likely (A-II)</p>			

Visit	Pathway Tasks				Patient Outcomes
	History and Physical Examination	Laboratory	Pharmacologic Intervention	Non-pharmacologic Interventions	
Second Visit	___ Repeat history and physical examination focusing on the previous symptoms and findings and note for change (A-II)	___ No need for repeat urine dipstick or urinalysis (A-II)	___ Extend antibiotic treatment to 7 days if the symptoms improved but not completely resolved (A-I)	___ Increase fluid intake and avoidance of delay bladder emptying (A-II)  ___ Continuing discussion on risk factors (A-II)	___ Cure defined as resolution of symptoms and signs (A-I)
Variations		___ Urine culture, ultrasound or radiologic imaging may be warranted if symptoms persist or new evidence of complicated UTI or structural abnormality (A-II)			

Visit	Pathway Tasks				Patient Outcomes
	History and Physical Examination	Laboratory	Pharmacologic Intervention	Non-pharmacologic Interventions	
Continuing Visit	___ Some patients may have recurrent UTI and should undergo the same history and physical examination (A-II)	___ Urine culture to confirm the diagnosis and guide treatment (A-II)	___ Same antibiotics given for previous uncomplicated UTI or based on culture and sensitivity (A-I)	___ Increase fluid intake and avoidance of delay bladder emptying (A-II)  ___ Continuing discussion on risk factors (A-II)	___ Cure defined as resolution of symptoms and signs (A-I)
Variations					

## First Visit

### *History and Physical Examination*

Patients with UTI consult often with lower urinary tract symptoms like dysuria, increased urinary frequency, and

incontinence. Some come in with positive urinalysis result without symptoms i.e. asymptomatic bacteriuria, hematuria or leucocytosis. Urine leucocytosis, defined white blood cell count of >5 while microscopic hematuria is defined as >3 red blood cells per high power microscopic field may also be a manifestation of urinary tract infection.<sup>10</sup> Leukocytosis

usually refer to an infection while microscopic hematuria in adults may mean infection, malignancy, and urolithiasis.<sup>11</sup>

All patients should undergo a thorough clinical assessment based upon a comprehensive history focusing on the detailed evaluation of the presenting symptoms and physical examination. In a survey of 400 randomly selected family physicians, their decisions on how to manage UTI were based on the patient's history, physical examination and laboratory data. The clinical history and physical examination findings were given more weight than the laboratory results.<sup>12</sup> The physical examination may be normal or show flank or hypogastric tenderness. Even if the patient consulted for an incidental finding in the urinalysis, he should also undergo the same evaluation of clinical history and physical examination. This is to ensure that no other serious condition is overlooked. This will also rationally guide the laboratory tests that might be needed.<sup>13</sup>

If there are no indication of structural abnormality in the urinary tract or the symptoms do not totally impair the usual activity of daily living, the patient may be labelled as a case of uncomplicated urinary tract infection. Uncomplicated UTI is more common in women than in men. Aside from the anatomic difference, the risk factors for UTI in women include sexual intercourse, use of contraceptive diaphragms and, in postmenopausal women, mechanical and/or physiologic factors that affect bladder emptying such as cystocele or atrophic vaginitis. It is important to emphasize that women with uncomplicated UTI have a high risk of recurrence. Recurrent uncomplicated UTIs (defined as three or more episodes in 12 months or two or more episodes in 6 months) should be screened for an underlying urinary tract abnormality and other risk factors. A referral to urologist may be appropriate for some patients.<sup>14</sup>

Complicated UTI refers to UTI in patients with other chronic disease like diabetes, malignancy and urinary structure abnormality. In a cross-sectional study among diabetic patients aged 45 and above, the independent predictors for a complicated course were age above 60 years, chronic use of antibiotics, multiple physician contact, hospitalization in the previous year, renal disease and urinary incontinence. These predictors from medical history

can be used to accurately predict a complicated course of UTIs.<sup>15</sup> Complicated UTI may be caused by structural abnormalities of the urinary tract including malignancy especially among patients with hematuria. There is little information available to assist general practitioners (GPs) in deciding which patients with hematuria are likely to have a malignancy.<sup>16</sup>

Family physicians should also carefully manage uncomplicated UTI or asymptomatic bacteriuria in pregnant women. These conditions have been linked to an increased incidence of pyelonephritis, preeclampsia, hypertension, intrauterine growth retardation and premature delivery. Uterine contractions may be induced by cytokines and prostaglandins, which are released by microorganisms. Asymptomatic bacteriuria, gonococcal cervicitis and bacterial vaginosis are also strongly associated with preterm delivery. By adopting a rational approach to the diagnosis and treatment of genitourinary infections, family physicians can substantially decrease a patient's risk of preterm delivery.<sup>17</sup> Pyelonephritis and cystitis require different antibiotics and dosages in pregnant patients. Women with pre-existing renal disease usually do well during pregnancy if renal function is preserved and hypertension is not present.<sup>18</sup>

### *Laboratory Tests*

An initial assessment based upon a comprehensive history and physical examination should ensure that serious conditions are not overlooked and unnecessary laboratory studies are not performed. Clinical diagnosis can often indicate that the patient has an infection of the lower or the upper urinary tract. In some cases, the symptoms may be misleading, however.<sup>19</sup> Thus in family practice, urine dipstick test or urinalysis may be used in combination with symptoms and physical examination findings to diagnose uncomplicated urinary tract infection. The use of urine dipstick or urinalysis alone has some limitation.<sup>20</sup> For complicated UTI, the diagnostic tests may be a combination of urine analysis, culture and sensitivity, ultrasound or radiologic imaging and cystoscopy.<sup>16</sup>

The heterogeneity of the urine dipstick accuracy is an ongoing debate. However in a systematic review of 70 studies, the accuracy of urine dipstick was high in pregnant women, elderly people and urology patients. Sensitivity was highest in studies carried out in family medicine. The review suggested that urine dipstick test seems to be useful in all populations to exclude the presence of infection.<sup>21</sup>

C-reactive protein (CRP) is also a sensitive and non-specific inflammatory marker may complement the urine dipstick or urinalysis. Its use in general practice has been found to be valuable in adults with pneumonia, sinusitis and tonsillitis.<sup>22</sup> However, this should still be investigated among patients with UTI. Imaging studies like ultrasonography or scans do not appear to be helpful in uncomplicated urinary tract infections.<sup>23</sup> However, if there is a high index of suspicion for structural abnormality, ultrasound of the upper and lower urinary tract may be requested.

### Pharmacologic Interventions

Empirical antibiotics for uncomplicated urinary tract infection are justified if symptoms and physical examination findings are present and with positive urinary dipstick or urinalysis.<sup>24</sup> However, family physicians must evaluate their antibiotic prescription. Around 20 to 50 percent of antibiotic prescriptions in community settings are believed to be unnecessary. Family physicians must adjust their prescribing behavior to avoid bacterial resistance. Prescriptions for targeted-spectrum antibiotics can help prevent resistance. When available, local resistance data may be used to guide prescribing decisions.<sup>25</sup>

Prior to starting antibiotic treatment, it is recommended to review factors warranting antibiotic treatment. In a multiple regression analysis, five predictors have been identified: urgency/frequency, impaired daily activities, and positive dipstick test results for erythrocytes, leucocytes, and nitrite. These predictors had moderately good accuracy and could be the basis for a decision aid to starting antibiotic treatment.<sup>26</sup>

In this clinical pathway, the recommended drugs for uncomplicated UTI include nitrofurantoin, amoxicillin/

clavulanic acid and cefuroxime with a possible preference for nitrofurantoin. Fosfomycin may also be used for uncomplicated UTI in females.<sup>27-28</sup> This recommendation is supported in an open randomized trial comparing nitrofurantoin, trimethoprim or co-trimoxazole, cure rate was 87.2% of the patients treated with nitrofurantoin, 84.5% of the co-trimoxazole group and 86.5% of the trimethoprim group. The drugs were equally well tolerated.<sup>29</sup> In a survey of physicians in general internal medicine, family practice, obstetrics and gynecology, and emergency medicine, nitrofurantoin was the first choice for 46% of obstetricians, while over 80% in the other specialties chose trimethoprim-sulfamethoxazole.<sup>30</sup> A major consideration for this recommendation is the increasing resistance of *E. coli* to co-trimoxazole, ampicillin and ciprofloxacin.<sup>31</sup>

**Table 2.** Recommended antibiotics for the treatment of uncomplicated UTI.

Drug	Dose and Duration	Potential Side Effects
Nitrofurantoin	100 mg TID for 3-7 days	Hypersensitivity reaction, nausea and anorexia
Cefuroxime	250 mg BID for 7-10 days	Hypersensitivity reaction, anorexia, stomach cramps, diarrhea
Amoxicillin/ clavulanic acid	500/125 mg BID for 3-7 days	Gastrointestinal symptoms, electrolyte imbalance
Fosfomycin	3 g sachet dissolved in water as single dose	Diarrhea, nausea and vaginitis

The duration of therapy is normally three days. The three-day treatment recommendation is based on a randomized, controlled trial. There was no statistically significant difference in bacteriological cure rate found between the three-day and five-day regimen.<sup>32</sup> Since then, audits of prescription patterns in primary care showed 42% prescriptions written at the first visit were for 3 day courses

and found no significant increase in treatment failures among patients treated with the 3 day regimen.<sup>33</sup>

In pregnant women and in men with an infection of the lower urinary tract the duration of treatment should be 7-10 days. For pregnant women, nitrofurantoin is preferred. In men, amoxicillin/clavulanate, ciprofloxacin/ofloxacin, cotrimoxazole may be used. The duration of treatment should be 7-10 days.<sup>34</sup> Concerns about resistance have contributed to greater use of fluoroquinolones. But widespread use of this class of medications might promote resistance, hence fluoroquinolones should not be considered first-line therapy.<sup>35</sup>

When prescribing antibiotic, diligent advice to patients regarding compliance must be given since bacterial resistance is common with inappropriate use of antibiotics. In a meta-analysis of studies investigating subsequent antibiotic resistance in individuals prescribed with antibiotics in primary care, the pooled odds ratio (OR) for resistance was 2.5 (95% confidence interval 2.1 to 2.9) within 2 months of antibiotic treatment and 1.33 (1.2 to 1.5) within 12 months among patients with UTI. Studies reporting the quantity of antibiotics prescribed found that longer duration and multiple courses were associated with higher rates of resistance.<sup>36</sup>

As an alternative to antibiotic therapy, symptomatic treatment for pain or dysuria may be tried. In a pilot double-blind, randomized controlled pilot trial among patients with UTI, ibuprofen was compared with ciprofloxacin. At the end of treatment, 58.3% of patients in the ibuprofen-group were symptom-free versus 51.5% in the ciprofloxacin-group. During the treatment period, 33% of patients in the ibuprofen group compared to 18% in the ciprofloxacin group received secondary antibiotic treatment due to ongoing or worsening symptoms. Adverse event was noted among 32 ibuprofen group versus 26 in the ciprofloxacin group. The small differences in the outcome were not statistically significant.<sup>37</sup>

Asymptomatic bacteriuria or leucocytosis is usually transient and benign. While antimicrobial treatment is successful with symptomatic and uncomplicated urinary tract infection, consensus is still lacking as to asymptomatic

conditions. Correlations of bacteriuria with inflammation and symptoms may be necessary prior to considering antibiotic treatment.<sup>38</sup> Asymptomatic bacteriuria must be distinguished from symptomatic urinary tract infection by the absence of signs and symptoms compatible with UTI. Among men and non-pregnant women with asymptomatic bacteriuria it may be more appropriate to withhold antibiotics in situations in which bacteriuria is not significantly elevated. In this case, antimicrobial treatment may not be indicated.<sup>39</sup> Non-pharmacologic treatment may be given in these cases. Withholding antibiotic does not necessarily result to complication or recurrence. In a six months follow-up survey, the analyses showed no effect of antibiotic treatment on number of patients with recurrent UTI. Similarly, non-antibiotic treatment has no impact on recurrent UTI rates or pyelonephritis after day 28 and up to six months. The predictor for recurrent UTI was more on the previous history of UTI rather than initial antibiotic treatment.<sup>40</sup> Cranberry products may be also be of value in the prevention of recurrent urinary-tract infections.<sup>41</sup>

#### *Non-pharmacologic Interventions*

Although there is no strong evidence to support it, increased fluid intake and avoidance of delayed bladder emptying should be advised to both male and female patients. Discussion of risk factors and UTI prevention with the patient is also an important family physician's task. Risk factors for UTI in women include sexual intercourse, use of contraceptive diaphragms and, in postmenopausal women, mechanical and/or physiologic factors that affect bladder emptying such as cystocele or atrophic vaginitis.<sup>42</sup>

#### *Patient Outcomes*

At the end of the first visit, the patient must be aware of the diagnosis, risk factors and appropriate treatment. If antibiotic was prescribed, the patient must understand the importance of compliance and be aware of the risk of bacterial resistance. Family physicians should not



accommodate patient requests for unnecessary antibiotic prescription and should take steps to educate patients about the appropriate use of antibiotics.

## **Second Visit**

### *History and Physical Examination*

For uncomplicated UTI, it is expected that symptoms will resolve after 3 days of treatment. A repeat history and physical examination focusing on the previous symptoms and findings should be done. If the symptoms were not resolved, check for compliance to treatment. A complicated UTI may be considered if the symptoms fail to resolve despite compliance to treatment.

### *Laboratory Tests*

If the symptoms attributable to urinary tract infection were resolved, a repeat urine dipstick or urinalysis is not necessary. Further investigation like urine culture, ultrasound or radiologic imaging may be warranted if symptoms persist or new evidence of complicated UTI or structural abnormality was noted.

### *Pharmacologic Interventions*

Extending antibiotic treatment to 7 days may be done if the symptoms improved but not completely resolved. If the symptoms did not improve after 3-7 days of treatment, pharmacologic intervention may be guided by the results of culture and sensitivity or local antibiotic resistance data if available. Antibiotic resistance was once confined primarily to hospitals but is becoming increasingly prevalent in family practice settings.<sup>43</sup>

### *Patient Outcomes*

After 3-7 days of treatment, cure is defined as resolution of symptoms and signs attributable to UTI. Resolution of abnormalities of urine as shown by dipstick or urinalysis is

not necessarily part of the definition but may assist family physicians especially for complicated cases.

## **Continuing Visit**

### *History and Physical Examination*

Continuing visits in family practice may be seen among patients with recurrent UTI, typically defined as three or more UTIs within 12 months, or two or more occurrences within six months. (Arnold JJ, et al. 2016) It is common in women, including healthy women with normal genitourinary anatomy. The same bacterial species that caused previous infections are typically responsible for recurrences. In premenopausal women, sexual intercourse three or more times per week, spermicide use, new or multiple sex partners, and having a UTI before 15 years of age are established risk factors. In postmenopausal women, risk is primarily increased by lower estrogen levels. Episodes of recurrent UTI are typically characterized by dysuria and urinary frequency or hesitancy. Findings from the history or physical examination that suggest complicated infection or another disease process warrant additional evaluation.<sup>44</sup>

### *Laboratory Tests*

In patients with recurrent urinary tract infections, at least one symptomatic episode should be verified by urine culture to confirm the diagnosis and guide treatment. Imaging is not warranted unless structural abnormality is considered.<sup>44</sup>

### *Pharmacologic Interventions*

For the treatment of recurrent UTI, short courses of antibiotics are as effective as longer courses. The same antibiotics given for previous uncomplicated UTI may be used or based on culture and sensitivity. Self-medication may be tried by patients. It lowers the cost of diagnosis, number of physician visits, and number of symptomatic days compared with physician-initiated treatment. It also

reduces antibiotic exposure compared with antibiotic prophylaxis. Antibiotic prophylaxis effectively limits UTI recurrence but increases the risk of antibiotic resistance and adverse effects so it is not recommended. Cranberry products may reduce recurrent UTIs in premenopausal women, but data are conflicting.<sup>44</sup>

Recurrent urinary tract infections (UTIs) in otherwise healthy ambulatory women can be managed over the telephone. In a randomized controlled trial comparing care over the telephone or usual office-based care, there was no difference in symptom scores or patient satisfaction between the two methods of care.<sup>45</sup>

## Recommendations for Implementation

### *Clinic Level*

The PAFP QA Committee will disseminate the clinical pathways in a form of lectures and publications. Aside from the usual continuing medical education sessions, academic detailing by pharmacists to modify antibiotic prescribing may also be done. In one practice-based clinical trial, doctors in the academic detailing group prescribed more appropriately than the control group. The total cost of antibiotics prescribed by doctors in the control group was also higher than in the academic detailing group.<sup>46</sup> Lectures and publications must also be supplemented by generating evidence of actual practice by family physicians. At the clinic level, self-audit using the recommendations of this clinical pathway as the standard may be done. Passively delivered, complex interventions targeted at identified barriers to change had little effect in changing practice.<sup>47</sup>

To improve the patients' knowledge and expectations regarding antibiotic, patient information leaflets may also be tried. In a systematic review, patient information leaflets during consultations for common infections are promising tools to reduce antibiotic prescriptions. There was fewer re-consultations when patients are provided with a leaflet.<sup>48</sup>

### *Organizational Level*

The PAFP should establish a new model of quality improvement initiative where self-practice audits are included as part of the program. Within PAFP chapters, peer group discussions, individual feedback and quality improvement reports are the main components. This model has been shown to improve the care process for UTI in one randomized clinical trial. This trial showed that prescribing of first choice UTI drugs increased in the intervention group from but remained the same in the control group.<sup>50</sup>

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