Acute uncomplicated cystitis in women

Most urinary tract infections (UTIs) in women are acute uncomplicated cystitis caused by *Escherichia coli* (80%) (*E. coli*). Acute uncomplicated cystitis in women is defined as an uncomplicated lower UTI in a pre-menopausal, non-pregnant woman with no known urological abnormalities or comorbidities. Classical lower urinary tract symptoms include dysuria, urinary frequency, urgency and sometimes haematuria. Physical examination is typically normal or positive for suprapubic tenderness. A 2002 systematic review showed that in women who present with 1 or more symptoms of UTI, the probability of infection is approximately 50%. Specific combinations of symptoms (e.g. dysuria and frequency without vaginal discharge or irritation) raise the probability of UTI to more than 90%, effectively ruling in the diagnosis based on history alone. Family doctors should enquire about fever, flank pain, vaginal discharge, last menstrual period (LMP), and also patient's sexual history and past medical history (e.g. history of UTIs, diabetes mellitus, presence of indwelling urinary catheters, immunocompromised conditions, underlying urological abnormalities) which might be suggestive of a diagnosis other than simple bacterial cystitis (e.g. vaginitis, urethritis, structural urethral abnormalities, painful bladder syndrome (interstitial cystitis), pelvic inflammatory disease and nephrolithiasis).

Dipstick urinalysis, which is a simple and inexpensive test, can be useful to support the diagnosis if the clinical presentation is not typical. In women with uncomplicated UTI, urine dipstick results of either nitrite or leucocytes and blood had a sensitivity of 77% and a specificity of 70%; the negative predictive value of urine dipstick testing when nitrite, leucocytes, and blood are all negative was 73%; the positive predictive value for having nitrite and either blood or leucocytes was 92%. To avoid contamination, midstream urine specimen is used for testing.

Urine cultures are recommended for women who present with atypical symptoms, or symptoms that do not resolve or that recur within two to four weeks after the completion of treatment, and for women with suspected acute pyelonephritis. Similarly, to avoid contamination, midstream urine specimen is used for testing. A colony count greater than or equal to 10^3 colony-forming units per mL of an uropathogen is diagnostic of acute uncomplicated cystitis.

Given the very high probabilities of UTI based on classical symptoms, clinicians could consider empirical treatment without urine culture or dipstick urinalysis. Local antibiotic susceptibility patterns of *E. coli* in particular (refer to Antibiogram for Common Bacterial Isolates) should be considered in empirical antibiotic selection for uncomplicated cystitis. In addition, collateral damage is considered as important factor in making optimal treatment choices. Collateral damage, term describing ecological adverse effects of antimicrobial therapy, such as the selection of drug-resistant organisms and colonisation or infection with multidrug-resistant organisms, has been associated with use of broad spectrum cephalosporins and fluoroquinolones. Use of broad spectrum cephalosporins has been linked to subsequent infection with vancomycin-resistant enterococci, extended spectrum beta-lactamase producing *Klebsiella pneumoniae*, beta-lactam-resistant *Acinetobacter species*, and *Clostridium difficile*. Use of fluoroquinolones has been linked to infection with methicillin-resistant *Staphylococcus aureus* and with increasing fluoroquinolone resistance in gram-negative bacilli, such as *Pseudomonas aeruginosa*.

For the choice of antibiotic therapy (Table 1), nitrofurantoin is an appropriate choice for therapy due to low local resistance rate and is less likely to select drug-resistant organisms (The preserved in vitro susceptibility of *E. coli* to nitrofurantoin over many years of use suggests that it causes only minor collateral damage). Beta-lactam agents, including amoxicillin-clavulanate, cefuroxime are appropriate choices for therapy even if there is intermediate susceptibility because they are physiologically

concentrated in urine. Fluoroquinolones should be reserved for use in patients who have no other treatment options for acute uncomplicated cystitis because the risk of serious side effects (e.g. joint or tendon pain, muscle weakness, tingling or pricking sensation, numbness in the arms or legs, confusion, and hallucinations) generally outweighs the benefits. Sulfamethoxazole-trimethoprim is not recommended as the first line agent given the high local resistance. Antibiotic treatment is not required for asymptomatic bacteriuria except in pregnancy or before urological procedures for which mucosal bleeding is anticipated.

Table 1 Recommended antibiotic treatment for acute uncomplicated cystitis in women*

Drug (Route)	Dosage and Frequency (Usual)	Duration (Usual)	Remarks
First line			
Nitrofurantoin (oral)	50 mg four times daily	5-7 days	• Nitrofurantoin is an appropriate choice for therapy due to low local resistance rate and is less likely to select drug-resistant organisms. • It is contraindicated in patients with eGFR of less than 45 ml/minute.
Amoxicillin-clavulanate (oral)	250 mg/125 mg three times daily or 875 mg/125 mg twice daily	5-7 days	• Beta-lactam agents are appropriate choices for therapy even if there is intermediate susceptibility because they are physiologically concentrated in urine.
Second line			
Cefuroxime (oral)	500 mg twice daily	5-7 days	• Beta-lactam agents are appropriate choices for therapy even if there is intermediate susceptibility because they are physiologically concentrated in urine.
Levofloxacin (oral)	250 mg once daily	3 days	• Fluoroquinolones should be reserved for use in patients who have no other treatment options for acute uncomplicated cystitis because the risk of serious side effects (e.g. joint or tendon pain, muscle weakness, tingling or pricking sensation, numbness in the arms or legs, confusion, and hallucinations) generally outweighs the benefits.
Ciprofloxacin (oral)	250 mg twice daily	3 days	
Ofloxacin (oral)	200 mg twice daily	3 days	
Sulfamethoxazole-trimethoprim (oral)	960 mg twice daily	3 days	• Sulfamethoxazole-trimethoprim is not recommended as the first line agent given the high local resistance.

			• Beware of possible adverse reactions (e.g. skin rash).

*Clinicians should tailor make drug treatment based on clinical judgement. Definitive therapy should be based on microbiological and antibiotic sensitivity results if available.

Management of patients with infections should be personalised. Doctors should check, document and get patients well informed about antibiotic treatment (e.g. indication, side effect, allergy, contraindication, potential drug-drug interaction, etc.). They should be reminded to take antibiotics exactly as prescribed by their family doctors. If symptoms change, persist, or get worse, they should seek medical advice promptly.

References:

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Disclaimer:

This guidance notes is intended for medical professionals for reference only and is not intended to be prescriptive or a substitute for clinical judgement on management of individual patient. It is not a complete authoritative diagnostic or treatment guide. Medical professionals are recommended to obtain relevant information from other sources, and provide patient management based on clinical judgement.
This guidance notes will be kept updating thereafter. Please visit the website of Centre for Health Protection, Department of Health for the latest update and other information.
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