CURRENT CONCEPTS IN CYSTITIS: EPIDEMIOLOGY, PATHOGENESIS, AND CONTEMPORARY MANAGEMENT

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Abstract. Cystitis—the inflammation of the urinary bladder—remains one of the most common bacterial infections worldwide. Acute uncomplicated cystitis is usually caused by Escherichia coli, whereas complicated and recurrent forms involve a broader range of uropathogens and host factors. Recent guideline updates emphasise rising antimicrobial resistance, the need for antibiotic-sparing strategies, and individualised prevention. This three-page review synthesises the latest evidence on epidemiology, pathophysiology, clinical presentation, diagnostic criteria, and evidence-based treatment options, drawing on the 2024 European Association of Urology (EAU) and 2024 Infectious Diseases Society of America (IDSA) recommendations. Early recognition, appropriate antimicrobial stewardship, and patient-centred preventive measures are critical to reducing morbidity and healthcare costs associated with cystitis.

Key words: cystitis, urinary tract infection, Escherichia coli, antimicrobial resistance, nitrofurantoin, fosfomycin, recurrent UTI, bladder inflammation, diagnosis, prevention

Introduction. Cystitis accounts for >8 million outpatient visits annually and affects up to 60 % of women at least once in their lifetime. Despite its benign reputation, untreated or improperly managed infection can ascend to pyelonephritis, provoke urosepsis, or become chronic. Evolving resistance patterns among uropathogens challenge empirical therapy, necessitating regular guideline revision and clinician awareness.

*Pathophysiology & Microbiology***.** Most episodes are precipitated by ascending coliform bacteria originating from the gastrointestinal tract; E. coli possesses adhesins (P- and type-1 fimbriae) that facilitate urothelial attachment. Host factors—oestrogen deficiency, sexual activity, urinary stasis, catheterisation—compromise natural defences. Less common agents include Klebsiella spp., Staphylococcus saprophyticus, and, in complicated cases, Enterococcus faecalis or multidrug-resistant (MDR) Gram-negatives. Interstitial cystitis/bladder-pain syndrome involves non-infectious inflammatory pathways, mast-cell activation, and urothelial glycosaminoglycan layer defects.

A 2023 systematic review of 38 studies (n ≈ 1 million) estimated a global annual incidence of 1.1–3.7 % for symptomatic urinary tract infection, with highest rates in women aged 18-39 years. Pregnancy, diabetes mellitus, post-menopausal status, and

prior antibiotic exposure increase risk and recurrence. MDR uropathogens are emerging in community-acquired infections, particularly in regions with high fluoroquinolone and third-generation cephalosporin use.

*Clinical Presentation***.** Typical features include dysuria, urinary urgency and frequency, suprapubic discomfort, and cloudy or haematuric urine. Fever or flank pain raises suspicion for upper-tract involvement. In the elderly or catheterised patients, presentation may be atypical—new-onset delirium, urinary incontinence, or general decline.

Uncomplicated cystitis (female) Nitrofurantoin 100 mg BID 5 days Fosfomycin trometamol 3 g single dose; Trimethoprim-sulfamethoxazole 160/800 mg BID for 3 days if local resistance <20 %. Pregnancy Nitrofurantoin (avoid at ≥38 weeks), Amoxicillin-clavulanate 5-7 days Cephalexin 500 mg QID.

Lifestyle modification (fluid intake > 1.5 L/day, cranberries, D-mannose) shows modest benefit. Vaginal oestrogen cream reduces recurrence in post-menopausal women by restoring lactobacilli. Immunoprophylaxis (OM-89) demonstrates up to 34 % reduction in recurrences. Catheter management protocols—aseptic insertion, closed drainage, early removal—are essential in healthcare settings.

Conclusion. Cystitis continues to pose a substantial public-health burden, complicated by escalating antimicrobial resistance. Adherence to contemporary guidelines, culture-directed therapy, and preventive strategies can curtail recurrence and preserve antibiotic efficacy. Ongoing surveillance and research into novel therapeutics—phage therapy, microbiome modulation—are warranted to meet emerging challenges.

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