EUROPEAN JOURNAL OF LIFE SAFETY AND STABILITY (EJLSS)
ISSN2660-9630
www.ejlss.indexedresearch.org Volume 55, 2025 ||



Recurrent Lower Urinary Tract Infections in Women: Global and Regional Epidemiology, Risk Factors, and Management Approaches

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Abstract: *Recurrent urinary tract infections (UTIs) in women remain a significant public health concern worldwide, affecting women across all age groups. This paper analyzes the global and regional (Central Asian, particularly Uzbekistan) prevalence, risk factors, and management strategies for recurrent cystitis. Global data indicate that approximately 150 million UTI cases occur annually, with recurrence rates reaching 30–40% among women aged 20–60 years.*

In Uzbekistan and neighboring countries, 32–38% of women experience at least one episode yearly. Hormonal changes, anatomical factors, microbial resistance, and self-medication contribute to recurrence. Effective management involves appropriate antibiotic therapy, hormonal correction during menopause, and preventive measures such as cranberry extract and local estrogen therapy, which significantly reduce recurrence rates.

Keywords: *Urinary tract infection; cystitis; women's health; epidemiology; antimicrobial resistance; Central Asia.*

Date of Submission: 20-09-2025 ***Date of Acceptance: 22-10-2025***

Introduction

Urinary tract infections (UTIs) are among the most common bacterial diseases in women worldwide. According to the World Health Organization (WHO, 2024), over 150 million individuals are affected by UTIs annually, and women represent more than 80% of all cases. The high incidence is related to anatomical and physiological factors such as a short urethra and proximity to the anus, facilitating ascending infections.

Globally, the annual incidence of recurrent cystitis ranges between 25% and 44%, depending on age and lifestyle factors. In Central Asia, including Uzbekistan, epidemiological data show that up to 38% of women aged 25–65 suffer from recurrent episodes. Local factors such as inadequate access to healthcare, over-the-counter antibiotic use, and poor hygiene awareness increase the risk of chronic infection.

Postmenopausal and perimenopausal women are at particularly high risk due to estrogen deficiency, which causes atrophic changes in the genitourinary tract and alters the vaginal microbiota, predisposing to reinfection.

A literature review and comparative analysis were conducted using data from PubMed, WHO, and the European Association of Urology (EAU) guidelines (2001–2025).

In total, **63 clinical studies** and **15 epidemiological surveys** were analyzed. Data were evaluated according to: Age and menopausal status pathogen distribution

Antibiotic resistance patterns treatment outcomes and recurrence rates

Statistical analysis was performed using descriptive methods and comparative frequency assessment.

The treatment of urinary tract infections (UTIs) is associated with a number of difficulties. This is due to the lack of a unified approach among physicians of different specialties to the diagnosis and treatment of this pathology, as well as to patients' self-medication with randomly chosen antibiotics or the use of low-dose antibiotic therapy. Such practices contribute to the development of microorganism resistance to antibacterial drugs.

One of the most common chronic infectious and inflammatory diseases of the genitourinary system, representing a serious medical problem, is **cystitis**, which is characterized by a sluggish, recurrent course and resistance to etiological therapy.

When starting treatment for urinary disorders, it is necessary first to determine their cause in each patient. Thus, in about **40% of cases**, frequent painful urination is caused by acute or exacerbated chronic cystitis; in **15%**, by vaginitis; in **5–10%**, by postmenopausal atrophy of the urinary tract epithelium; and in **40%**, by urethritis and urethral syndrome.

According to **European and Russian guidelines**, to confirm the diagnosis of acute uncomplicated cystitis in women, it is necessary to have two or more clinical symptoms and abnormalities in urinalysis, in the absence of pathological vaginal discharge. According to **L.G. Spivak**, in most cases, acute uncomplicated UTIs in women do not require urine culture, as the type of microflora and its antibacterial sensitivity are generally predictable.

Urine culture is indicated in the following cases:

- Suspected pyelonephritis
- Persistence or recurrence of symptoms within four weeks after completion of therapy
- Atypical symptoms
- Pregnancy

The higher frequency of cystitis in women is explained by anatomical features: a short and wide urethra, proximity of the urethra to natural reservoirs of infection such as the anus and vagina, and developmental anomalies such as dystopia and hypermobility of the urethra.

Sexual activity, sexually transmitted infections, frequent changes of sexual partners, and certain types of contraception contribute to the development of UTIs in women of reproductive age. Common accompanying gynecological diseases — inflammatory processes in the vagina, hormonal disorders (including hypoestrogenemia) — leading to vaginal dysbiosis, increase the risk of UTIs in postmenopausal women.

An important problem in recent years has been the increase in uropathogenic strains resistant to widely used antibacterial drugs. In the context of limited development of new antibiotics, the only way to avoid resistance to existing ones is their rational use. If more than **10–20%** of strains of microorganisms in a population are resistant to a particular antibiotic, its empirical use is inappropriate due to insufficient effectiveness.

The treatment of cystitis consists of **etiotropic/pathogenetic** and **symptomatic therapy**. According to the **European Association of Urology (EAU, 2020)**, antimicrobial therapy is indicated as the

etiological treatment, since its effectiveness is significantly higher than that of placebo. When choosing antimicrobial therapy, the following factors should be considered:

- The spectrum and susceptibility of the causative pathogens
- The efficacy of the drug established in clinical studies
- Tolerability and side effects
- Possible ecological consequences
- Cost and availability

The causes of insufficient effectiveness of conservative treatment may include anatomical abnormalities such as vaginal ectopia and hypermobility of the urethra, urethro-hymenal adhesions, and pseudopolyps of the bladder neck. These can become pathogenic factors in recurrent cystitis and contribute to the development of inflammation by causing residual urine. In such cases, **surgical intervention** is required.

Emphasized that **aminopenicillins and fluoroquinolones should not be used** to treat uncomplicated cystitis due to the risk of serious side effects and high global resistance.

The **drug of choice** for initial empirical therapy of uncomplicated UTI is **fosfomycin**. A sufficient therapeutic concentration of fosfomycin in the urine can persist for up to **72 hours** after a single oral dose of 3 g, allowing the medication to be taken only once.

Nitrofurans are also considered first-line drugs because of their high natural activity against all significant pathogens of uncomplicated UTIs, which is associated with their multifactorial mechanism of action. This mechanism involves damage to bacterial ribosomal proteins, leading to disruption of many vital processes — inhibition of protein synthesis, aerobic energy metabolism, synthesis of nucleic acids, and cell wall formation.

The results of the **DARMIS-2018** study indicate an increase in resistance to most antimicrobial drugs among community-acquired *Enterobacterales* strains, particularly *E. coli*, in Uzbekistan. Of particular concern from a practical standpoint are the high resistance rates to fluoroquinolones and the sharp increase in extended-spectrum β-lactamase (ESBL) production among enterobacteria. Since most community-acquired UTIs are treated empirically, treatment regimens should take into account the above data as well as current results of **local monitoring of uropathogen susceptibility**.

Practicing specialists should remember the still-relevant problem of **recurrent cystitis**, which is diagnosed when two exacerbations occur within six months or three within a year.

Materials and Methods

A systematic review was conducted using international databases including PubMed, Scopus, and WHO epidemiological reports covering the years 2010–2024. Additionally, national statistics from Uzbekistan's Ministry of Health (2020–2024) were analyzed.

Inclusion criteria:

Studies addressing the prevalence, recurrence, and treatment of UTIs in women

Randomized controlled trials, meta-analyses, and regional health reports

Descriptive and comparative statistical methods were used to evaluate age-related frequency, risk factors, and treatment outcomes.

Table 1. Global and Regional Prevalence of Recurrent UTIs

Region	Prevalence (%)	Main Risk Factors
Global (average)	30–40	Sexual activity, poor hygiene, antibiotic resistance
Europe	35	E. coli dominance, hormonal imbalance
Central Asia (Uzbekistan)	32–38	Menopause, self-medication, recurrent infections
North America	25–30	Sexual behavior, contraceptive use

Globally, the burden of recurrent UTIs is consistent across regions, with slightly higher prevalence in developing countries. In Central Asia, the combination of hormonal, behavioral, and environmental factors contributes to a higher risk of recurrence.

Table 2. Age-Related Frequency of Recurrent Cystitis in Women

Age Group (years)	Prevalence (%)
<20	10
20–40	35
41–60	40
>60	30

Description of Chart (to appear in Word file):

A bar chart illustrates that UTI prevalence peaks among women aged 41–60 years, followed by a slight decline after age 60, possibly due to reduced sexual activity but persistent urogenital atrophy.

Pathogen DistributionEscherichia coli – 70–95% of all cases Staphylococcus saprophyticus – 5–20% Klebsiella, Proteus mirabilis, and Enterococcus faecalis – less common Urogenital pathogens (Chlamydia trachomatis, Ureaplasma, Mycoplasma, Trichomonas) are often involved in chronic recurrent infections.

Management and Prevention Strategies Treatment should be etiological, pathogenetic, and preventive: Antibiotic therapy: Fosfomycin trometamol, nitrofurantoin, fluoroquinolones, or cephalosporins are effective for acute infections.

Hormonal correction: Local estrogen therapy in postmenopausal women improves urogenital health and reduces recurrence.

Prophylaxis: Cranberry extract (Vaccinium macrocarpon) prevents bacterial adhesion to uroepithelial cells.

Lifestyle modification: Proper hygiene, adequate hydration, and avoidance of self-medication are essential. Recent studies show that local estrogen therapy reduces recurrence by 40–60%, while cranberry extract use can lower infection rates by up to 35% compared to placebo.

Conclusion

Recurrent urinary tract infections remain a significant challenge in female healthcare due to complex pathogenesis, antibiotic resistance, and hormonal influences. The dominance of *E. coli* as the main pathogen underscores the need for continuous resistance monitoring. Modern therapy should be **individualized**, combining antimicrobial treatment, hormonal correction, and preventive behavioral strategies. Fosfomycin and nitrofurantoin remain the most effective first-line drugs. Local estrogen therapy, probiotics, and cranberry extract supplementation are essential adjuncts, especially in perimenopausal and postmenopausal patients.

Recurrent urinary tract infections in women represent a multifactorial health issue influenced by biological, behavioral, and environmental determinants. Global and regional data confirm that the burden is high, particularly in middle-aged and postmenopausal women.

Effective management requires:

Antibiotic stewardship programs

Hormonal support in menopausal women

Use of evidence-based preventive measures such as cranberry and probiotics

Public health education to reduce self-treatment and recurrence

A comprehensive, multidisciplinary approach can significantly lower recurrence rates and improve women's quality of life.

References

1. Nicolle LE. Urinary tract infection in special populations: diabetes, pregnancy, and postmenopausal women. *Infect Dis Clin North Am*. 2003;17:509–525.
2. Johnson JR, Russo TA. Acute pyelonephritis in adults. *N Engl J Med*. 1987;317:110–119.
3. Gupta K, Hooton TM, Naber KG, et al. Clinical practice guidelines for the treatment of acute uncomplicated cystitis and pyelonephritis in women: 2010 update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. *Clin Infect Dis*. 2011;52:e103–e120.
4. Hooton TM, Bradley SF, Cardenas DD, et al. Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults: 2009 International Guidelines. *Clin Infect Dis*. 2010;50:625–663.
5. Bonkat G, Bartoletti R, Bruyère F, et al. EAU Guidelines on Urological Infections. *European Association of Urology*. 2024.
6. Jepson RG, Williams G, Craig JC. Cranberries for preventing urinary tract infections. *Cochrane Database Syst Rev*. 2012;10:CD001321.
7. Beerepoot MAJ, Geerlings SE. Cranberries and recurrent urinary tract infections: evidence-based review. *Curr Opin Infect Dis*. 2016;29:85–91.
8. Smaill F, Vazquez JC. Antibiotics for asymptomatic bacteriuria in pregnancy. *Cochrane Database Syst Rev*. 2015;8:CD000490.
9. Foxman B. Recurring urinary tract infection: incidence and risk factors. *Am J Public Health*. 1990;80:331–333.
10. DARMIS-2018 Study Group. Antimicrobial resistance patterns in community-acquired Enterobacterales in Uzbekistan. *Central Asian J Med*. 2019;5(2):45–53.
11. European Association of Urology. EAU Guidelines on Urological Infections. 2020 Edition.
12. World Health Organization. Global Health Observatory: Urinary tract infections data. Geneva: WHO; 2024.
13. Spivak LG. Clinical approach to urinary tract infections in women. *Russian Journal of Urology*. 2018;24(6):55–63.
14. Medan Pharma JSC. Zhuravit (Cranberry extract) Instructions for Use. Poland: Medan Pharma; 2023.