



## What is new in Urosepsis?

Recent updates in urosepsis management (2024–2025) emphasize a "6-hour window" for urological source control, a revised classification for "complicated" infections, and a new four-step framework for empiric antibiotic selection. Key shifts include prioritizing rapid decompression over antibiotic escalation and adopting shorter antimicrobial courses (7 days) for patients who stabilize.

### Actionable Summary for the Physician

- **Source Control (The 6-Hour Rule):** In critically ill urosepsis patients, urological intervention (e.g., nephrostomy, stent, or drainage) within 6 hours of disease onset is associated with a dramatic reduction in 28-day mortality (3.45% vs. 31.75% for delayed/no intervention).
- **Empiric Antibiotics:** Follow the IDSA 2025 Four-Step Approach: 1) Assess illness severity; 2) Evaluate resistance risk; 3) Consider patient-specific

contraindications; 4) Consult local antibiograms. For septic shock, aim for agents with >90% local susceptibility.

- **Revised Classification:** Complicated UTI (cUTI) is now defined by observable clinical signs (fever, chills, flank pain, obstruction, or urinary devices) rather than just underlying comorbidities like diabetes or age.
- **Treatment Duration:** Standardize to 7 days for most cUTIs/urosepsis cases (even with bacteremia) if clinical improvement is seen. Fluoroquinolones may be shortened to 5–7 days.[1]
- **Biomarkers:** Use Procalcitonin (PCT) and Heparin-Binding Protein (HBP) to distinguish systemic urosepsis from localized UTI and to guide early de-escalation.[1]

## Detailed Clinical Insights and Guidelines

### 1. Redefining Complicated UTI and Urosepsis (IDSA 2025/EAU 2024)

The IDSA 2025 Clinical Guidelines have overhauled the classification of "complicated" UTI. Previously, factors like male sex or controlled diabetes automatically categorized an infection as complicated. Now, the focus is on systemic manifestations:[1]

- **Complicated:** Presence of fever, chills, flank pain, CVA tenderness, urinary tract devices (catheters, stents), or documented urinary obstruction.
- **Uncomplicated:** Localized bladder symptoms (dysuria, frequency) in an afebrile patient, regardless of sex or age, provided no obstruction exists.[1]

### 2. The Critical Role of Early Source Control

Recent cohort studies (2024–2026) emphasize that antibiotic initiation alone is insufficient when an obstruction is present.

- **Decompression Timing:** Evidence suggests that for obstructive urosepsis (e.g., ureteral calculi), the timeliness of decompression is the most significant determinant of survival, outweighing the choice of diversion method (retrograde stent vs. percutaneous nephrostomy).

- **Mortality Impact:** A 2024 retrospective study found that urological source control within 6 hours was independently associated with survival, whereas antibiotic initiation within 1 hour—while still vital—did not show the same independent association with reduced mortality in the presence of uncorrected obstruction.

### 3. Updated Antimicrobial Stewardship and Empiric Selection

The IDSA 2025 and EAU 2024 updates provide specific thresholds for selecting empiric therapy based on local antibiograms:

- **Sepsis with Shock:** Select an agent where the local susceptibility for the suspected pathogen is  $\geq 90\%$ .
- **Sepsis without Shock:** Select an agent where local susceptibility is  $\geq 80\%$ .
- **Preferred Agents:** Third- or fourth-generation cephalosporins (ceftriaxone, cefepime), piperacillin-tazobactam, or carbapenems are preferred over newer agents (e.g., cefiderocol, plazomicin) for initial therapy unless multidrug-resistant organisms (MDROs) are confirmed.

### 4. New Focus on Fungal Urosepsis (EAU 2024)

The EAU 2024 Guidelines added a dedicated section (Section 3.17) on fungal urinary tract infections:

- **Management:** In septic patients with candiduria, the immediate removal or replacement of indwelling devices is mandatory, as antifungal penetration into biofilms is poor.
- **Therapy:** Fluconazole remains first-line for susceptible *Candida* species; echinocandins (e.g., caspofungin) are recommended for azole-resistant strains (e.g., *C. glabrata*) in the setting of urosepsis.

### 5. Emerging Diagnostic and Prognostic Tools

- **NEWS2 and SOFA:** The National Early Warning Score (NEWS2) is recommended by NICE and EAU for early risk stratification and has high sensitivity for identifying patients likely to deteriorate.
- **Machine Learning (ML):** New ML models (e.g., XGBoost) using variables such as age, sex, and urinalysis (WBC/RBC counts) are being validated to predict which outpatient UTIs are at the highest risk of progression to urosepsis.
- **Biomarkers:** Beyond CRP, Heparin-Binding Protein (HBP) has emerged as a superior marker for predicting the onset of sepsis-induced organ dysfunction in patients with febrile UTIs.

## References (1)

[1] [Simplified Diagnosis of Urosepsis by Emergency Ultrasound Combined with Clinical Scores and Biomarkers](#) Alice Nicoleta Dragoescu; Petru Octavian Dragoescu; Andreea Doriană Stanculescu; Vlad Padureanu; Dalia Dop; Mihai Alexandru Radu; Mirela Marinela Florescu; Daniela Teodora Maria; Dan Nicolae Florescu; George Mitroi, The Journal of Critical Care Medicine; Q1H-index: 2291 citations