

PeaceHealth Hospitals

Clinical decision support for Enterobacterales bacteremia from a urinary source.

Purpose: Provide treatment algorithms for patients with Enterobacterales bacteremia from urinary source at PeaceHealth hospitals, to encourage evidence-based practice and improve clinical outcomes.

Definitions:

AmpC Producer: *E. cloacae*, *K. aerogenes*, *C. freundii* (see separate [guideline](#) for details)

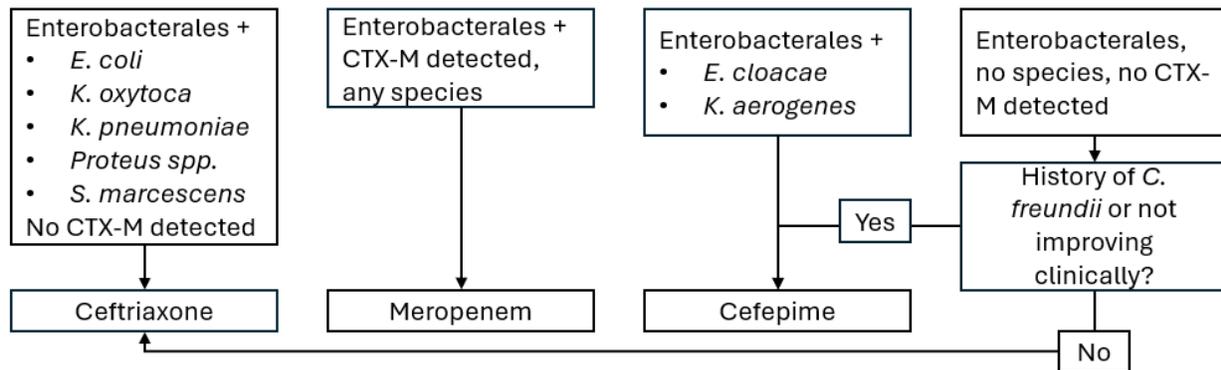
Extended spectrum beta-lactamase (ESBL) producer: *E. coli*, *K. pneumoniae*, *Proteus spp.* with non-susceptibility to ceftriaxone (see separate [guideline](#) for details)

Fever: 38°C or 100.4° F sustained over 1 hour OR an isolated temperature of 38.3° C or 100.9° F

Inclusion: recommendation for empiric treatment selection or adjustment

- Enterobacterales bacteremia from presumed urinary source, as identified by blood culture DNA identification panel (*Salmonella spp.* bacteremia treatment does not fall under the scope of this guide)
- Patient is hemodynamically stable (e.g. not requiring vasopressor therapy)

Initial treatment recommendations, with species identification but before susceptibility data:



Initial dosing strategies:

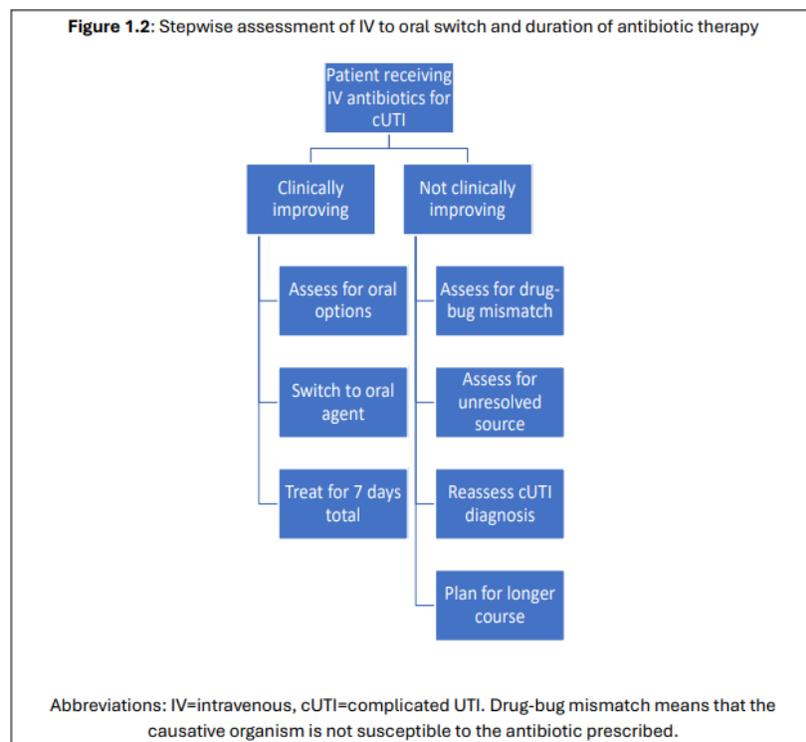
Antibiotic	Dose
Ceftriaxone	1g IV Q24 hours
Cefepime	1g IV infused over 3 hours Q8H
Meropenem	1g IV infused over 3 hours Q8H

2 g doses confer no added benefit for susceptible bacteremias and are associated with increased risk of toxicity. Renal dose adjustments and/or loading doses per pharmacy protocol where indicated.

Infectious diseases input recommended for true allergy to 3rd or 4th generation cephalosporins. See PH policy 18669558 for assessment of antibiotic allergy.

Repeat blood cultures are unnecessary in most patient who are improving clinically on antibiotic therapy. Consider repeat blood cultures for those with persistent fevers despite active therapy, concern for endovascular infection, retained intravascular catheters or other prosthetic devices, and those who have otherwise not clinically improved. Repeat blood cultures should not be obtained until at least 48 hours after initial blood cultures.

Process flow for assessment of response to therapy and definitive treatment:



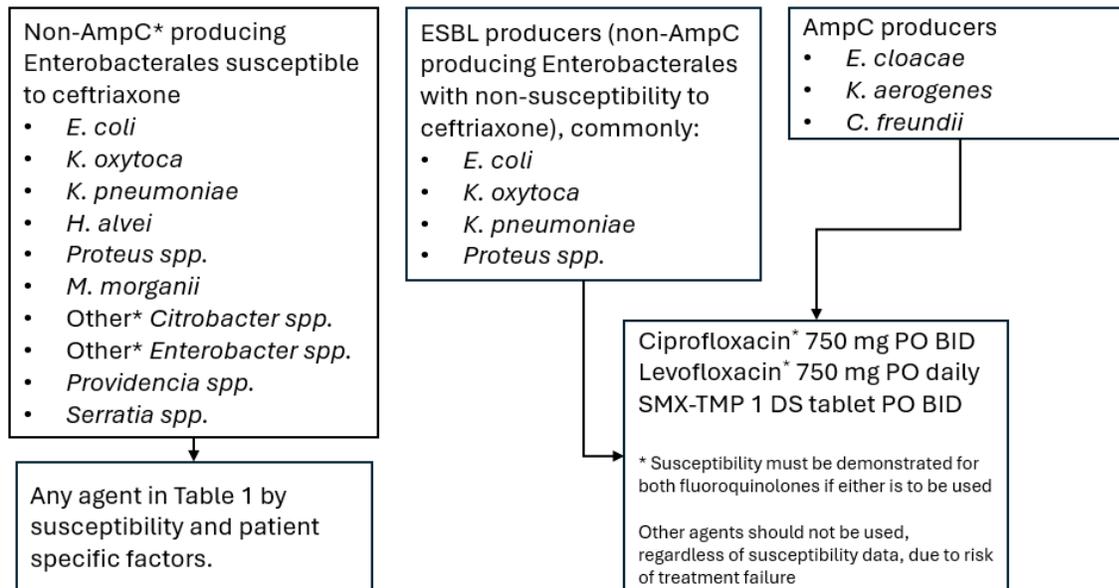
Inclusion: definitive treatment recommendation

- Patient is clinically improving
- No evidence of endovascular infection, osteomyelitis, central nervous system infection, prostatitis, epididymitis, orchitis, perinephric abscess, or retained prosthetic material at the site of infection
- Adequate source control has been achieved
- Culture and susceptibility data are available – patients with no oral options are still candidates for 7-day treatment course with an appropriate IV agent
- For oral (PO) treatment recommendations: patient is able to tolerate PO medications without concern for poor gastrointestinal absorption (see PH policy 17616473 for details)

Definitive treatment recommendations, with culture and susceptibility data:

Fluoroquinolones and SMX-TMP have high oral bioavailability but have less desirable side effect profiles when compared to oral β -lactams. The higher doses or oral beta lactams recommended in Table 1 are expected to reach pharmacokinetic targets. Multiple recent studies demonstrate no significant difference in recurrence of bacteremia or mortality between high-dose β -lactams, SMX-TMP, and oral fluoroquinolones for gram negative bacteremia.

Selection of oral agent for stepdown treatment:



Nitrofurantoin, fosfomycin, or any tetracycline should never be used for bloodstream infections.

If no oral options are available, consider infectious diseases input for coordination of IV antibiotics to complete 7 days.

Table 1: Oral agent and dosages for stepdown treatment

Antibiotic	Dose	Notes
Amoxicillin	1 g PO three times daily	Infer from ampicillin susceptibility. 80% bioavailability.
Amoxicillin-clavulanate	875 mg PO twice daily	80% bioavailability
Cephalexin	1000 mg PO three times daily	90% bioavailability
Cefadroxil	1000 mg PO twice daily	90% bioavailability. For outpatient use only if included on partner (KP) formulary

Renal adjustment per pharmacy protocol as indicated

Alternative oral agent and dosages for stepdown treatment

SMX-TMP	800 mg-160 mg (DS) PO twice daily	80% bioavailability. Avoid where alternatives are available in patients with impaired renal function.
Ciprofloxacin	500 mg PO twice daily AmpC or ESBL producers: 750 mg PO twice daily	70% bioavailability. Avoid where alternatives are available in elderly patients, those with cardiac comorbidities, or risk of aortic aneurysm. Susceptibility must be demonstrated to all tested fluoroquinolones prior to use.

Renal adjustment per pharmacy protocol as indicated

Secondary alternative oral agent and dosages for stepdown treatment

Cefpodoxime	200 mg PO twice daily	Lower bioavailability (50%) compared with other listed beta lactams
Levofloxacin	750 mg PO once daily	~85% bioavailability. Avoid where alternatives are available in elderly patients, those with cardiac comorbidities, or risk of aortic aneurysm. Susceptibility must be demonstrated to all tested fluoroquinolones prior to use.

Renal adjustment per pharmacy protocol as indicated

Duration of treatment:

7-day treatment duration is recommended for most Enterobacterales bacteremia and is preferred over longer courses. Day 0 is classified as the initiation of active treatment or source control, whichever is later.

Treatment duration of multi-drug-resistant (MDR) pathogens is identical to that of susceptible pathogens, as long as preferred treatment is used.

Special circumstances: consider infectious diseases consultation for total duration of treatment for retained prosthetic material at the site of infection, uncertainty regarding infectious source control, or other unique clinical circumstance.

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