

Table 1. Suggested dosing of antibiotics for the treatment of infections caused by antimicrobial-resistant organisms

Agent	Adult Dosage (assuming normal renal and liver function)	Target Organisms ^{b,c}
Amikacin	Cystitis: 15 mg/kg/dose ^c IV once All other infections: 20 mg/kg/dose ^d IV x 1 dose, subsequent doses and dosing interval based on pharmacokinetic evaluation	ESBL-E, AmpC-E, CRE, DTR- <i>P. aeruginosa</i>
Ampicillin-sulbactam	9 g IV q8h over 4 hours OR 27 g IV q24h as a continuous infusion For mild infections caused by CRAB isolates susceptible to ampicillin-sulbactam, it is reasonable to administer 3g IV q4h – particularly if intolerance or toxicities preclude the use of higher dosages.	CRAB
Cefepime	Cystitis: 1 g IV q8h All other infections: 2 g IV q8h, infused over 3 hours	AmpC-E (with cefepime MICs ≤2 mcg/mL)
Cefiderocol	2 g IV q8h, infused over 3 hours	CRE, DTR- <i>P. aeruginosa</i> , CRAB, <i>S. maltophilia</i>
Ceftazidime-avibactam	2.5 g IV q8h, infused over 3 hours	CRE, DTR- <i>P. aeruginosa</i>
Ceftazidime-avibactam and aztreonam	Ceftazidime-avibactam: 2.5 g IV q8h, infused over 3 hours <u>PLUS</u> Aztreonam: 2 g IV q8h, infused over 3 hours, at the same time as ceftazidime-avibactam	Metallo-β-lactamase-producing CRE, <i>S. maltophilia</i>
Ceftolozane-tazobactam	Cystitis: 1.5 g IV q8h, infused over 1 hour All other infections: 3 g IV q8h; infused over 3 hours	DTR- <i>P. aeruginosa</i>
Ciprofloxacin	ESBL-E or AmpC infections: 400 mg IV q8h-q12h OR 500 – 750 mg PO q12h DTR-<i>P. aeruginosa</i>, pneumonia: 400 mg IV q8h OR 750 mg PO q12h	ESBL-E, AmpC-E
Colistin	Refer to international consensus guidelines on polymyxins ^e	CRE cystitis, DTR- <i>P. aeruginosa</i> cystitis, CRAB cystitis
Eravacycline	1 mg/kg/dose IV q12h	CRE, CRAB, <i>S. maltophilia</i>
Ertapenem	1 g IV q24h, infused over 30 minutes	ESBL-E, AmpC-E

IDSA Guidance on the Treatment of Antimicrobial Resistant Gram-Negative Infections: Version 2.0

AmpC-E, CRAB, and *Stenotrophomonas maltophilia* Infections

Agent	Adult Dosage (assuming normal renal and liver function)	Target Organisms ^{b,c}
Fosfomycin	Cystitis: 3 g PO x 1 dose	ESBL- <i>E. coli</i> cystitis
Gentamicin	Cystitis: 5 mg/kg/dose ^c IV once All other infections: 7 mg/kg/dose ^d IV x 1 dose, subsequent doses and dosing interval based on pharmacokinetic evaluation	ESBL-E, AmpC-E, CRE, DTR- <i>P. aeruginosa</i>
Imipenem-cilastatin	Cystitis (standard infusion): 500 mg IV q6h, infused over 30 minutes All other infections (extended-infusion): 500 mg IV q6h; infused over 3 hours	ESBL-E, AmpC-E, CRE, CRAB
Imipenem-cilastatin-relebactam	1.25 g IV q6h, infused over 30 minutes	CRE, DTR- <i>P. aeruginosa</i>
Levofloxacin	750 mg IV/PO q24h	ESBL-E, AmpC-E, <i>S. maltophilia</i>
Meropenem	Cystitis (standard infusion): 1 g IV q8h All other ESBL-E or AmpC-E infections: 1-2 g IV q8h, can consider a 3-hour infusion All other CRE and CRAB infections: 2 g IV q8h, infused over 3 hours	ESBL-E, AmpC-E, CRE, CRAB
Meropenem-vaborbactam	4 g IV q8h, infused over 3 hours	CRE
Minocycline	200 mg IV/PO q12h	CRAB, <i>S. maltophilia</i>
Nitrofurantoin	Cystitis: Macrocrystal/monohydrate (Macrobid®) 100 mg PO q12h Cystitis: Oral suspension: 50 mg q6h	ESBL-E cystitis, AmpC-E cystitis
Plazomicin	Cystitis: 15 mg/kg ^d IV x 1 dose All other infections: 15 mg/kg ^c IV x 1 dose, subsequent doses and dosing interval based on pharmacokinetic evaluation	ESBL-E, AmpC-E, CRE, DTR- <i>P. aeruginosa</i>
Polymyxin B	Refer to international consensus guidelines on polymyxins ^e	DTR- <i>P. aeruginosa</i> , CRAB
Tigecycline	200 mg IV x 1 dose, then 100 mg IV q12h	CRE, CRAB, <i>S. maltophilia</i>

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AmpC-E, CRAB, and *Stenotrophomonas maltophilia* Infections

Agent	Adult Dosage (assuming normal renal and liver function)	Target Organisms ^{b,c}
Tobramycin	Cystitis: 5 mg/kg/dose ^d IV x 1 dose All other infections: 7 mg/kg/dose ^d IV x 1 dose; subsequent doses and dosing interval based on pharmacokinetic evaluation	ESBL-E, AmpC-E, CRE, DTR- <i>P. aeruginosa</i>
Trimethoprim-sulfamethoxazole	Cystitis: 160 mg (trimethoprim component) IV/PO q12h Other infections: 8-12 mg/kg/day (trimethoprim component) IV/PO divided q8-12h (consider maximum dose of 960 mg trimethoprim component per day)	ESBL-E, AmpC-E, <i>S. maltophilia</i>

AmpC-E: ApmC β -lactamase-producing Enterobacterales; **CRAB:** Carbapenem-resistant *Acinetobacter baumannii*; **CRE:** Carbapenem-resistant Enterobacterales; **DTR-*P. aeruginosa*:** *Pseudomonas aeruginosa* with difficult-to-treat resistance; ***E. coli*:** *Escherichia coli*; **ESBL-E:** Extended-spectrum β -lactamase-producing Enterobacterales; **IV:** Intravenous; **MIC:** Minimum inhibitory concentration; **PO:** By mouth; **q4h:** Every 4 hours; **q6h:** Every 6 hours; **q8h:** Every 8 hours; **q12h:** Every 12 hours; **q24h:** Every 24 hours; ***S. maltophilia*:** *Stenotrophomonas maltophilia*

Explanations/References

- Dosing suggested for several agents differs from U.S. Food and Drug Administration-recommended dosing.
- Target organisms limited to the following organisms and generally only after susceptibility has been demonstrated: ESBL-E, AmpC-E, CRE, DTR-*P. aeruginosa*, CRAB, and *Stenotrophomonas maltophilia*.
- For additional guidance on the treatment of ESBL-E, CRE, and DTR-*P. aeruginosa*, refer to: <https://www.idsociety.org/practice-guideline/amr-guidance/>.
- Use adjusted body weight for patients >120% of ideal body weight for aminoglycoside dosing.
- Tsuji BT, Pogue JM, Zavascki AP, et al. International Consensus Guidelines for the Optimal Use of the Polymyxins: Endorsed by the American College of Clinical Pharmacy (ACCP), European Society of Clinical Microbiology and Infectious Diseases (ESCMID), Infectious Diseases Society of America (IDSA), International Society for Anti-infective Pharmacology (ISAP), Society of Critical Care Medicine (SCCM), and Society of Infectious Diseases Pharmacists (SIDP). *Pharmacotherapy* **2019**; 39(1): 10-39.