

Breakpoints Eliminated from CLSI document M100 Since 2010

Antimicrobial Agent	Disk Content	Interpretive Categories and Zone Diameter Breakpoints, nearest whole mm			Interpretive Categories and MIC Breakpoints, µg/mL			M100 Edition in Which Breakpoints Were Last Included/Comments	Rationale
		S	I	R	S	I	R		
Enterobacteriaceae									
Cephalothin (surrogate test for uncomplicated UTI)	30 µg	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32	M100-S25	Cefazolin is a more reliable surrogate than cephalothin for predicting results for oral cephalosporins that might be used for treatment of uncomplicated UTIs.
Nalidixic acid	30 µg	≥ 19	14-18	≤ 13	≤ 16	-	≥ 32	M100S, 26th ed. Deleted for <i>Salmonella</i> spp. only	Nalidixic acid does not perform reliably in predicting susceptibility to fluoroquinolones that might be used for treatment of <i>Salmonella</i> infections. It has been shown to produce both false-resistant and false-susceptible results. ^{1,2}
Norfloxacin	10 µg	≥ 17	13-16	≤ 12	≤ 4	8	≥ 16	M100, 28th ed.	This agent is no longer available.
Ticarcillin	75 µg	≥ 20	15-19	≤ 14	≤ 16	32-64	≥ 128	M100-S25	This agent is no longer available.
Pseudomonas aeruginosa									
Cefoperazone	75 µg	≥ 21	16-20	≤ 15	≤ 16	32	≥ 64	M100-S20	These agents are no longer available or have limited indications for <i>P. aeruginosa</i> .
Cefotaxime	30 µg	≥ 23	15-22	≤ 14	≤ 8	16-32	≥ 64	M100-S20	
Ceftizoxime	30 µg	≥ 20	15-19	≤ 14	≤ 8	16-32	≥ 64	M100-S20	
Ceftriaxone	30 µg	≥ 21	14-20	≤ 13	≤ 8	16-32	≥ 64	M100-S20	
Moxalactam	30 µg	≥ 23	15-22	≤ 14	≤ 8	16-32	≥ 64	M100-S20	
Norfloxacin	10 µg	≥ 17	13-16	≤ 12	≤ 4	8	≥ 16	M100, 28th ed.	
Ticarcillin	75 µg	≥ 24	16-23	≤ 15	≤ 16	32-64	≥ 128	M100-S25	
Acinetobacter spp.									
Mezlocillin	75 µg	≥ 21	18-20	≤ 17	≤ 16	32-64	≥ 128	M100-S25	These agents are no longer available.
Ticarcillin	75 µg	≥ 20	15-19	≤ 14	≤ 16	32-64	≥ 128	M100-S25	
Other Non-Enterobacteriaceae									
Carbenicillin	N/A	-	-	-	≤ 16	32	≥ 64	M100-S25	These agents are no longer available.
Mezlocillin	N/A	-	-	-	≤ 16	32-64	≥ 128		
Ticarcillin	N/A	-	-	-	≤ 16	32-64	≥ 128		
Norfloxacin	N/A	-	-	-	≤ 4	8	≥ 16	M100, 28th ed.	
Staphylococcus spp.									
Oxacillin (<i>S. aureus</i> / <i>S. lugdunensis</i>)	1 µg	≥ 13	11-12	≤ 10	-	-	-	M100-S22	Oxacillin disk diffusion performance is inferior to that of cefoxitin for detection of <i>mecA</i> -mediated oxacillin resistance.

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Staphylococcus spp. (Continued)									
Amoxicillin-clavulanate	20/10 µg	≥ 20	-	≤ 19	≤ 4/2	-	≥ 8/4	M100-S22	There are limited data available to demonstrate the predictive value of testing these β-lactam agents against staphylococci. Consequently, susceptibility results for antistaphylococcal β-lactams other than penicillin and oxacillin (cefoxitin) are best determined by deducing results from testing penicillin and oxacillin (cefoxitin). An exception is for ceftaroline, which must be tested if ceftaroline results are requested. ³
Ampicillin-sulbactam	10/10 µg	≥ 15	12-14	≤ 11	≤ 8/4	16/8	≥ 32/16		
Piperacillin-tazobactam	100/10 µg	≥ 18	-	≤ 17	≤ 8/4	-	≥ 16/4		
Ticarcillin-clavulanate	75/10 µg	≥ 23	-	≤ 22	≤ 8/2	-	≥ 16/2		
Cefaclor	30 µg	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32		
Cefamandole	30 µg	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32		
Cefazolin	30 µg	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32		
Cefepime	30 µg	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32		
Cefdinir	5 µg	≥ 20	17-19	≤ 16	≤ 1	2	≥ 4		
Cefmetazole	30 µg	≥ 16	13-15	≤ 12	≤ 16	32	≥ 64		
Cefonicid	30 µg	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32		
Cefoperazone	75 µg	≥ 21	16-20	≤ 15	≤ 16	32	≥ 64		
Cefotaxime	30 µg	≥ 23	15-22	≤ 14	≤ 8	16-32	≥ 64		
Cefotetan	30 µg	≥ 16	13-15	≤ 12	≤ 16	32	≥ 64		
Cefpodoxime	10 µg	≥ 21	18-20	≤ 17	≤ 2	4	≥ 8		
Cefprozil	30 µg	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32		
Ceftazidime	30 µg	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32		
Ceftizoxime	30 µg	≥ 20	15-19	≤ 14	≤ 8	16-32	≥ 64		
Ceftriaxone	30 µg	≥ 21	14-20	≤ 13	≤ 8	16-32	≥ 64		
Cefuroxime (oral)	30 µg	≥ 23	15-22	≤ 14	≤ 4	8-16	≥ 32		
Cefuroxime (parenteral)	30 µg	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32		
Cephalothin	30 µg	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32		
Loracarbef	30 µg	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32		
Moxalactam	30 µg	≥ 23	15-22	≤ 14	≤ 8	16-32	≥ 64		
Doripenem	10 µg	≥ 30	-	-	≤ 0.5	-	-		
Ertapenem	10 µg	≥ 19	16-18	≤ 15	≤ 2	4	≥ 8		
Imipenem	10 µg	≥ 16	14-15	≤ 13	≤ 4	8	≥ 16		
Meropenem	10 µg	≥ 16	14-15	≤ 13	≤ 4	8	≥ 16		
Norfloxacin	10 µg	≥ 17	13-16	≤ 12	≤ 4	8	≥ 16	M100, 28th ed.	This agent is no longer available.
Amikacin	30 µg	≥ 17	15-16	≤ 14	≤ 16	32	≥ 64	M100, 27th ed.	According to current guidelines, if an aminoglycoside is warranted, only gentamicin in combination with another active drug should be used for treatment of methicillin-resistant staphylococcal infections; none of these other aminoglycosides should be considered.
Kanamycin	30 µg	≥ 18	14-17	≤ 13	≤ 16	32	≥ 64		
Netilmicin	30 µg	≥ 15	13-14	≤ 12	≤ 8	16	≥ 32		
Tobramycin	10 µg	≥ 15	13-14	≤ 12	≤ 4	8	≥ 16		
Telithromycin	15 µg	≥ 22	19-21	≤ 18	≤ 1	2	≥ 4	M100, 28th ed.	This agent is no longer available.

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		S	I	R	S	I	R		
Enterococcus spp.									
Norfloxacin	10 µg	≥ 17	13-16	≤ 12	≤ 4	8	≥ 16	M100, 28th ed.	This agent is no longer available.
Anaerobes									
Mezlocillin	N/A	-	-	-	≤ 32	64	≥ 128	M100-S25	These agents are no longer available.
Ticarcillin	N/A	-	-	-	≤ 32	64	≥ 128		
Haemophilus influenzae and Haemophilus parainfluenzae									
Telithromycin	15 µg	≥ 15	12-14	≤ 11	≤ 4	8	≥ 16	M100, 28th ed.	This agent is no longer available.
Neisseria gonorrhoeae									
Cefuroxime	30 µg	≥ 31	26-30	≤ 25	≤ 1	2	≥ 4	M100, 28th ed.	These agents currently have no role in the management of gonococcal infections. They are not on the list of recommended treatments, in contemporary treatment guidelines for uncomplicated infections, or for special situations.
Cefmetazole	30 µg	≥ 33	28-32	≤ 27	≤ 2	4	≥ 8		
Ceftazidime	30 µg	≥ 31	-	-	≤ 0.5	-	-		
Cefetamet	10 µg	≥ 29	-	-	≤ 0.5	-	-		
Enoxacin	10 µg	≥ 36	32-35	≤ 31	≤ 0.5	1	≥ 2		
Fleroxacin	5 µg	≥ 35	29-34	≤ 28	≤ 0.25	0.5	≥ 1		
Lomefloxacin	10 µg	≥ 38	27-37	≤ 26	≤ 0.12	0.25-1	≥ 2		
Ofloxacin	5 µg	≥ 31	25-30	≤ 24	≤ 0.25	0.5-1	≥ 2		
Streptococcus pneumoniae									
Telithromycin	15 µg	≥ 19	16-18	≤ 15	≤ 1	2	≥ 4	M100, 28th ed.	This agent is no longer available.

Abbreviations: I, intermediate; MIC, minimal inhibitory concentration; R, resistant; S, susceptible; UTI, urinary tract infection.

References

- ¹ Deak E, Skov R, Hindler JA, Humphries RM. Evaluation of surrogate disk tests for detection of ciprofloxacin and levofloxacin resistance in clinical isolates of *Salmonella enterica*. *J Clin Microbiol*. 2015;53(11):3405-3410.
- ² Skov R, Matuschek E, Sjölund-Karlsson M, et al. Development of a pefloxacin disk diffusion method for detection of fluoroquinolone-resistant *Salmonella enterica*. *J Clin Microbiol*. 2015;53(11):3411-3417.
- ³ Dien Bard J, Hindler JA, Gold HS, Limbago B. Rationale for eliminating *Staphylococcus* breakpoints for B-lactam agents other than penicillin, oxacillin or ceftoxitin, and ceftaroline. *Clin Infect Dis*. 2014;58(9):1287-1296.