

## 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		
<b>Enterobacteriaceae</b>									
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. <sup>1,2</sup>
Ticarcillin	75 µg	≥ 20	15-19	≤ 14	≤ 16	32-64	≥ 128	M100-S25	This agent is no longer available.
<b>Pseudomonas aeruginosa</b>									
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	
Ticarcillin	75 µg	≥ 24	16-23	≤ 15	≤ 16	32-64	≥ 128	M100-S25	
<b>Acinetobacter spp.</b>									
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	
<b>Other Non-Enterobacteriaceae</b>									
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		
<b>Staphylococcus spp.</b>									
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.
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. <sup>3</sup>
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		

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		S	I	R	S	I	R				
<b>Staphylococcus spp. (Continued)</b>											
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				
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				
<b>Anaerobes</b>											
Mezlocillin	N/A	-	-	-	≤ 32	64	≥ 128	M100-S25	These agents are no longer available.		
Ticarcillin	N/A	-	-	-	≤ 32	64	≥ 128				

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

### References

- 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.
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- Dien Bard J, Hindler JA, Gold HS, Limbago B. Rationale for eliminating *Staphylococcus* breakpoints for β-lactam agents other than penicillin, oxacillin or ceftoxitin, and ceftaroline. *Clin Infect Dis*. 2014;58(9):1287-1296.