Breakpoints Archived 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		
Enterobacterales									
Cephalothin (surrogate test for uncomplicated UTI)	30 µg	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32	January 2015 (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	January 2016 (M100S, 26th ed.) Deleted for *Salmonella* spp. only	Nalidixic acid does not perform reliably in predicting susceptibility to fluoroquinolones that might be used for treatment of *Salmonella* infections. It has been shown to produce both false-resistant and false-susceptible results.[1,2]
Piperacillin	100 µg	≥ 21	18-20	≤ 17	-	-	-	March 2021 (M100-Ed31)	Disk diffusion breakpoints deleted because disk correlates for revised MIC breakpoints were reassessed.
Ticarcillin	75 µg	≥ 20	15-19	≤ 14	≤ 16	32-64	≥ 128	January 2015 (M100-S25)	This agent is no longer available.
Pseudomonas aeruginosa									
Cefoperazone	75 µg	≥ 21	16-20	≤ 15	≤ 16	32	≥ 64	January 2010 (M100-S20)	These agents are no longer available or have limited indications for *P. aeruginosa*.
Cefotaxime	30 µg	≥ 23	15-22	≤ 14	≤ 8	16-32	≥ 64	January 2010 (M100-S20)	
Ceftizoxime	30 µg	≥ 20	15-19	≤ 14	≤ 8	16-32	≥ 64	January 2010 (M100-S20)	
Ceftriaxone	30 µg	≥ 21	14-20	≤ 13	≤ 8	16-32	≥ 64	January 2010 (M100-S20)	
Gentamicin	10 µg	≥ 15	13-14^	≤ 12	≤ 4	8^	≥ 16	February 2022 (M100-Ed32)	
Moxalactam	30 µg	≥ 23	15-22	≤ 14	≤ 8	16-32	≥ 64	January 2010 (M100-S20)	
Ticarcillin	75 µg	≥ 24	16-23	≤ 15	≤ 16	32-64	≥ 128	January 2015 (M100-S25)	
***Acinetobacter* spp.**									
Doxycycline	30 µg	≥ 13	10-12	≤ 9	≤ 4	8	≥ 16	February 2024 (M100-Ed34)	MIC and disk diffusion breakpoints were removed based on data showing that 2 CLSI reference AST methods, BMD and AD, do not correlate.
Mezlocillin	75 µg	≥ 21	18-20	≤ 17	≤ 16	32-64	≥ 128	January 2015 (M100-S25)	This agent is no longer available.
Tetracycline	30 µg	≥ 15	12-14	≤ 11	≤ 4	8	≥ 16	February 2024 (M100 Ed-34)	MIC and disk diffusion breakpoints were removed based on data showing that 2 CLSI reference AST methods, BMD and AD, do not correlate.
Ticarcillin	75 µg	≥ 20	15-19	≤ 14	≤ 16	32-64	≥ 128	January 2015 (M100-S25)	This agent is no longer available.

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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		
***Burkholderia cepacia* Complex**									
Ceftazidime	30 µg	≥ 21	18-20	≤ 17	≤ 8	16	≥ 32	March 2023 (M100-Ed33) (disk diffusion) February 2024 (M100-Ed34) (MIC)	MIC and disk diffusion breakpoints were removed based on data showing that 2 CLSI reference AST methods, BMD and AD, do not correlate.
Chloramphenicol	-	-	-	-	≤ 8	16	≥ 32		
Levofloxacin	-	-	-	-	≤ 2	4	≥ 8		
Meropenem	10 µg	≥ 20	16-19	≤ 15	≤ 4	8	≥ 16		
Minocycline	30 µg	≥ 19	15-18	≤ 14	≤ 4	8	≥ 16		
Ticarcillin-clavulanate	-	-	-	-	≤ 16/2	32/2-64/2	≥ 128/2		
Trimethoprim-sulfamethoxazole	1.25/23.75 µg	≥ 16	11-15	≤ 10	≤ 2/38	-	≥ 4/76		
Stenotrophomonas maltophilia									
Ceftazidime	-	-	-	-	≤ 8	16	≥ 32	March 2023 (M100-Ed33)	MIC breakpoints were removed due to limited PK/PD studies and other data used when the breakpoint was established.
Other Non-Enterobacterales									
Carbenicillin	N/A	-	-	-	≤ 16	32	≥ 64	January 2015 (M100-S25)	These agents are no longer available.
Mezlocillin	N/A	-	-	-	≤ 16	32-64	≥ 128		
Ticarcillin	N/A	-	-	-	≤ 16	32-64	≥ 128		
***Staphylococcus* spp.**									
Amikacin	30 µg	≥ 17	15-16	≤ 14	≤ 16	32	≥ 64	January 2017 (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.
Amoxicillin-clavulanate	20/10 µg	≥ 20	-	≤ 19	≤ 4/2	-	≥ 8/4	January 2012 (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		

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		
***Staphylococcus* spp. (continued)**									
Cefaclor	30 µg	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32	January 2012 (M100-S22)	There are limited data available to demonstrate the predictive value of testing these ß-lactam agents against staphylococci. Consequently, susceptibility results for antistaphylococcal ß-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]
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		
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		
Kanamycin	30 µg	≥ 18	14-17	≤ 13	≤ 16	32	≥ 64	January 2017 (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; this aminoglycoside should not be considered.
Loracarbef	30 µg	≥ 18	15-17	≤ 14	≤ 8	16	≥ 32	January 2012 (M100-S22)	There are limited data available to demonstrate the predictive value of testing these ß-lactam agents against staphylococci. Consequently, susceptibility results for antistaphylococcal ß-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]
Meropenem	10 µg	≥ 16	14-15	≤ 13	≤ 4	8	≥ 16		
Moxalactam	30 µg	≥ 23	15-22	≤ 14	≤ 8	16-32	≥ 64		

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		
***Staphylococcus* spp. (continued)**									
Netilmicin	30 µg	≥ 15	13-14	≤ 12	≤ 8	16	≥ 32	January 2017 (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; this aminoglycoside should not be considered.
Oxacillin (*S. aureus*/ *S. lugdunensis*)	1 µg	≥ 13	11-12	≤ 10	-	-	-	January 2012 (M100-S22)	Oxacillin disk diffusion performance is inferior to that of cefoxitin for detection of *mecA*-mediated oxacillin resistance.
Piperacillin-tazobactam	100/10 µg	≥ 18	-	≤ 17	≤ 8/4	-	≥ 16/4	January 2012 (M100-S22)	There are limited data available to demonstrate the predictive value of testing this ß-lactam agent against staphylococci. Consequently, susceptibility results for antistaphylococcal ß-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]
Telithromycin	15 µg	≥ 22	19-21	≤ 18	≤ 1	2	≥ 4	January 2018 (M100, 28th ed.)	This agent is no longer available.
Ticarcillin-clavulanate	75/10 µg	≥ 23	-	≤ 22	≤ 8/2	-	≥ 16/2	January 2012 (M100-S22)	There are limited data available to demonstrate the predictive value of testing this ß-lactam agent against staphylococci. Consequently, susceptibility results for antistaphylococcal ß-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]
Tobramycin	10 µg	≥ 15	13-14	≤ 12	≤ 4	8	≥ 16	January 2017 (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; this aminoglycoside should not be considered.
Haemophilus influenzae* and *Haemophilus parainfluenzae									
Amoxicillin-clavulanate	20/10 µg	≥ 20	-	≤ 19	-	-	-	March 2021 (M100-Ed31)	These breakpoints do not correlate with revised MIC breakpoints.
Telithromycin	15 µg	≥ 15	12-14	≤ 11	≤ 4	8	≥ 16	January 2018 (M100, 28th ed.)	This agent is no longer available.

Breakpoints Archived 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		
Neisseria gonorrhoeae									
Cefetamet	10 µg	≥ 29	-	-	≤ 0.5	-	-	January 2018 (M100, 28th ed.)	This agent currently has no role in the management of gonococcal infections. It is not on the list of recommended treatments, in contemporary treatment guidelines for uncomplicated infections, or for special situations.
Cefixime	5 µg	≥ 31	-	-	-	-	-	January 2025 (M100-Ed35)	The disk diffusion breakpoints have been temporarily removed pending additional review.
Cefmetazole	30 µg	≥ 33	28-32	≤ 27	≤ 2	4	≥ 8	January 2018 (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.
Ceftazidime	30 µg	≥ 31	-	-	≤ 0.5	-	-	January 2018 (M100, 28th ed.)	
Ceftriaxone	30 µg	≥ 35	-	-	-	-	-	January 2025 (M100-Ed35)	The disk diffusion breakpoints have been temporarily removed pending additional review.
Cefuroxime	30 µg	≥ 31	26-30	≤ 25	≤ 1	2	≥ 4	January 2018 (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.
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	January 2018 (M100, 28th ed.)	This agent is no longer available.
Neisseria meningitidis									
Sulfisoxazole	N/A	-	-	-	≤ 2	4	≥ 8	February 2024 (M100-Ed34)	This agent is no longer available.
Anaerobes									
Mezlocillin	N/A	-	-	-	≤ 32	64	≥ 128	January 2015 (M100-S25)	These agents are no longer available.
Piperacillin	N/A	-	-	-	≤ 32	64	≥ 128	January 2020 (M100, 30th ed.)	
Ticarcillin	N/A	-	-	-	≤ 32	64	≥ 128	January 2015 (M100-S25)	

Abbreviations: AD, agar dilution; AST, antimicrobial susceptibility testing; BMD, broth microdilution; I, intermediate; MIC, minimal inhibitory concentration; N/A, not applicable; PK/PD, pharmacokinetic/pharmacodynamic; R, resistant; S, susceptible; UTI, urinary tract infection.
Symbol: ^, designation for agents that have the potential to concentrate in the urine.

References

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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. doi: 10.1128/JCM.01287-15

3 Dien Bard J, Hindler JA, Gold HS, Limbago B. Rationale for eliminating *Staphylococcus* breakpoints for β-lactam agents other than penicillin, oxacillin or cefoxitin, and ceftaroline. *Clin Infect Dis*. 2014;58(9):1287-1296. doi:10.1093/cid/ciu043

Breakpoints Archived From CLSI Document M100 Since 2010

Disk Diffusion Directly From Positive Blood Culture Broth Breakpoints Archived From CLSI Document M100 Since 2025

Antimicrobial Agent	Disk Content	Read Times, h	Interpretive Categories and Zone Diameter Breakpoints, nearest whole mm			M100 Edition in Which Breakpoints Were Last Included/Comments	Rationale
			S	I	R		
Acinetobacter spp.							
Tobramycin	10 µg	8-10 16-18	≥ 15 ≥ 15	13-14 13-14	≤ 12 ≤ 12	January 2025 (M100-Ed35)	The disk diffusion breakpoints have been temporarily removed pending additional review.

Abbreviations: h, hour(s); I, intermediate; R, resistant; S, susceptible.