

Table 11. MIC and zone diameter breakpoints for *Streptococcus pneumoniae*

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Antibiotic	MIC breakpoint (mg/L)			Disc content (µg)	Interpretation of zone diameters (mm)			Comment
	R >	I	S ≤		R ≤	I	S ≥	
Penicillins								<p>Reduced susceptibility to penicillin in <i>Streptococcus pneumoniae</i> is most reliably detected with an oxacillin 1 µg disc; confirm resistance with a penicillin MIC determination. Organisms with an MIC ≤ 2mg/L are considered susceptible to β-lactam agents except in infections of the central nervous system. In addition, cefotaxime or ceftriaxone MIC determination is advised for isolates from meningitis or other invasive infections.</p> <p>Isolates categorised as S by the oxacillin 1 µg disc can be reported S for cefepime, cefotaxime, cefpodoxime, ceftriaxone and cefuroxime ± axetil. For cefaclor there are very few isolates with MIC values of 0.03 mg/L. Zone breakpoints are given to categorise isolates with I susceptibility.</p> <p>Isolates with MIC values above the S/I breakpoint for cefotaxime or ceftriaxone are very rare. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC above the current resistant breakpoint they should be reported resistant.</p> <p>For cefuroxime the zone diameter breakpoints relate to an MIC breakpoint of 0.5 mg/L as no data for the intermediate category are currently available.</p>
Penicillin	2	0.12-2	0.06	Oxacillin1	10	11-19	20	
Cephalosporins								
Cefaclor	0.5	0.06-0.5	0.03	30	19	20	-	
Cefotaxime	2	1-2	0.5	5	20	21-24	25	
Cefpodoxime	1	-	1	1	21	-	22	
Ceftizoxime	1	-	1	30	29	24-27	30	
Ceftriaxone	2	1-2	0.5	30	23	-	28	
Cefuroxime	1	1	0.5	5	24	-	25	

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Carbapenems								
Ertapenem	0.5	-	0.5					<p>Screen for β-lactam resistance with the oxacillin 1 µg disc. Isolates categorised as S can be reported S for ertapenem, imipenem and meropenem.</p> <p>Meropenem is the only carbapenem used for meningitis. For use in meningitis determine the meropenem MIC value.</p> <p>Isolates with MIC values above the S/I breakpoint are very rare or not yet reported. The identification and antimicrobial susceptibility tests on any such isolate must be repeated and if the result is confirmed the isolate sent to a reference laboratory. Until there is evidence regarding clinical response for confirmed isolates with MIC above the current resistant breakpoint they should be reported resistant.</p>
Imipenem	2	-	2					
Meropenem	2	-	2					
Quinolones								
Ciprofloxacin	2	0.25-2	0.12	1	9	10-24	25	<p>"Wild type" isolates (ciprofloxacin MICs 0.25-2 mg/L; ofloxacin MICs 0.25-4 mg/L) are considered intermediate in susceptibility.</p>
Ofloxacin	4	0.25-4	0.12	5	15	16-27	28	
Gatifloxacin	1	-	1	2	19	-	20	
Gemifloxacin	0.25	-	0.25	1	19	-	20	
Levofloxacin	2	-	2	1	9	-	10	
Moxifloxacin	0.5	-	0.5	1	17	-	18	
Miscellaneous antibiotics								
Azithromycin	0.5	0.5	0.25	15	19	20-21	22	
Chloramphenicol	8	-	8	10	17	-	18	
Clarithromycin	0.5	0.5	0.25	2	19	20-21	22	

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Miscellaneous antibiotics cont.								
Co-trimoxazole	2	2	1	1.25/23.75	16	-	17	For advice on testing susceptibility to co-trimoxazole see Appendix 1. The MIC breakpoint is based on the trimethoprim concentration in a 1:19 combination with Sulfamethoxazole.
Erythromycin	0.5	0.5	0.25	5	19	20-21	22	
Linezolid	4	4	4	10	1	-	20	The MIC breakpoint has changed but a review of the data indicates that no adjustment of the zone diameter breakpoints is necessary.
Rifampicin	0.5	0.12-0.5	0.06	5	20	21-22	23	
Telithromycin	0.5	0.5	0.25	15	28	-	29	Insufficient data are available to distinguish the intermediate category.
Tetracycline	1	-	1	10	19	-	20	The zone diameter breakpoint relates to an MIC of 1 mg/l as no data for the intermediate category are currently available.
Vancomycin	4	-	4	5	12	-	13	