MIC Test Strip Technical Sheet **Fastidious Gram Positive Bacilli**

Listeria monocytogenes, Bacillus, Corynebacterium, Erysipelothrix and *Lactobacillus* spp.

Specimen

Blood, Cerebrospinal Fluid, sterile sites (eye, fluids, tissues) and wounds.

Procedure

Medium	*Bacillus* spp. (not *B. anthracis*): Mueller Hinton II Agar, ref. 10031. *Corynebacterium*, Erysipelothrix, Lactobacillus* spp. and *L. monocytogenes**: Mueller Hinton II Agar (Sheep Blood 5%), ref. 10131 or *Mueller Hinton Fastidious Agar (Horse blood 5% + 20 mg/L β-NAD), ref. 10132.
Inoculum	Suspension in physiological solution or Mueller Hinton Broth (ref. 24107) to 0.5-1 McFarland (ref. 80405).
Incubation	*Bacillus* spp. (not *B. anthracis*): 35 ± 2°C, ambient air, 16-20 hours. *Corynebacterium, Erysipelothrix, Lactobacillus* spp. and *L. monocytogenes*: 35 ± 2°C; 5%CO_2 or anaerobic atmosphere, as required for optimal growth / 16-20 h or longer if slow grower.
Evaluating the results	Bactericidal drugs: interpret the M.I.C. at complete growth inhibition including microcolonies, hazes and isolated colonies. Bacteriostatic drugs: interpret the M.I.C. at 80% inhibition when trailing is seen.

		Quality Control (MIC µg/mL)		Examples of ANTIBIOGRAM				
		S. pneumoniae **ATCC® 49619**	***S. aureus*** **ATCC® 29213**	***Bacillus* spp.** 140 mm petri dish	***Corynebacterium* spp.** 140 mm petri dish	***Erysipelothrix* spp.** 140 mm petri dish	***Lactobacillus* spp.** 140 mm petri dish	***L. monocytogenes*** 90 mm petri dish
FEP	CEFEPIME	0.03-0.25	1-4		✓ or CTX	✓ or CTX		
CTX	CEFOTAXIME	0.03-0.12	1-4					
CRO	CEFTRIAXONE	0.03-0.12	1-8					
C	CHLORAMPHENICOL	2-8	2-16					
CD	CLINDAMYCIN (-CO_2)	0.03-0.12	0.06-0.25					
CD	CLINDAMYCIN (+CO_2)	0.064-0.25		✓	✓	✓	✓	
DAP	DAPTOMYCIN	0.06-0.5	0.12-1					
E	ERYTHROMYCIN (-CO_2)	0.03-0.12	0.25-1					
E	ERYTHROMYCIN (+CO_2)	0.064-0.25		✓	✓	✓	✓	
IMI	IMIPENEM	0.03-0.12	0.016-0.06			✓ or MRP		
LEV	LEVOFLOXACIN	0.5-2	0.06-0.5	✓				
LNZ	LINEZOLID	0.25-2	1-4					
MRP	MEROPENEM	0.03-0.25	0.03-0.12					
P	PENICILLIN G	0.25-1	0.25-2	✓	✓	✓	✓	✓
QDA	QUINUPRISTIN-DALFOPRISTIN	0.25-1	0.25-1					
RD	RIFAMPICIN	0.016-0.06	0.004-0.016					
TE	TETRACYCLINE	0.06-0.5	0.12-1					
SXT	TRIMETHOPRIM-SULFAMETHOXAZOLE (1/19)	0.12-1	≤0.5					✓
VA	VANCOMYCIN	0.12-0.5	0.5-2	✓	✓		✓	

Organism	**Antimicrobial Agent**		**CLSI INTERPRETATION MIC Criteria (µg/mL)**			**EUCAST INTERPRETATION MIC Criteria (µg/mL)**	
			S	**I**	**R**	**S**	**R**
***Bacillus* spp. (not *B. anthracis*)**	**C**	CHLORAMPHENICOL	≤8	16	≥32		
	CD	CLINDAMYCIN	≤0.5	1-2	≥4	≤1	>1
	E	ERYTHROMYCIN	≤0.5	1-4	≥8	≤0.5	>0.5
	IMI	IMIPENEM	≤4	8	≥16	≤0.5	>0.5
	LEV	LEVOFLOXACIN	≤2	4	≥8	≤0.001	>1
	P	PENICILLIN G	≤0.12	-	≥0.25		
	RD	RIFAMPICIN	≤1	2	≥4		
	TE	TETRACYCLINE	≤4	8	≥16		
	SXT	TRIMETHOPRIM-SULFAMETHOXAZOLE (1/19)	≤2	-	≥4		
	VA	VANCOMYCIN	≤4	-	-	≤2	>2
***Corynebacterium* spp.**	**FEP**	CEFEPIME	≤1	2	≥4		
	CTX	CEFOTAXIME	≤1	2	≥4		
	CRO	CEFTRIAXONE	≤1	2	≥4		

Organism	Antimicrobial Agent		CLSI INTERPRETATION MIC Criteria (µg/mL)			EUCAST INTERPRETATION MIC Criteria (µg/mL)	
			S	I	R	S	R
	CD	CLINDAMYCIN	≤0.5	1-2	≥4	≤0.5	>0.5
	DAP	DAPTOMYCIN	≤1	-	-		
	E	ERYTHROMYCIN	≤0.5	1	≥2		
	LNZ	LINEZOLID	≤2	-	-	≤2	>2
	MRP	MEROPENEM	≤0.25	0.5	≥1		
	P	PENICILLIN G	≤0.12	0.25-2	≥4	≤0.12	>0.12
	QDA	QUINUPRISTIN-DALFOPRISTIN	≤1	2	≥4		
	RD	RIFAMPICIN	≤1	2	≥4	≤0.06	>0.5
	TE	TETRACYCLINE	≤4	8	≥16	≤2	>2
	SXT	TRIMETHOPRIM-SULFAMETHOXAZOLE (1/19)	≤2	-	≥4		
	VA	VANCOMYCIN	≤2	-	-	≤2	>2
***Erysipelothrix* spp.**	**FEP**	CEFEPIME	≤1	-	-		
	CTX	CEFOTAXIME	≤1	-	-		
	CRO	CEFTRIAXONE	≤1	-	-		
	CD	CLINDAMYCIN	≤0.25	0.5	≥1		
	E	ERYTHROMYCIN	≤0.25	0.5	≥1		
	IMI	IMIPENEM	≤0.5	-	-		
	LEV	LEVOFLOXACIN	≤2	-	-		
	MRP	MEROPENEM	≤0.5	-	-		
	P	PENICILLIN G	≤0.12	-	-		
***Lactobacillus* spp.**	**CD**	CLINDAMYCIN	≤0.5	1	≥2	≤4	>4
	E	ERYTHROMYCIN	≤0.5	1-4	≥8		
	IMI	IMIPENEM	≤0.5	1	≥2	≤2	>4
	P	PENICILLIN G	≤8	-	-	≤0.25	>0.5
	VA	VANCOMYCIN	≤2	4-8	≥16	≤2	>2
Listeria monocytogenes	**P**	PENICILLIN G	≤2	-	-	≤1	>1
	SXT	TRIMETHOPRIM-SULFAMETHOXAZOLE (1/19)	≤0.5	-	-	≤0.06	>0.06

Susceptible (**S**), Intermediate (**I**), Resistant (**R**)

Notes:

For combination agents, MIC values are expressed as the concentration of the first component of the combination.

For some capnophilic organisms CLSI broth microdilution (BMD) method uses ambient incubation (-CO_2), while MTS method may require incubation in atmosphere enriched with carbon dioxide (+CO_2). This is expected to decrease the pH of the medium resulting in a decreased activity (higher MICs) of certain antimicrobial agents, like clindamycin and erythromycin. Thus, both QC ranges and interpretive criteria adjusted for CO_2 incubation should be used when capnophilic strains are tested against such drugs.

For *Lactobacillus* spp, EUCAST breakpoints apply to Gram-positive anaerobes except *Clostridioides difficile*.

For *L. monocytogenes* in association with Penicillin G, EUCAST breakpoints refer to indications other than meningitis.

Disclaimer: The table is intended for general guidance only and may not contain all the necessary information. Also reported interpretive criteria and QC MIC ranges might be out of date. Always current guidelines from CLSI and/or EUCAST should be consulted.

References

1. CLSI M100S. Performance Standards for Antimicrobial Susceptibility Testing. 31st Edition, 2021.
2. EUCAST. Breakpoint tables for interpretation of MICs and zone diameters, Version 11.0, 2021.
3. Routine and extended internal quality control for MIC determination and disk diffusion as recommended by EUCAST. Version 11.0, 2021.
4. EUCAST Disk Diffusion Method for Antimicrobial Susceptibility Testing, Version 9.0, 2021.
5. CLSI M07. Methods for Dilution Antimicrobial Susceptibility Tests for Bacteria That Grow Aerobically. 11th Edition, 2018.
6. CLSI M45. Methods for Antimicrobial Dilutions and Disk Susceptibility Testing of Infrequently Isolated or Fastidious Bacteria. 3rd Edition, 2016.

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