Activity of Delafloxacin and Comparator Agents Against Bacterial Isolates from Patients with Diabetic Foot Infection in the United States and Europe (2017-2023)

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Introduction

- Delafloxacin is a fluoroquinolone antibacterial with oral and intravenous treatment options approved in 61 countries for treatment of acute bacterial skin and skin structure infection (ABSSSI) and community-acquired bacterial pneumonia (CABP) caused by specific pathogens in adults.
- Indicated organisms/organism groups for delafloxacin and ABSSSI in the United States include: staphylococci (S. aureus [SA] both methicillin-susceptible [MSSA] and methicillin-resistant [MRSA], S. haemolyticus, and S. lugdunensis), streptococci (Streptococcus pyogenes, S. agalactiae, and S. anginosus group), Enterococcus faecalis, Enterobacterales (Enterobacter cloacae, Escherichia coli, and Klebsiella pneumoniae), and Pseudomonas aeruginosa.
- In this study, the *in vitro* activity of delafloxacin, ciprofloxacin, levofloxacin, moxifloxacin, minocycline, meropenem-vaborbactam, and oritavancin were determined against bacterial isolates from patients with diabetic foot infection (DFI) in the United States (US) and Europe (2017–2023).

Materials and Methods

- ABSSSI isolates from patients with DFI were collected in the SENTRY Antimicrobial Surveillance Program (2017–2023) from medical centers located in the US and Europe.
- Broth microdilution susceptibility testing was conducted according to Clinical and Laboratory Standards Institute (CLSI) methods and CLSI, EUCAST, and FDA breakpoint interpretive criteria (2025) were applied.
- Bacterial isolate identifications were determined at participating SENTRY sites and confirmed at Element Iowa City (JMI Laboratories) using matrix-assisted laserdesorption ionization time-of-flight mass spectrometry (as needed).

Results

- The most common DFI pathogens from patients with ABSSSI in the SENTRY Antimicrobial Surveillance Program based on prevalence during 2017–2023 were S. aureus (38%), Enterobacterales (32%), P. aeruginosa (11%), enterococci (8%), streptococci (7%), other staphylococci (2%), and other non-fermenters (2%) (Figure 1).
- MRSA rates in DFI patients were 39.0% (60/154) in the US and 25.9% (42/162) in Europe.
- Overall, 87.7% (FDA) of *S. aureus* isolates from patients with DFI in the United States were susceptible to delafloxacin (Table 1), including 96.7% of MSSA and 73.3% of MRSA.
- 85.2% of *S. aureus* isolates from DFI patients in Europe were susceptible to delafloxacin (Table 1), including 96.9% of MSSA and 45.2% of MRSA.
- Comparator fluoroquinolone susceptibilities against *S. aureus* isolates from the US and Europe were 66.9% (CLSI/EUCAST/FDA) and 75.4% (CLSI/EUCAST/FDA), respectively, for levofloxacin, and 66.9% (CLSI/EUCAST/FDA) and 75.3% (CLSI/EUCAST/FDA), respectively, for moxifloxacin (Table 1).
- All S. aureus isolates were susceptible (100.0%; CLSI/EUCAST/FDA) to oritavancin (Table 1).
- All (100.0%) S. haemolyticus (n=2), S. lugdunensis (n=4), S. pyogenes (n=6), and S. anginosus group (n=4) isolates from patients with DFI were susceptible (ABSSSI breakpoints) to delafloxacin (data not shown).

- Susceptibility of Streptococcus agalactiae isolates (n=34) to delafloxacin was 97.1%/100.0% (EUCAST/FDA) using ABSSSI breakpoints (Table 1).
- 83.3% of *E. faecalis* isolates from DFI were susceptible to delafloxacin (FDA), levofloxacin (CLSI/EUCAST/FDA), and moxifloxacin (FDA) (Table 1).
- Overall, 60.8%/69.4% (EUCAST/FDA), 79.9% (CLSI/EUCAST/FDA), and 82.8% (CLSI/ EUCAST/FDA) of all Enterobacterales isolates from patients with DFI in the US and Europe were susceptible to delafloxacin, ciprofloxacin, and levofloxacin, respectively
- 36.9% (116/314) of Enterobacterales isolates from patients with DFI in the US and Europe were E. cloacae species complex (12.4%), E. coli (17.8%), or K. pneumoniae
- Against indicated organism groups, 87.2% (FDA) of *E. cloacae* species complex isolates, 62.5%/71.4% (EUCAST/FDA) of *E. coli* isolates, and 57.1% (FDA) of *K. pneumoniae* isolates from patients with DFI in the US and Europe were susceptible to delafloxacin
- 75.0% (FDA) of Citrobacter spp. isolates and 76.6% (FDA) of Proteus mirabilis isolates from patients with DFI in the US and Europe were susceptible (ABSSSI breakpoints) to delafloxacin (Table 2).
- Overall, 66.3% (FDA), 79.3% (CLSI/EUCAST/FDA), and 68.5%/79.3%/68.5% (CLSI/ EUCAST/FDA) of P. aeruginosa isolates from patients with DFI in the US and Europe were susceptible to delafloxacin, ciprofloxacin, and levofloxacin, respectively (Table 3).
- Susceptibility of P. aeruginosa isolates from patients with DFI to delafloxacin was higher in the US (74.4% [FDA]) compared to Europe (59.2% [FDA]) (Table 3).

Conclusions

The most prevalent pathogen in patients with DFI was S. aureus (38%) of which delafloxacin was the most active fluoroquinolone (86.3% susceptible [EUCAST/FDA])

Against MRSA, delafloxacin was active against 73.3% of isolates from patients with DFI in the United States and 45.2% of isolates from Europe.

- Delafloxacin was active against other Gram-positive DFI pathogens including haemolyticus, S. lugdunensis, S. pyogenes, and S. anginosus group isolates (100.0% susceptible [FDA]), S. agalactiae (97.1%/100.0% susceptible [EUCAST/FDA]), and E. faecalis (83.3% susceptible [FDA]).
- Overall, 87.2% (FDA) of *E. cloacae* species complex, 62.5%/71.4% (EUCAST/FDA) of E. coli, 57.1% (FDA) of K. pneumoniae, and 66.3% (FDA) of P. aeruginosa isolates from patients with DFI were susceptible to delafloxacin.
- Delafloxacin may serve as a useful treatment option (either alone or in combination) in patients with DFI including those where a broad-spectrum agent is desired. Additional clinical studies in patients with DFI are needed.

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Table 1. Activity of delafloxacin and comparators against Grampositive isolates from patients with diabetic foot infection in the United States and Europe (2017–2023)

Antimicrobial	MIC (mg/L)			CLS	SI ^a	EUCA	\ST a	US FDA ^a		
Agent										
(Region; no. tested)	MIC ₅₀	MIC ₉₀	MIC range	% S	%R	% S	%R	% S	%R	
Staphylococcu	s aureu	s (Uni	ited States; <i>n=</i>	154)						
Delafloxacin	0.008	0.5	0.001 to 4	•		87.7 b	12.3	87.7 b	7.8	
Levofloxacin	0.25	>4	0.06 to >4	66.9	33.1	66.9 ^c	33.1	66.9 ^d	22.7	
Moxifloxacin	≤0.06	4	≤0.06 to >4	66.9	29.9	66.9	33.1	66.9 ^e	29.9	
Minocycline	0.06	0.12	≤0.03 to >8	98.7	1.3	98.1	1.9	98.7 ^e	1.3	
Oritavancin	0.03	0.03	≤0.008 to 0.12	100.0		100.0	0.0	100.0 ^e		
Methicillin-resistant Staphylococcus aureus (United States; n=60)										
Delafloxacin	0.25	1	0.002 to 4			73.3 b	26.7	73.3 b	18.3	
Levofloxacin	4	>4	0.12 to >4	35.0	65.0	35.0 ^c	65.0	35.0 ^d	46.7	
Moxifloxacin	2	>4	≤0.06 to >4	35.0	60.0	35.0	65.0	35.0 ^e	60.0	
Minocycline	0.06	0.5	≤0.03 to >8	98.3	1.7	96.7	3.3	98.3 ^e	1.7	
Oritavancin	0.03	0.03	≤0.008 to 0.12	100.0		100.0	0.0	100.0 e		
Staphylococcu	s aureu	s (Eur	rope; <i>n</i> =182)						T	
Delafloxacin	0.008	0.5	≤0.0005 to 8			85.2 b	14.8	85.2 b	6.6	
Levofloxacin	0.25	>4	0.06 to >4	75.4	24.6	75.4 ^c	24.6	75.4 ^d	22.0	
Moxifloxacin	≤0.06	4	≤0.06 to >4	75.3	22.5	75.3	24.7	75.3 ^e	23.5	
Minocycline	0.06	0.12	≤0.03 to 8	98.9	0.0	97.9	2.2	98.9 ^e	0.0	
Oritavancin	0.03	0.06	≤0.008 to 0.12	100.0		100.0	0.0	100.0 e		
Methicillin-res	istant S	Staphy	lococcus aurei	us (Eur	ope; r	1=42)				
Delafloxacin	0.5	2	0.004 to 8			45.2 b	54.8	45.2 b	23.8	
Levofloxacin	>4	>4	0.12 to >4	19.0	81.0	19.0 °	81.0	19.0 ^d	73.8	
Moxifloxacin	4	>4	≤0.06 to >4	19.0	76.2	19.0	81.0	19.0 e	76.2	
Minocycline	0.06	0.25	0.06 to 8	95.2	0.0	92.9	7.1	95.2 ^e	0.0	
Oritavancin	0.015	0.06	≤0.008 to 0.12	100.0		100.0	0.0	100.0 ^e		
Staphylococcu	s aureu	s (Uni	ited States and	l Europ	e; <i>n</i> =3	36)				
Delafloxacin	0.008	0.5	≤0.0005 to 8			86.3 b	13.7	86.3 b	7.1	
Levofloxacin	0.25	>4	0.06 to >4	75.3	28.6	75.3 °	28.6	75.3 ^d	22.3	
Moxifloxacin	≤0.06	4	≤0.06 to >4	71.4	25.9	71.4	28.6	71.4 ^e	25.9	
Minocycline	0.06	0.12	≤0.03 to >8	98.8	0.6	97.9	2.1	98.8 ^e	0.6	
Oritavancin	0.03	0.06	≤0.008 to 0.12	100.0		100.0	0.0	100.0 ^e		
Streptococcus	agalac	tiae (L	Jnited States a	nd Eur	ope; n					
Delafloxacin	0.015	0.03	0.008 to 0.06			97.1 b	2.9	100.0 b		
Levofloxacin	1	1	0.5 to 2	100.0	0.0	100.0 c	0.0	100.0	0.0	
Moxifloxacin	0.12	0.25	0.06 to 0.25			100.0	0.0			
Erythromycin	4	>16	0.03 to >16	33.3	66.7	33.3	66.7	33.3	66.7 e	
Oritavancin	0.06	0.06	0.03 to 0.25	100.0		100.0	0.0	100.0 e		
Enterococcus f	aecalis	(Unit	ed States and	Europe	; n=24)				
Delafloxacin	0.12	0.5	0.03 to 1			IE ^f	IE	83.3	12.5	
Levofloxacin	1	>4	0.5 to >4	83.3	16.7	83.3 ^g	16.7	83.3	16.7 e	
Moxifloxacin	0.25	>4	0.06 to >4					83.3	16.7	
Oritavancin	0.015	0.03	0.004 to 0.03	100.0 h				100.0 e,h		
Vancomycin	1	2	0.5 to 2	100.0	0.0	100.0	0.0	100.0 e	0.0	

An arbitrary susceptible breakpoint of ≤0.001 mg/L and/or >50 mm has been published by EUCAST indicating that susceptible should not be reported for this organism-agent

Criteria as published by CLSI (2025), EUCAST (2025), and US FDA (2025)

Table 2. Activity of delafloxacin and comparators against Enterobacterales isolates from patients with diabetic foot infections in the United States and Europe (2017–2023)

Antimicrobial Agent	MIC (mg/L)			CLSIa		EUCASTa		US FDA ^a	
(Region; no. tested)	MIC ₅₀			% S	%R	%S	%R	% S	%R
Enterobacterales (Unite									
Delafloxacin	0.12	2	0.008 to >16			62.7 b	37.3	72.2 c,d	21.7
Ciprofloxacin	≤0.03	4	≤0.03 to >4	83.3	14.4	83.3 ^e		83.3 ^f	14.4
Levofloxacin	0.06	4	≤0.03 to >16	85.0	13.3	85.0	13.3	85.0 ^f	13.3
Minocycline (<i>n</i> =115)	2	32	0.25 to >32	60.0	25.2			60.0 ^f	25.2
Meropenem-vaborbactam	0.03	0.06	≤0.015 to 0.12	100.0		100.0	0.0	100.0 f	
Enterobacterales (Europ	oe; <i>n</i> =13	34)			ı				
Delafloxacin	0.12	4	0.008 to >16			58.2 b	41.8	65.7 c,d	27.6
Ciprofloxacin	≤0.03	4	≤0.03 to >4	75.4	21.6	75.4 ^e	21.6	75.4 ^f	21.6
Levofloxacin	0.06	4	≤0.03 to >16	79.9	14.9	79.9	14.9	79.9 ^f	14.9
Minocycline (n=133)	2	16	0.25 to >32	70.7	17.3			70.7 ^f	17.3
Meropenem-vaborbactam	0.03	0.06	≤0.015 to 8	99.3	0.0	100.0	0.0	99.3 ^f	0.0
Enterobacterales (Unite	d State	s and	Europe; <i>n</i> =314 ^g)					
Delafloxacin	0.12	4	0.008 to >16			60.8 b	39.2	69.4 c,d	24.2
Ciprofloxacin	≤0.03	4	≤0.03 to >4	79.9	17.5	79.9 e	20.1	79.9 ^f	17.5 f
Levofloxacin	0.06	4	≤0.03 to >16	82.8	14.0	82.8	14.0	82.8 ^f	14.0
Minocycline (n=248)	2	16	0.25 to >32	65.7	21.0			65.7 ^f	21.0
Meropenem-vaborbactam	0.03	0.06	≤0.015 to 8	99.7	0.0	100.0	0.0	99.7 ^f	0.0
Citrobacter spp. (United	States	and E	urope; <i>n</i> =28 ^g)						
Delafloxacin	0.06	2	0.015 to 8					75.0 c,d	14.3
Ciprofloxacin	≤0.03	0.12	≤0.03 to 1	96.4	3.6	96.4 ^e	3.6	96.4 ^f	3.6 f
Levofloxacin	0.06	1	≤0.03 to 2	89.3	3.6	89.3	3.6	89.3 ^f	3.6
Minocycline (n=17)	2	4	0.5 to >32	94.1	5.9			94.1 ^f	5.9
Meropenem-vaborbactam	0.015	0.03	≤0.015 to 0.03	100.0	0.0	100.0	0.0	100.0 f	0.0
Enterobacter cloacae an	d E. clo	acae s	species complex	(Unite	d Sta	tes an	d Eur	ope; <i>n</i> =3	39)
Delafloxacin	0.12	2	0.008 to >16	•				87.2 c,d	10.3
Ciprofloxacin	≤0.03	0.5	≤0.03 to 4	89.7	7.7	89.7 ^e	7.7	89.7 ^f	7.7 ^f
Levofloxacin	0.06	0.25	≤0.03 to 2	94.8	2.6	94.8	2.6	94.8 ^f	2.6
Minocycline (n=31)	2	4	0.5 to >32	93.5	3.2			93.5 ^f	3.2
Meropenem-vaborbactam	0.015	0.03	≤0.015 to 0.25	100.0	0.0	100.0	0.0	100.0 f	0.0
Escherichia coli (United	States	and E	urope; <i>n</i> =56)						
Delafloxacin	0.06	4	0.008 to >16			62.5	37.5	71.4 c,d	25.0
Ciprofloxacin	≤0.03	>4	≤0.03 to >4	71.4	23.2	71.4 ^e	23.2	71.4 ^f	23.2 ^e
Levofloxacin	0.03	16	≤0.03 to >16	76.8	23.2	76.8	23.2	76.8 ^f	23.2
Minocycline (n=49)	1	8	0.25 to >32	84.6	7.7			84.6 ^f	7.7
Meropenem-vaborbactam			≤0.015 to 0.03	100.0	0.0	100.0	0.0	100.0 f	0.0
Klebsiella pneumoniae (United	States	s and Europe; <i>n</i> =	:21)					
Delafloxacin	0.12	>16	0.03 to >16					57.1 c,d	42.9
Ciprofloxacin	≤0.03	>16	≤0.03 to >16	52.4	42.9	52.4 ^e	47.6	52.4 ^f	42.9 f
Levofloxacin	0.06	32	≤0.03 to 32	71.4	28.6	71.4	28.6	71.4 ^f	28.6
Minocycline (n=16)	2	16	1 to >32	87.5	12.5			87.5 ^f	12.5
Meropenem-vaborbactam	0.03	0.06	≤0.015 to 8	95.2	4.8	100.0	0.0	95.2 ^f	4.8
Proteus mirabilis (Unite	d State	s and	Europe; <i>n</i> =47 ^g)						
Delafloxacin	0.06	2	0.015 to >16					76.6 c,d	19.1
Ciprofloxacin	0.03	4	≤0.03 to >16	74.5	25.5	74.5 ^e	25.5	74.5 ^f	25.5 f
Levofloxacin	0.06	4	0.03 to >32	74.5	17.0	74.5	17.0	74.5 ^f	17.0
Minocycline (n=41)	16	>32	2 to >32	9.8	73.2			9.8 ^f	73.2
Meropenem-vaborbactam	0.06	0.12	0.03 to 0.25	100.0	0.0	100.0	0.0	100.0 f	0.0
^a Criteria as published by CLSI (2025), EUCAST (202	.5), and US FDA	(2025).							

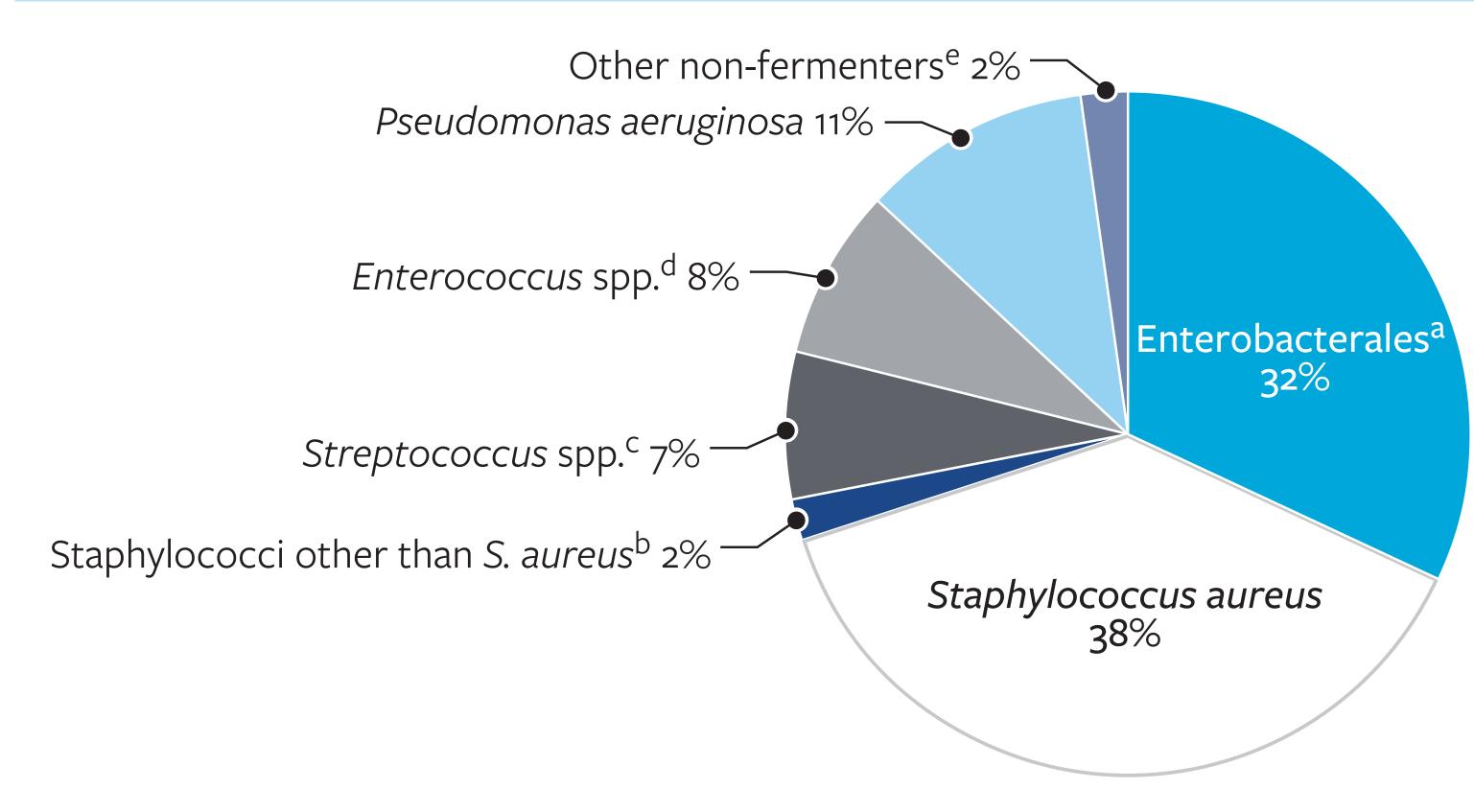
E. coli breakpoints applied to all Enterobacterales

Table 3. Activity of delafloxacin and comparators against *Pseudomonas aeruginosa* isolates from patients with diabetic foot infections in the United States and Europe (2017–2023)

Antimicrobial Agent	MIC (mg/L)			CLSIa		EUCAST ^a		US FDA ^a	
(Region; no. tested)	MIC ₅₀	MIC ₉₀	MIC range	% S	%R	%S	%R	%S	%R
Pseudomonas aeruginosa (Unit	ed States; n=43)								
Delafloxacin	0.5	2	0.12 to 16			IE b	IE ^b	74.4 ^c	18.6
Ciprofloxacin	0.12	1	0.06 to 8	86.0	9.3	86.0 ^d	14.0	86.0 ^e	9.3
Levofloxacin	0.5	4	0.25 to 16	79.1	16.3	83.7 ^d	16.3	79.1 ^e	16.3
Meropenem-vaborbactam	0.25	2	0.06 to 8			100.0	0.0		
Pseudomonas aeruginosa (Euro	pe; <i>n</i> =49)								
Delafloxacin	0.5	16	0.015 to >16			IE b	IE ^b	59.2 ^c	28.6
Ciprofloxacin	0.12	>4	≤0.03 to >16	73.5	24.5	73.5 ^d	26.5	73.5 ^e	24.5
Levofloxacin	1	32	0.06 to >32	59.2	24.5	75.5 ^d	24.5	59.2 ^e	24.5
Meropenem-vaborbactam	0.5	8	0.06 to >32			91.8	8.2		
Pseudomonas aeruginosa (Unit	ed States and Euro	pe; <i>n</i> =92)							
Delafloxacin	0.5	8	0.015 to >16			IE ^b	IE ^b	66.3 ^c	23.9
Ciprofloxacin	0.12	8	≤0.03 to >16	79.3	17.4	79.3 ^d	21.7	79.3 ^e	17.4
Levofloxacin	0.5	16	0.06 to >32	68.5	20.7	79.3 ^d	20.7	68.5 ^e	20.7
Meropenem-vaborbactam	0.5	2	0.06 to >32			95.7	4.3		

Criteria as published by CLSI (2025), EUCAST (2025), and US FDA (2025) ^b IE = Insufficient evidence that the organism or group is a good target for therapy with the agent.

Figure 1. Prevalence of DFI pathogens from patients in the United States and Europe (SENTRY 2017 to 2023)



^a Contains Citrobacter freundii species complex (12), C. koseri (6), Enterobacter cloacae (12), E. cloacae species complex (21), Escherichia coli (56), E. hermannii (2), Klebsiella aero ^e Contains Acinetobacter baumannii-calcoaceticus species complex (8), A. courvalinii (1), Stenotrophomonas maltophilia (4)

Acknowledgments

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References

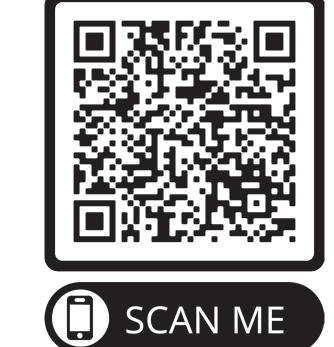
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US FDA breakpoints were applied to all Staphylococcus aureus, but they are only approved for MSSA (methicillin-susceptible S. aureus) isolates.

^f IE = Insufficient evidence that the organism or group is a good target for therapy with the agent.

US FDA breakpoints published for *E. coli, K. pneumoni*ae, and *E. cloacae* were applied to all Enterobacterales isolates.

aerogenes (5), K. oxytoca (23), K. pneumoniae (21), K. variicola (1), Morganella morganii (32), Proteus hauseri (2), P. mirabilis (47), P. penneri (2), P. vulgaris (9), P. vulgaris group (16), Providencia rettgeri (4), P. stuartii (5), Serratia liquefaciens (2), S. marcescens (17), and unspeciated Raoultella (2)

d An arbitrary susceptible breakpoint of ≤0.001 mg/L and/or >50 mm has been published by EUCAST indicating that susceptible should not be reported for this organism-agent combination and intermediate should be interpreted as susceptible, increased exposure. ^e CLSI M100 standard is recognized.