Zuckerberg San Francisco General Hospital & Trauma Center

Clinical Laboratory Microbiology

Community Health Network ANTIMICROBIAL SUSCEPTIBILITY STUDIES

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also available online:

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URINE ISOLATES

Enteric Urine Isolates	# Tested	AMP	PIPTZ	CZOL	CTAZ	CTRX	CFPM	GENT	TOB	TMSX	CIPR	LEVO	NITRO	ETP
Citrobacter koseri	33	R	100	100	100	100	100	100	100	100	100	100	76	100
Citrobacter freundii (complex)	24	R	100	R		92 ~	100	88	92	83	83	88	100	100
Enterobacter cloacae (complex)	60	R	83	R		62 ~	95	98	95	62	75	78	35	82
Escherichia coli	1,703	48	98	84 ^	90	88	90	89	83	66	74	80	98	100
ESBL	201		96					73	57	39	16	26	93	100
NON-ESBL	1,520	54	98	96 ^	99	99	99	91	87	69	81	86	99	100
Klebsiella aerogenes	35	R	94	R		86 ~	100	100	100	100	97	97	26	100
Klebsiella oxytoca	43	R	93	14	91	88	95	95	93	81	91	95	98	100
Klebsiella pneumoniae	218	R	96	97 ^	87	85	87	95	92	81	83	90	58	99
Morganella morganii	25	R	100	R	88	92	100	88	92	80	76	76	R	100
Proteus mirabilis	223	79	100	90 ^	98	95	95	92	83	81	81	84	R	99
Serratia marcescens	19	R	74	R	63	63	95	95	53	95	95	95	R	100

Non-enteric Urine Isolates	# Tested	PIPTZ	CTAZ	CFPM	GENT	TOB	TMSX	CIPR	LEVO	MERO
Acinetobacter baumannii (complex)	5		80	80	80	80	60	80	80	80
Pseudomonas aeruginosa	65	89	91	85		99	R	85	82	86
Stenotrophomonas maltophilia	6	R			R	R	100		83 "	R

Gram Positive Urine Isolates	# Tested	AMP	AMCL	NAF	CZOL	CTRX	TMSX	TET	LEVO
Staphylococcus aureus	85	55 #	65	65	65	65	98	84	67
Staphylococcus, coagulase negative	38	13 #	67	67	67	67	61	84	82

Staphylococcus saprophyticus: Uncomplicated UTIs respond to achievable urine levels of 1st gen Cephalosporins, Nitrofurantoin, Trimeth/Sulfa, or Fluoroquinolones.

* First isolate per patient for the organism. Statistical validity of %susceptible is decreased if fewer than 30 isolates are tested

^ Cefazolin %susceptible if UTI is uncomplicated.

~ Ceftriaxone is appropriate only for uncomplicated cystitis caused by these organisms.

" Neither trimethoprim-sulfamethoxazole nor levofloxacin should be used alone for treatment of *Stenotrophomonas maltophilia* .

Percent susceptible is determined by MIC and rapid beta-lactamase test only. Additional penicillin zone-edge test performed on S. aureus isolated from sterile sites only.

Mycobacterium Tuberculosis Complex		
Antimicrobial	**(mcg/mL)**	**%S**
Ethambutol	5	100
Isoniazid	0.1	93
Pyrazinamide	100	93
Rifampin	1	93

Fourteen isolates (7 respiratory and 7 non-respiratory specimens) were tested by San Francisco Department of Public Health.

NOTES:

1. Many strains of Enterobacter, *Klebsiella aerogenes*, and Citrobacter produce inducible cephalosporinases. Cephalosporins other than cefepime should be used with caution when treating serious infections caused by these bacteria.
2. *Escherichia coli, Klebsiella pneumoniae, Klebsiella oxytoca, and Proteus mirabilis* are routinely screened for extended spectrum beta-lactamases (ESBL). 13% of isolates tested in 2023 were confirmed ESBL producers [299 patients].
3. *Campylobacter jejuni/coli* group enteric infections are usually treated with fluoroquinolones or macrolides. Strains resistant to these antimicrobials have been isolated at ZSFG.
4. Rapid beta-lactamase (penicillinase) test, which indicates PCN and AMP resistance when positive, is performed on *Haemophilus influenzae, Moraxella catarrhalis, and Neisseria gonorrhoeae*. PCN and/or AMP results on table are based upon this beta-lactamase test. Other resistance mechanisms may exist.
5. *Streptococcus pneumoniae* isolates are tested by MIC method for PCN, 3rd generation cephalosporins and vancomycin susceptibilities. PCN susceptible strains are also susceptible to cephalosporins active against *Streptococcus pneumoniae*. Non-meningitis breakpoint interpretations were used for the table.

Penicillin (parenteral)	MIC Interpretation (mcg/mL)		
	Susceptible	Intermediate	Resistant
Nonmeningitis	≤ 2	4	≥ 8
Meningitis	≤ 0.06	-	≥ 0.12

6. Enterococci isolated from all sites are screened for vancomycin and ampicillin resistance.

Incidence of Enterococci Vancomycin and Ampicillin Resistance

Antimicrobial	No. Isolates Tested	No. Resistant Isolates	No. of Patients with Resistant Enterococci (Total No. Patients: 467)
Vancomycin	615	39 O (6%)	30 (6%)
Ampicillin	615	70 OO (11%)	60 (13%)

O 16 urines, 5 bloods, 6 wounds/abscesses/aspirates, 12 tissues/bones/sterile fluids

OO 31 urines, 8 bloods, 10 wounds/abscesses/aspirates, 21 tissues/bones/sterile fluids

NON-URINE ISOLATES
JANUARY - DECEMBER 2023 **PERCENT OF ISOLATES SUSCEPTIBLE TO ANTIMICROBIAL ***

Enteric Non-urine Isolates	# Tested	AMP	PIPTZ	CZOL	CTAZ	CTRX	CFPM	GENT	TOB	TMSX	CIPR	LEVO	ETP	AZTH
Citrobacter koseri	17	R	100	100	100	100	100	100	100	100	94	100	100	
Citrobacter freundii (complex)	20	R		R			100	100	100	95	85	100	100	
Enterobacter cloacae (complex)	60	R		R			97	98	98	87	92	95	95	
Escherichia coli	221	45	98	65	82	80	81	86	75	63	65	71	100	
ESBL	45		93					69	47	33	9	18	98	
NON-ESBL	178	56	99	80	99	99	100	90	83	70	79	85	100	
Klebsiella aerogenes	30	R		R			100	100	100	100	97	100	100	
Klebsiella oxytoca	41	R	100	27	98	98	98	98	98	88	93	97	100	
Klebsiella pneumoniae	133	R	98	84	91	89	90	93	90	85	87	93	100	
Morganella morganii	35	R	100	R	80	77	100	100	97	77	91	94	100	
Proteus mirabilis	116	80	99	72	99	93	93	91	78	86	83	87	100	
Salmonella sp.	11	91		R		100				91	91			
Serratia marcescens	42	R	98	R	81	88	100	100	50	98	93	98	100	
Shigella flexneri	35	11		R						26	57	63	100	58
Shigella sonnei	5	40		R						20	40	40	100	40

Gram Positive Non-urine & Misc Isolates	# Tested	PCN	AMP	AMCL	NAF	CZOL	CTRX	ERYT	CLIN	TET	VAN	GENT	TMSX	LEVO
Staphylococcus aureus	985	20 #	20 #	59	59	59	59	47	79 ~	77	100	97	99	79
Methicillin Resistant	411	R	R	R	R	R	R	12	74 ~	56	100	96	98	58
Methicillin Susceptible	585	34 #	34 #	100	100	100	100	62	78 ~	91	100	97	98	94
Staphylococcus lugdunensis	69	57 #	57 #	84	84	84	84	84	90 ~	91	100	97	99	99
Staphylococcus, Coagulase Neg	510	28 #	28 #	59	59	59	59	45	64 ~	75	100	90	75	85
	Staphylococci resistant to Nafcillin (Oxacillin) are resistant to PCN, AMP, AMCL, PIPTZ, Cephems (CZOL, CTAZ, CTRX, CFPM), & Carbapenems.													
Streptococcus pyogenes, Group A	51	100	100			100	100	61	62 ~		100	R		
Streptococcus agalactiae, Group B	20	100	100			100	100	55	60 ~		100	R		
Streptococcus pneumoniae [5]	68	100	100				100	85	92	88	100	R	86	100
Haemophilus influenzae [4]	74		78	Not tested			Not tested						Not tested	Not tested
Moraxella catarrhalis [4]	2	R	0	Not tested			Not tested						Not tested	Not tested

* First isolate per patient for the organism. Statistical validity of %susceptible is decreased if fewer than 30 isolates are tested.
~ Clindamycin %susceptible is determined by MIC and inducible clindamycin resistance test.
" Neither trimethoprim-sulfamethoxazole nor levofloxacin should be used alone for treatment of *Stenotrophomonas maltophilia* .
Penicillin %susceptible is determined by MIC and rapid beta-lactamase test. Additional penicillin zone edge test performed on *S.aureus* on sterile sites only.
! For Staphylococci that test susceptible, gentamicin is used only in combination with other active agents that test susceptible.

Non-enteric Non-urine Isolates	# Tested	PIPTZ	CTAZ	CFPM	GENT	TOB	TMSX	CIPR	LEVO	MERO
Acinetobacter baumannii (complex)	19		79	74	84	84	74	79	84	84
Pseudomonas aeruginosa	112	92	92	91		97	R	89	84	93
Stenotrophomonas maltophilia	32	R			R	R	100		97 "	R

Abbrev	Antimicrobial	Abbrev	Antimicrobial
AMCL	Amox/clavulanate	GENT	Gentamicin
AMP	Ampicillin	LEVO	Levofloxacin
AZTH	Azithromycin	MERO	Meropenem
CFPM	Cefepime	NAF	Nafcillin
CIPR	Ciprofloxacin	NITRO	Nitrofurantoin
CLIN	Clindamycin	PCN	Penicillin G
CTAZ	Ceftazidime	PIPTZ	Piperacillin/tazobactam
CTRX	Ceftriaxone	TET	Tetracycline
CZOL	Cefazolin	TMSX	Trimethoprim/sulfa
ERYT	Erythromycin	TOB	Tobramycin
ETP	Ertapenem	VAN	Vancomycin

ANAEROBIC BACTERIA

Routine antimicrobial susceptibility testing is not performed because empirical therapy and appropriate surgical treatment are usually sufficient, and because infections are frequently due to multiple bacteria, not all of which may be cultured. In special circumstances, e.g., brain absess, endocarditis, joint infection, recurrent bacteremia, testing is available upon approval by the Microbiology Resident (pager: 415 443-1438).

Rapid beta-lactamase test is performed on Gram-negative anaerobic bacteria, e.g., Bacteroides and Fusobacteria.

2022 - 2023 Laguna Honda Hospital Gram Negative Isolates

LHH: Non-urine Isolates	# Tested	CZOL	CTRX	CFPM	PIPTZ	TOB	TMSX	CIPR	ETP	MERO
Escherichia coli	20	45	70	75	100	75	75	40	100	100
Klebsiella pneumoniae	23	87	91	96	96	87	61	83	100	100
Proteus mirabilis	35	69	91	94	100	77	66	26	100	100
Pseudomonas aeruginosa	20	R	R	90	85	95	R	85	R	80
LHH: Urine Isolates	**# Tested**	**CZOL**	**CTRX**	**CFPM**	**PIPTZ**	**TOB**	**TMSX**	**CIPR**	**ETP**	**NITRO**
Escherichia coli	140	70 ^	73	77	96	84	79	51	99	95
ESBL	40				95	70	70	23	98	100
NON-ESBL	108	94 ^	98	100	97	90	82	60	100	100
Klebsiella pneumoniae	55	84 ^	84	91	98	95	76	84	100	55
Proteus mirabilis	84	99 ^	99	99	100	69	68	35	100	R
Pseudomonas aeruginosa	37	R	R	78	78	100	R	68	R	

^ Cefazolin %susceptible if UTI is uncomplicated.