

Mercy Medical Center
Des Moines, Iowa
Department of Pathology

Microbiology Department
Antibiotic Susceptibility
January – December 2016



- These statistics are intended solely as a GUIDE to choosing appropriate antibiotic therapy.
- The greater the number of organisms tested, the more valid (accurate) the percentages of susceptibility become. If less than 30 isolates are tested results may not be statistically valid.
- Even though percentages of susceptibility may be high, the antibiotic may not be clinically effective in certain cases.
- STAPHYLOCOCCI: If the organism is resistant to Oxacillin, it should also be considered resistant to Ampicillin, Penicillin, Cephalosporins, Amoxicillin/Clavulanate, Ampicillin/Sulbactam, Imipenem, and Piperacillin/Tazobactam.
- For Enterococcus spp., Cephalosporins, Aminoglycosides, Clindamycin, and Trimethoprim-sulfamethoxazole may appear active in vitro, but they are not clinically effective. Exception: For endocarditis and serious invasive tissue infections caused by Enterococcus spp., a high dose of Ampicillin combined with an Aminoglycoside (in the absence of high-level resistance) is required for improved therapeutic response and bacteriocidal action.

Mercy Medical Center Antibiogram Data - January through December 2016

Antibiotic Susceptibility	# Isolates tested	Penicillin	Ampicillin	Amp/Sul	Cefazolin	Ceftriaxone (meningitis)	Ceftriaxone (non-meningitis)	Oxacillin	Vancomycin	Clindamycin	Erythromycin	Tetracycline	Levofloxacin	Trimeth/Sulfa	(1)Nitrofurantoin
Gram Positive Cocci		Percentage of Isolates that are Susceptible													
Enterococcus spp. (all) ⁽²⁾	818	86	86						90				64		82 (582)
Enterococcus faecalis	72	97	99						88				69		100(55)
Enterococcus faecium	81	7	6						10				6		56(63)
Staphylococcus aureus ⁽³⁾ (MRSA)	490			0	0			0	100	55	14	88	34	96	100(54)
Staphylococcus aureus (MSSA)	686			99	100			100	100	79	68	95	85	99	100 (73)
Staphylococcus coagulase neg.	205			41	41			43	100		43	86	49	60	100 (144)
Streptococcus pneumoniae ⁽⁴⁾	110	97 ⁽⁶⁾													
Streptococcus pneumoniae ⁽⁵⁾	58					95	100		100		47	79	98	62	
Streptococcus agalactiae (GBS) ⁽⁷⁾	114									54	44				

⁽¹⁾Nitrofurantoin results are only reported on urinary isolates. The number of isolates tested are in parenthesis.

⁽²⁾Enterococcus (all) reflects data from speciated and unspeciated Enterococci. Enterococci are speciated when isolated from a sterile site, and/or when resistant to Vancomycin.

⁽³⁾Of the 1176 Staphylococcus aureus isolates tested: 490 were Oxacillin Resistant (42%), and 686 were Oxacillin Sensitive (58%).

⁽⁴⁾Of the 110 Strep. pneumoniae isolates reported: 107 were Penicillin **Sensitive** (97%), and 3 were Penicillin **Intermediate/Resistant** (3%).

⁽⁵⁾Strep. pneumoniae susceptibility testing is performed when a screening test suggests possible Penicillin resistance or if isolated from blood or CSF. Data charted is representative of only 58 of the 110 Strep. pneumo isolates. Results should be used accordingly.

⁽⁶⁾Strep. pneumoniae Penicillin susceptibility results are based on parenteral (nonmeningitis) breakpoints.

⁽⁷⁾GBS statistics are based on Kirby Bauer results, and include isolates from both inpatient and outpatient specimens. Kirby Bauers are performed only on request or on prenatal patients with Penicillin allergies.

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Antibiotic Susceptibility	# Isolates tested	Ampicillin	Amp/Sul	Pip/Tazo	Cefazolin	Cefuroxime	Ceftazidime	Ceftriaxone	Cefepime	Meropenem	Aztreonam	Gentamicin	Tobramycin	Ciprofloxacin	Levofloxacin	SXT	(1) Nitrofurantoin
Gram Negative Rods		Percentage of Isolates that are Susceptible															
<i>Escherichia coli</i> ⁽²⁾	970	52	58	98	86	92	94	94	95	100	95	89	90	79	79	75	98(690)
<i>Enterobacter cloacae</i> ⁽⁵⁾	161	0	0	84	0	0	79	72	94	99	76	99	99	95	96	93	14(51)
<i>Enterobacter aerogenes</i>	60	0	0	93	0	0	87	88	100	100	94	100	100	97	98	100	18(33)
<i>Klebsiella pneumoniae</i> ⁽³⁾	404	0	84	99	95	92	98	98	98	100	98	98	98	97	99	94	42(287)
<i>Klebsiella oxytoca</i> ⁽⁴⁾	114	0	68	94	40	82	92	91	92	100	93	95	96	92	94	90	91(55)
<i>Citrobacter</i> spp.	106	0	20	92	22	19	85	81	96	100	84	97	97	96	98	88	85 (66)
<i>Proteus mirabilis/penneri</i> ⁽⁶⁾	140	64	75	100	75	95	98	97	97	100	98	86	87	58	66	65	0 (87)
<i>Morganella morganii</i>	57	0	16	100	0	0	86	97	97	100	91	88	97	70	84	72	0 (25)
<i>Serratia marcescens</i>	62	0	13	87	0	0	89	98	100	100	89	95	94	97	100	92	0 (10)
<i>Pseudomonas aeruginosa</i>	432			97			94		92	95	84	92	99	80	80		
<i>Stenotrophomonas maltophilia</i>	48						38					2			88	100	

⁽¹⁾Nitrofurantoin results are only reported on urinary isolates. The number of isolates tested are in parenthesis.

⁽²⁾ Of 970 *E. coli* isolates tested, 58 were found to produce Extended Spectrum Beta Lactamase (ESBL) (6%), and 0 were found to be Carbapenem Resistant Enterobacteriaceae (CRE).

⁽³⁾ Of 404 *K. pneumo* isolates tested, 13 were found to produce Extended Spectrum Beta Lactamase (ESBL) (3%), and 0 were found to be Carbapenem Resistant Enterobacteriaceae (CRE).

⁽⁴⁾ Of 114 *K. oxytoca* isolates tested, 11 were found to produce Extended Spectrum Beta Lactamase (ESBL) (10%) and 1 was found to be Carbapenem Resistant Enterobacteriaceae (CRE) (1%).

⁽⁵⁾ Of 221 *Enterobacter* isolates tested, 6 were found to be Carbapenem Resistant Enterobacteriaceae (CRE) (3%).

⁽⁶⁾ Of 140 *P. mirabilis/penneri* isolates tested, 3 were found to produce Extended Spectrum Beta Lactamase (ESBL) (2%).

We do not routinely perform susceptibility testing on *Haemophilus influenzae* isolates. Of the 114 isolates identified in 2016, 32 were found to be Beta Lactamase positive (28%), and 82 were found to be Beta Lactamase negative (72%).

Candida spp. Antibigram Data 2012-2016

Antibiotic Susceptibility	Fluconazole	Caspofungin	Voriconazole
Candida albicans	99 (207)	100 (2)	100 (2)
Candida glabrata	59 (133)	100 (5)	67 (6)
Candida krusei ⁽¹⁾		100 (4)	100 (4)
Candida parapsilosis	100 (15)	100 (2)	100 (2)
Candida tropicalis	100 (17)		
Percentage of isolates that are susceptible (Number of isolates tested)			
If less than 30 isolates were tested, results may not be statistically valid.			
(1) Candida krusei is intrinsically resistant to Fluconazole.			

Formulary For Intravenous Anti-Infectives

ANTI-INFECTIVE	Usual Adult Dose(a)
Amikacin	7.5 - 15 mg/kg q12-24h
Amphotericin B	0.5-1 mg/kg
Ampicillin	1-2 Gm q6h
Ampicillin/Sulbactam	1.5-3 Gm q6h
Azithromycin	500 mg daily
Aztreonam	1-2 Gm q8h
Cefazolin	1-2 Gm q8h
Cefepime	1-2 Gm q12h
Cefoxitin	2 Gm q6h
*Ceftaroline	600 mg q12h
Ceftazidime	1-2 Gm q8h
Ceftriaxone	1-2 Gm daily
*Ceftolozane/Tazobactam	1.5 g q8h
Clindamycin	600-900 mg q8h
Doxycycline	100 mg q12h
*Daptomycin	4-6 mg/kg/day
Ertapenem	1 Gm daily
Erythromycin	0.5-1 Gm q6h
Gentamicin	1 mg/kg q8hrs, or 5-7mg/kg q24
Fluconazole	200-400 mg daily
Meropenem	1 gm q8hrs
*Linezolid	600 mg q12h
Levofloxacin	250-750 mg daily
Metronidazole	500 mg q8h
*Micafungin	100 - 150 mg daily
Nafcillin	2 Gm q4-6h
*Oritavancin	1200 mg; single dose
Penicillin G	18-24 MU/day
Piperacillin/Tazobactam	3.375-4.5 Gm q6h
Tigecycline	100 mg x 1 then 50 mg q12h
Tobramycin	1 mg/kg q8hrs, or 5-7mg/kg q24
Trimethoprim/Sulfamethoxazole	15-20 mg/kg/day
Vancomycin	15 mg/kg/dose

(a) may require adjustment in patients with renal or hepatic dysfunction

*USE RESTRICTED TO ID PHYSICIANS

Aminoglycosides

Gentamicin and tobramycin are on the formulary. Dosage is determined based upon patient age, weight, renal function, and underlying conditions. Calculated dosages will be rounded to the nearest 10 milligrams. Pharmacy Services are available to provide pharmacokinetic dosage recommendations upon physician request. (Call Pharmacy 247-3280)

Formulary For Oral Anti-Infectives

ANTI-INFECTIVE	Usual Adult Dose
Amoxicillin	250-500 mg q8h
Amoxicillin/Clavulanate	500 mg q8h
Ampicillin	200-500 mg q6h
Azithromycin	250-500 mg daily
Cephalexin	250-500 mg q6h
Cefpodoxime	100-200 mg q12h
Cefdinir	300 mg q12h
Cefprozil	250-500 mg q12h
Cefuroxime	500 mg q12h
Clarithromycin	250-500 mg q12h
Clindamycin	150-300 mg q6-8h
Dicloxacillin	250-500 mg q6h
Doxycycline	100 mg daily - q12h
Erythromycin	250-500 mg q6-8h
#Fidaxomicin	200 mg daily
Itraconazole	200 mg daily
Fluconazole	100-200 mg daily
Ketoconazole	200 mg daily
Levofloxacin	250-750 mg daily
*Linezolid	600 mg q 12h
Metronidazole	250-500 mg q6-8h
Minocycline	100 mg q12h
Penicillin VK	250-500 mg q6h
Tetracycline	250-500 mg q6h
Trimethoprim/Sulfamethoxazole	800-160 mg BID
Vancomycin	125 mg q 6h

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