

Using this Antibiogram

- This antibiogram provides useful information for the selection of empiric antibiotic treatment when a presumptive diagnosis of infection, with a specific bacterium, is made.
- The numbers represent the percentage of isolates that are susceptible to the antimicrobial. Susceptibility percentage for each organism / antibiotic combination is generated by including the first isolate of that organism encountered on a given patient.
- A lack of data indicates that the organism is intrinsically resistant to the antibiotic, or that insufficient data (< 10 isolates) exists.
- Isolates from certain inpatient floors (ICU, etc.) may be more resistant than isolates on the general medicine floors. Use susceptibility data wisely.
- Review footnotes for valuable information useful in antibiotic selection.
- When patient specific cultures and susceptibilities become available, alteration of drug therapy may be appropriate.
- Pharmacy or microbiology consults are available.

Contact Information

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Footnotes based on CLSI Document M100-32nd Edition

a = Oxacillin-resistant staphylococci are considered resistant to all other beta-lactam class of agents, i.e., penicillins, β -lactam combination agents, cepheims (with the exception of ceftaroline) and carbapenems.

b = Isolates that are sensitive to tetracycline are also considered sensitive to doxycycline and minocycline. However, some organisms that are intermediate or resistant to tetracycline may be susceptible to doxycycline and minocycline or both.

c = The following antimicrobial agents should not be used for bacteria isolated from the CSF: agents administered by oral route only, 1st and 2nd generation cephalosporins and cephamycins, clindamycin, macrolides, tetracyclines, and fluoroquinolones.

d = Susceptibility to azithromycin and clarithromycin can be predicted by testing erythromycin.

e = Strains of *Klebsiella* spp. and *E. coli* that produce ESBLs (Extended-Spectrum Beta-lactamases) may be clinically resistant to therapy with penicillins, cephalosporins, or aztreonam, despite apparent in vitro susceptibility to some of these agents.

f = Combination therapy of ampicillin, penicillin, or vancomycin (for susceptible strains only), plus an aminoglycoside, is usually indicated for serious enterococcal infections, such as endocarditis, unless high-level resistance to both gentamicin and streptomycin is documented; such combinations are predicted to result in synergistic killing of the *Enterococcus*.

g = Not routinely used on organisms from the urinary tract.

h = Recommended for use only against isolates in the urinary tract.

i = Rifampin should not be used alone for antibiotic therapy.

j = *Enterobacter*, *Klebsiella* (formerly *Enterobacter*) *aerogenes*, *Citrobacter*, and *Serratia* may develop resistance during prolonged therapy with third-generation cephalosporins as a result of depression of AmpC- beta lactamase. Therefore, isolates that are initially susceptible may become resistant within three to four days after initiation of therapy. Testing of repeat isolates may be warranted.

Generic Name	Trade Name	Dosage grams / dose	Dosing schedule	Daily drug cost
Penicillins				
Amoxicillin/clavulanate *	Augmentin	0.5	3	\$
Ampicillin	Omnipen	0.5	4	\$
Ampicillin/sulbactam	Unasyn	1.5	4	\$
Nafcillin *		1	6	\$\$
Penicillin VK		0.5	4	\$
Penicillin G Potassium		5 MU	4	\$
Piperacillin/tazobactam	Zosyn	3.375	3	\$
Cephalosporins				
Cefazolin	Ancef	1	3	\$
Cefdinir *	Omnicef	0.3	2	\$
Cefoxitin *	Mefoxine	1	4	\$\$
Cefuroxime *	Zinacef	0.75	3	\$
Cefotaxime	Claforan	1	3	\$
Ceftazidime	Fortaz	1	3	\$
Ceftriaxone	Rocephin	1	1	\$
Cefepime	Maxipime	1	3	\$
Aminoglycosides				
Amikacin	Amikin	0.5	2	\$
Gentamicin	Garamycin	0.08	3	\$
Tobramycin *	Nebcin	0.08	3	\$
Macrolides				
Erythromycin	Erythrocin	1	4	\$
Fluoroquinolones				
Ciprofloxacin	Cipro	0.4	2	\$
Levofloxacin	Levaquin	0.5	1	\$
Moxifloxacin	Avelox			
Monobactams				
Aztreonam	Azactam	1	3	\$\$\$
Carbapenems				
Ertapenem	Invanz	1	1	\$\$
Meropenem	Merrem	1	3	\$
Others				
Clindamycin	Cleocin	0.6	4	\$
Daptomycin *	Cubicin	0.5	1	\$\$
Linezolid	Zyvox	0.6	2	\$\$
Nitrofurantoin	Macrobid	0.1	2	\$
Rifampin	Rifadin	0.6	1	\$\$\$\$\$
Doxycycline (Tetracycline)	Vibramycin	0.1	2	\$\$
Trimethoprim/sulfamethoxazole	Bactrim	1	2	\$
Vancomycin	Vancocin	1	2	\$\$
* Antimicrobial susceptibility not performed on these antibiotics		Cost key: \$= \$0-25 \$\$= \$25.01-50 \$\$\$= \$50.01-75 \$\$\$\$= \$75.01-100 \$\$\$\$\$= ≥\$100		

2023 ANTIBIOGRAM

Antibiotic Cumulative Summary

2024 Antibiogram Based on 2023 Data

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 **Lima Memorial**
HEALTH SYSTEM
Affiliate of ProMedica

INPATIENTS Lima Memorial Health System 2023	Trade Name	% Susceptible													
		<i>Enterobacter cloacae</i> complex ¹	<i>Escherichia coli</i>	<i>Escherichia coli</i> ESBL ⁶	<i>Klebsiella oxytoca</i>	<i>Klebsiella pneumoniae</i>	<i>Proteus mirabilis</i>	<i>Pseudomonas aeruginosa</i>	<i>Serratia marcescens</i> ¹	<i>Enterococcus faecalis</i> ^f	<i>Enterococcus faecium</i> VRE	<i>Enterococcus faecium</i>	MRSA (Methicillin-resistant <i>Staphylococcus aureus</i>) ^a	MSSA (Methicillin-sensitive <i>Staphylococcus aureus</i>)	
# Isolates		33	267	36	37	83	73	92	20	106	35	45	71	82	
Penicillins															
Ampicillin	Omnipen		54	0	0	0	84			100	0	9			
Ampicillin/sulbactam	Unasyn		63	14	70	73	88								
Oxacillin	Bactocil											0	100		
Penicillin	BenPen								100	0	9	0	0		
Piperacillin/tazobactam	Zosyn	76	97	89	100	93	100	91							
Cephalosporins															
Cefazolin ^c	Ancef	0	82	0	92	83	93	0	0						
Cefotaxime ^j	Claforin														
Ceftazadime ^j	Fortaz	73	85	3	97	86	97	90	100						
Ceftriaxone ^j	Rocephin	79	85	3	97	86	97		100						
Cefepime ^j	Maxipime	97	87	6	97	87	97	90	100						
Aminoglycosides															
Amikacin	Amikin	100	99	92	100	99	100	100	100						
Gentamicin	Garamycin	100	90	81	97	93	95	98	100			100	100		
Macrolides															
Erythromycin ^{c, d, g}	Erythrocin								9	3	4	20	79		
Fluoroquinolones															
Ciprofloxacin ^c	Cipro	97	76	6	97	89	81	89	100	78	0	13	35	94	
Levofloxacin ^c	Levaquin									78	0	13	37	94	
Moxifloxacin	Avelox											62	100		
Monobactams															
Aztreonam	Azactam	76	86	6	97	86	97		100						
Carbapenems															
Ertapenem	Invanz	97	99	100	100	98	100		100						
Meropenem	Merrem	100	100	100	100	98	100	97	100						
Others															
Clindamycin ^{c, g}	Cleocin											66	86		
Linezolid	Zyvox								96	91	93	100	100		
Nitrofurantoin ^h	Macrobid	42	96	89	97	37	0	0	99	14	22	100	99		
Rifampin ⁱ	Rifadin											99	96		
Tetracycline ^{b, c}									33	9	24	76	91		
Trimethoprim/sulfamethox.	Bactrim	100	78	36	86	83	75	100				73	100		
Vancomycin	Vancocin								99	0	22	100	100		

OUTPATIENTS Lima Memorial Health System 2023	Trade Name	% Susceptible														
		<i>Citrobacter freundii</i> ¹	<i>Citrobacter koseri</i> ¹	<i>Enterobacter cloacae</i> complex ¹	<i>Escherichia coli</i>	<i>Escherichia coli</i> ESBL ⁶	<i>Klebsiella aerogenes</i> ¹	<i>Klebsiella oxytoca</i>	<i>Klebsiella pneumoniae</i>	<i>Morganella morganii</i>	<i>Proteus mirabilis</i>	<i>Pseudomonas aeruginosa</i>	<i>Serratia marcescens</i> ¹	<i>Enterococcus faecalis</i> ¹	MRSA (Methicillin-resistant <i>Staphylococcus aureus</i>) ^a	MSSA (Methicillin-sensitive <i>Staphylococcus aureus</i>)
# Isolates		20	24	47	1428	76	38	42	263	20	114	106	25	129	81	172
Penicillins																
Ampicillin	Omnipen				60	0		0	0	0	89			100		
Ampicillin/sulbactam	Unasyn				67	26		79	89	21	96					
Oxacillin	Bactocil													0	100	
Penicillin	BenPen												100	0	0	
Piperacillin/tazobactam	Zosyn	100	100	96	98	96	84	95	98	100	100	97				
Cephalosporins																
Cefazolin ^c	Ancef	0	100	0	97	1	0	90	95	0	96	0	0			
Cefotaxime ^j	Claforin															
Ceftazadime ^j	Fortaz	100	100	96	100	4	84	100	95	95	99	96	100			
Ceftriaxone ^j	Rocephin	100	100	96	100	4	87	100	96	95	98		100			
Cefepime ^j	Maxipime	100	100	100	100	7	100	100	96	100	99	97	100			
Aminoglycosides																
Amikacin	Amikin	100	100	100	100	100	100	100	100	95	100	98	100			
Gentamicin	Garamycin	100	100	100	93	76	100	100	97	89	95	98	100		98	99
Macrolides																
Erythromycin ^{c, d, g}	Erythrocin													12	11	71
Fluoroquinolones																
Ciprofloxacin ^c	Cipro	90	100	100	91	32	97	100	96	85	94	92	100	91	42	95
Levofloxacin ^c	Levaquin													91	43	95
Moxifloxacin	Avelox														80	99
Monobactams																
Aztreonam	Azactam	100	100	96	100	5	87	98	96	95	98		100			
Carbapenems																
Ertapenem	Invanz	100	100	100	100	100	97	100	99	100	99		96			
Meropenem	Merrem	100	100	100	100	100	100	100	100	100	99	100	100			
Others																
Clindamycin ^{c, g}	Cleocin														81	85
Linezolid	Zyvox													97	100	100
Nitrofurantoin ^h	Macrobid	100	88	45	98	86	13	88	43	0	0		0	100	98	99
Rifampin ⁱ	Rifadin														100	100
Tetracycline ^{b, c}														33	86	97
Trimethoprim/sulfamethox.	Bactrim	90	96	98	83	50	97	95	93	84	89		100		79	99
Vancomycin	Vancocin													100	100	100