

## Using this Antibioqram

- 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 M100-32<sup>nd</sup> Edition

a = Oxacillin-resistant staphylococci are considered resistant to all other beta-lactam class of agents, i.e., penicillins,  $\beta$ -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
<b>Penicillins</b>				
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	\$
<b>Cephalosporins</b>				
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	\$
<b>Aminoglycosides</b>				
Amikacin	Amikin	0.5	2	\$
Gentamicin	Garamycin	0.08	3	\$
Tobramycin *	Nebcin	0.08	3	\$
<b>Macrolides</b>				
Erythromycin	Erythrocin	1	4	\$
<b>Fluoroquinolones</b>				
Ciprofloxacin	Cipro	0.4	2	\$
Levofloxacin	Levaquin	0.5	1	\$
Moxifloxacin	Avelox			
<b>Monobactams</b>				
Aztreonam	Azactam	1	3	\$\$\$
<b>Carbapenems</b>				
Ertapenem	Invanz	1	1	\$\$
Meropenem	Merrem	1	3	\$
<b>Others</b>				
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	\$\$
Tigecycline	Bactrim	1	2	\$
Trimethoprim/sulfamethoxazole	Vanocin	1	2	\$\$
		* Antimicrobial susceptibility not performed on these antibiotics		
		<b>Cost key:</b> \$= \$0-25 \$\$= \$25.01-50 \$\$\$= \$50.01-75 \$\$\$\$= \$75.01-100 \$\$\$\$\$= ≥\$100		

# 2022 ANTIBIOGRAM

## Antibiotic Cumulative Summary

2023 Antibiogram Based on 2022 Data

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 **Lima Memorial**  
HEALTH SYSTEM  
Affiliate of ProMedica

INPATIENTS Lima Memorial Health System 2022															
% Susceptible	Trade Name	<i>Enterobacter cloacae</i> complex <sup>f</sup>	<i>Escherichia coli</i>	<i>Escherichia coli</i> ESBL <sup>e</sup>	<i>Klebsiella oxytoca</i>	<i>Klebsiella pneumoniae</i>	<i>Proteus mirabilis</i>	<i>Pseudomonas aeruginosa</i>	<i>Serratia marcescens</i> <sup>f</sup>	<i>Enterococcus faecalis</i> <sup>f</sup>	<i>Enterococcus faecium</i> VRE	<i>Enterococcus faecium</i>	MRSA (Methicillin-resistant <i>Staphylococcus aureus</i> ) <sup>f</sup>	MSSA (Methicillin-sensitive <i>Staphylococcus aureus</i> )	<i>Streptococcus pneumoniae</i>
# Isolates		36	227	30	30	86	56	100	23	85	27	10	61	89	12
<b>Penicillins</b>															
Ampicillin	Omnipen	61	0	0	0	93			100	7	30				
Ampicillin/sulbactam	Unasyn	71	37	80	87	96									
Oxacillin	Bactocil												0	100	
Penicillin	BenPen								100	4	20		0	0	75
Piperacillin/tazobactam	Zosyn	69	97	97	100	98	100	91							
<b>Cephalosporins</b>															
Cefazolin <sup>c</sup>	Ancef	0	94	0	100	98	96	0	0						
Cefotaxime <sup>j</sup>	Claforin														92
Ceftazadime <sup>j</sup>	Fortaz	69	100	0	100	99	98	89	100						
Ceftriaxone <sup>j</sup>	Rocephin	69	100	0	100	99	98	100							92
Cefepime	Maxipime	100	100	3	100	99	98	87	100						
<b>Aminoglycosides</b>															
Amikacin	Amikin	100	100	100	100	100	100	98	100						
Gentamicin	Garamycin	97	95	87	100	100	93	95	100				100	100	
<b>Macrolides</b>															
Erythromycin <sup>c, d, g</sup>	Erythrocin									12	0	10	18	65	58
<b>Fluoroquinolones</b>															
Ciprofloxacin <sup>c</sup>	Cipro	92	89	7	100	98	75	90	100	74	0	10	33	93	
Levofloxacin <sup>c</sup>	Levaquin									76	4	20	34	93	100
Moxifloxacin	Avelox												61	98	100
<b>Monobactam</b>															
Aztreonam	Azactam	69	100	0	100	99	96	100							
<b>Carbapenems</b>															
Ertapenem	Invanz	86	100	100	100	98	98	100							
Meropenem	Merrem	100	100	100	100	100	100	96	100						
<b>Others</b>															
Clindamycin <sup>c, g</sup>	Cleocin												61	76	83
Linezolid	Zyvox									98	96	100	100	100	100
Nitrofurantoin <sup>h</sup>	Macrobid	39	99	87	97	51	0	0	99	19	40	100	100	100	
Rifampin <sup>i</sup>	Rifadin												98	99	
Tetracycline <sup>b, c</sup>										27	11	50	70	96	75
Trimethoprim/sulfamethox.	Bactrim	97	85	47	100	94	82	100					77	99	92
Vancomycin	Vancocin									100	0	100	100	100	100

OUTPATIENTS Lima Memorial Health System 2022																
% Susceptible	Trade Name	<i>Citrobacter freundii</i> <sup>f</sup>	<i>Citrobacter koseri</i> <sup>f</sup>	<i>Enterobacter cloacae</i> complex <sup>f</sup>	<i>Escherichia coli</i>	<i>Escherichia coli</i> ESBL <sup>e</sup>	<i>Klebsiella aerogenes</i> <sup>f</sup>	<i>Klebsiella oxytoca</i>	<i>Klebsiella pneumoniae</i>	<i>Morganella morganii</i>	<i>Proteus mirabilis</i>	<i>Pseudomonas aeruginosa</i>	<i>Serratia marcescens</i> <sup>f</sup>	<i>Enterococcus faecalis</i> <sup>f</sup>	MRSA (Methicillin-resistant <i>Staphylococcus aureus</i> ) <sup>a</sup>	MSSA (Methicillin-sensitive <i>Staphylococcus aureus</i> )
# Isolates		23	23	43	1447	64	36	53	282	21	124	116	28	120	70	150
<b>Penicillins</b>																
Ampicillin	Omnipen				65	0		0	0	0	91			100		
Ampicillin/sulbactam	Unasyn				72	23		87	90	43	94					
Oxacillin	Bactocil														0	100
Penicillin	BenPen													100	0	0
Piperacillin/tazobactam	Zosyn	91	100	88	98	98	94	98	98	100	100	98				
<b>Cephalosporins</b>																
Cefazolin <sup>c</sup>	Ancef	0	96	0	98	2	0	98	99	0	95	0	0			
Cefotaxime <sup>j</sup>	Claforin															
Ceftazadime <sup>j</sup>	Fortaz	91	100	88	100	6	94	100	100	100	97	97	100			
Ceftriaxone <sup>j</sup>	Rocephin	91	100	88	100	6	97	100	100	100	97		100			
Cefepime <sup>j</sup>	Maxipime	100	100	100	100	9	100	100	100	100	97	97	100			
<b>Aminoglycosides</b>																
Amikacin	Amikin	100	100	100	100	100	100	100	100	100	100	100				
Gentamicin	Garamycin	100	100	94	94	75	100	98	100	95	96	100			99	100
<b>Macrolides</b>																
Erythromycin <sup>c, d, g</sup>	Erythrocin													19	20	72
<b>Fluoroquinolones</b>																
Ciprofloxacin <sup>c</sup>	Cipro	100	100	90	88	27	100	100	95	88	87	100	92	44	90	
Levofloxacin <sup>c</sup>	Levaquin												93	44	91	
Moxifloxacin	Avelox													76	98	
<b>Monobactams</b>																
Aztreonam	Azactam	91	100	88	100	9	94	98	100	100	97	100				
<b>Carbapenems</b>																
Ertapenem	Invanz	96	100	100	100	100	97	100	98	100		100				
Meropenem	Merrem	100	100	100	100	100	100	100	100	100	99	100				
<b>Others</b>																
Clindamycin <sup>c, g</sup>	Cleocin														76	81
Linezolid	Zyvox													98	100	100
Nitrofurantoin <sup>h</sup>	Macrobid	100	87	40	98	89	25	94	41	0	0		0	100	100	99
Rifampin <sup>i</sup>	Rifadin														100	100
Tetracycline <sup>b, c</sup>														33	83	95
Trimethoprim/sulfamethox.	Bactrim	96	100	95	84	30	100	98	94	86	84		100		84	100
Vancomycin	Vancocin													100	100	100