

## 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

Pharmacy Services	Ext. 5063
Kasie Landin, ID Pharmacist	Ext. 4718
Microbiology	Ext. 2338
Beth Siegrist, Microbiology Supervisor	Ext. 2452

## Footnotes based on CLSI Document M100-30<sup>th</sup> Edition

a = Oxacillin-resistant staphylococci are considered resistant to all other beta-lactam class of agents, i.e., penicillins,  $\beta$ -lactam combination agents, cepheems (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, 1<sup>st</sup> and 2<sup>nd</sup> 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	Tygecil	0.05	2	\$\$\$\$\$
Trimethoprim/sulfamethox.	Bactrim	1	2	\$
Vancomycin	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		

# 2020

## ANTIBIOGRAM

# Antibiotic Cumulative Summary

2021 Antibiogram Based on 2020 Data

1001 Bellefontaine Avenue | Lima, OH  
419-228-3335 | [limamemorial.org/physician-portal](http://limamemorial.org/physician-portal)

**Lima Memorial**  
HEALTH SYSTEM  
Affiliate of ProMedica

INPATIENTS Lima Memorial Health System 2020												
% Susceptible	Trade Name	<i>Escherichia coli</i>	<i>Escherichia coli</i> ESBL <sup>e</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>	MRSA (Methicillin-resistant <i>Staphylococcus aureus</i> ) <sup>a</sup>	MSSA (Methicillin-sensitive <i>Staphylococcus aureus</i> )	<i>Staphylococcus epidermidis</i>
# Isolates		252	32	28	62	19	54	86	17	78	95	50
<b>Penicillins</b>												
Ampicillin	Omnipen	58	0	0	0	0	87					
Ampicillin/subactam	Unasyn	66	9	75	87	0	93					
Oxacillin										0	100	30
Penicillin										0	0	0
Piperacillin/tazobactam	Zosyn	97	91	96	95	100	100	90				
<b>Cephalosporins</b>												
Cefazolin <sup>c</sup>	Ancef	95	0	79	98	0	94	0	0			
Ceftazadime <sup>j</sup>	Fortaz	100	0	100	100	95	96	84	94			
Ceftriaxone <sup>j</sup>	Rocephin	100	0	100	100	100	96		94			
Cefepime	Maxipime	100	9	100	100	100	96	86	100			
<b>Aminoglycosides</b>												
Amikacin	Amikin	100	100	100	100	100	100	100	100			
Gentamicin	Garamycin	95	78	100	100	89	94	98	100	100	100	86
<b>Macrolides</b>												
Erythromycin <sup>c, d, g</sup>	Erythrocin									23	68	32
<b>Fluoroquinolones</b>												
Ciprofloxacin <sup>c</sup>	Cipro	80	6	100	98	84	74	84	100	32	85	54
Levofloxacin <sup>c</sup>	Levaquin									35	86	56
Moxifloxacin	Avelox									56	99	72
<b>Monobactam</b>												
Aztreonam	Azactam	100	6	96	100	95	96		94			
<b>Carbapenems</b>												
Ertapenem	Invanz	100	100	100	100	100	100		100			
Meropenem	Merrem	100	100	100	100	100	100	91	100			
<b>Others</b>												
Clindamycin <sup>c, g</sup>	Cleocin									56	84	56
Linezolid	Zyvox									100	100	100
Nitrofurantoin <sup>h</sup>	Macrobid	96	81	71	18	0	0		0	100	99	100
Rifampin <sup>i</sup>	Rifadin									97	100	88
Tetracycline <sup>b, c</sup>										85	95	72
Trimethoprim/sulfamethox.	Bactrim	82	31	100	92	84	70		100	83	100	52
Vancocin	Vancocin									100	100	100

OUTPATIENTS Lima Memorial Health System 2020																	
% Susceptible	Trade Name	<i>Citrobacter freundii</i>	<i>Citrobacter koseri</i>	<i>Enterobacter cloacae</i> complex	<i>Enterococcus faecalis</i> <sup>f</sup>	<i>Escherichia coli</i>	<i>Escherichia coli</i> ESBL <sup>e</sup>	<i>Klebsiella aerogenes</i>	<i>Klebsiella oxytoca</i>	<i>Klebsiella pneumoniae</i>	<i>Morganella morganii</i>	<i>Proteus mirabilis</i>	<i>Pseudomonas aeruginosa</i>	<i>Serratia marcescens</i>	MRSA (Methicillin-resistant <i>Staphylococcus aureus</i> ) <sup>a</sup>	MSSA (Methicillin-sensitive <i>Staphylococcus aureus</i> )	<i>Staphylococcus epidermidis</i>
# Isolates		28	19	57	113	1414	51	40	42	250	24	117	119	18	128	203	55
<b>Penicillins</b>																	
Ampicillin	Omnipen				100	63	0		0	0	0	89					
Ampicillin/subactam	Unasyn				68	16		74	84	8	94						
Oxacillin															0	100	29
Penicillin					98										0	0	0
Piperacillin/tazobactam	Zosyn	82	100	88		98	94	95	95	94	100	98	97				
<b>Cephalosporins</b>																	
Cefazolin <sup>c</sup>	Ancef	0	95	0		97	2	0	88	98	0	92	0	0			
Ceftazadime <sup>j</sup>	Fortaz	82	100	89		100	2	98	98	100	96	94	93	100			
Ceftriaxone <sup>j</sup>	Rocephin	82	100	88		100	2	98	98	100	96	94		94			
Cefepime <sup>j</sup>	Maxipime	100	100	96		100	6	100	98	100	100	94	93	100			
<b>Aminoglycosides</b>																	
Amikacin	Amikin	100	100	100		100	100	100	100	100	100	100	99	100			
Gentamicin	Garamycin	93	100	100		94	76	100	98	100	88	97	96	100	100	100	93
<b>Macrolides</b>																	
Erythromycin <sup>c, d, g</sup>	Erythrocin				9										15	66	27
<b>Fluoroquinolones</b>																	
Ciprofloxacin <sup>c</sup>	Cipro	96	100	93	86	90	25	100	98	99	92	92	93	94	54	89	67
Levofloxacin <sup>c</sup>	Levaquin				87										55	92	67
Moxifloxacin	Avelox														82	99	84
<b>Monobactams</b>																	
Aztreonam	Azactam	86	100	89		100	6	100	98	100	100	93		100			
<b>Carbapenems</b>																	
Ertapenem	Invanz	100	100	98		100	100	100	100	100	100	98		100			
Meropenem	Merrem	100	100	100		100	100	100	100	100	100	100	100	100			
<b>Others</b>																	
Clindamycin <sup>c, g</sup>	Cleocin														77	81	56
Linezolid	Zyvox				92										100	100	100
Nitrofurantoin <sup>h</sup>	Macrobid	100	53	25	98	98	86	10	64	28	0	0		0	99	100	100
Rifampin <sup>i</sup>	Rifadin														99	100	100
Tetracycline <sup>b, c</sup>					38										91	96	82
Trimethoprim/sulfamethox.	Bactrim	82	100	89		85	33	100	95	92	83	89		100	91	99	58
Vancocin	Vancocin				100										100	100	100