

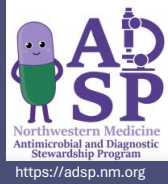


Northwest Region Hospitals Antibigrams - 2023

Huntley, McHenry, & Woodstock Hospitals

1. [Facility-wide Antibigram](#)
2. [Blood specimen-specific Antibigram](#)
3. [Emergency Department \(ED\)-specific Antibigram](#)
4. [Urine specimen-specific Antibigram](#)

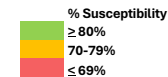
Northwest Region
2023
Facility-Wide
Antibiogram



Isolates	Ampicillin	Ampicillin/Sulbactam	Cefazolin ^e	Cefepime ^j	Ceftazidime	Ceftazidime/Avibactam	Ceftriaxone	Ciprofloxacin	Clindamycin	Daptomycin	Gentamicin	Levofloxacin	Linezolid	Meropenem ^a	Oxacillin	Penicillin G	Piperacillin/Tazobactam ^k	Sulfamethoxazole/Trimethoprim	Tetracycline	Tobramycin	Vancomycin
GRAM POSITIVES																					
Enterococcus species	364	97 ^b								97 ^f			99								99
Staphylococcus coagulase negative	50								71	100			100		56 ^h			65	74 ⁱ		100
Staphylococcus aureus	598								68	100			100		61 ^h			96	82 ⁱ		100
Methicillin-resistant Staphylococcus aureus	258								52	100			100					93	69 ⁱ		100
Streptococcus pneumoniae	47						100 ^g									100 ^g					100
GRAM NEGATIVES																					
Citrobacter species ^d	104		82	39	97	83		79	88			97	90		100			97	94		98
Enterobacter species ^d	123				93							96	94		100			87	91		95
Escherichia coli	1912	56 ^c	65	70	90	90		88	75			90	79		99			98	76		95
Klebsiella species ^d	582		78	66	92	91		88	87			96	94		99			95	90		96
Morganella morganii	37				100	68		89	81			95	81		100			100	91		95
Proteus species	283	73 ^c	83	62	96	95		93	68			88	70		100			100	78		89
Pseudomonas aeruginosa	323				93	86	99		82				77		94			93			98
Serratia species	43				100	77		81	95			100	98		100			95	98		84
MULTI-DRUG RESISTANT GRAM NEGATIVES																					
Extended-Spectrum β-Lactamase Enterobacterales (ESBL)	292						99	17			65	32		99				36			58

Antibiogram data helps guide clinicians to choose appropriate empiric antibiotics for many infectious syndromes.

[See protocol for multi-drug resistant gram-negative agents for guidance](#)



^a %S using MIC breakpoint for urine sources only (≤ 16 mcg/ml). Not recommended for use outside of cystitis caused by *P. aeruginosa*.

^b Results of ampicillin susceptibility tests should be used to predict the activity of amoxicillin.

Ampicillin may be used to predict susceptibility to amoxicillin-clavulanate, ampicillin-sulbactam, and piperacillin-tazobactam among non-β-lactamase-producing Enterococci in clinically stable/non-immunocompromised patients.

^c Results of ampicillin can predict results for amoxicillin and amoxicillin-clavulanate.

^d Klebsiella (formerly Enterobacter) aerogenes, Citrobacter freundii, and Enterobacter cloacae complex are intrinsically resistant to ampicillin/sulbactam and cefazolin and are at high-risk for ampC resistance expression.

^e For Enterobacterales, %S based on systemic MIC breakpoint of ≤ 2 (inferred via lowest Vitek automated dilution ≤ 4)

^f %S based on MIC ≤ 2 with daptomycin dosage regimen of 6-8 mg/kg every 24 hours

^g Should be reserved for patients who are intolerant to penicillins and cephalosporins or in patients who are suspected of having a drug-resistant bacteria.

^h For agents with established clinical efficacy, considering site of infection and appropriate dosing, oxacillin-susceptible Staphylococci can be considered susceptible to the following beta-lactam agents:

- 1) β-lactam combination agents (amoxicillin-clavulanate, ampicillin-sulbactam, piperacillin-tazobactam);
- 2) Oral cephalosporins (cefaclor, cefdinir, cephalexin, cefpodoxime, cefprozil, cefuroxime);
- 3) IV cephalosporins (cefazolin, cefepime, ceftriaxone); and 4) carbapenems (ertapenem, imipenem, meropenem)

ⁱ Organisms that are susceptible to tetracycline are also considered susceptible to doxycycline and minocycline. However, some organisms that are intermediate or resistant to tetracycline may be susceptible to doxycycline, minocycline, or both.

^j %S based on susceptible MIC (≤ 2) & susceptible dose dependent MIC (up to 8) for Enterobacterales

^k %S based on susceptible MIC (≤ 8) & susceptible dose dependent MIC (up to 16) for Enterobacterales

^l For moderate to severe *S. maltophilia* infections consider using combination therapy until clinical improvement is observed.

^m %S based on MIC ≤ 4 with daptomycin dosage regimen of 8-12 mg/kg every 24 hours

ⁿ %S based on MIC ≤ 1 for non-meningitis indications caused by *S. pneumoniae*

Abbreviations: %S, percent susceptible; SDD, susceptible-dose-dependent

30 isolate threshold

Blank boxes indicate organism has intrinsic resistance to corresponding antimicrobial or resistance testing is not applicable

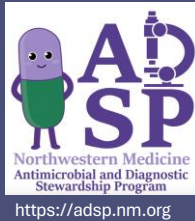
When risk for mortality or significant morbidity is high (eg. meningitis, septic shock/critical illness) agents with %S at least 90% should be selected.

Less significant concerns for mortality within the next 24 to 48 hours (eg. uncomplicated UTIs or community-acquired infections), %S of 80% may be appropriate.

Antibiogram Guidance (CLSI M100-Ed34)

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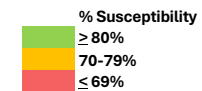
Northwest Region 2023 Blood Antibiogram



Isolates	Ampicillin	Ampicillin/Sulbactam	Cefazolin ^e	Cefepime ^j	Ceftazidime	Ceftriaxone	Ciprofloxacin	Clindamycin	Daptomycin	Doxycycline	Gentamicin	Levofloxacin	Linezolid	Meropenem ^g	Oxacillin	Piperacillin/Tazobactam ^k	Sulfamethoxazole/Trimethoprim	Tetracycline	Tobramycin	Vancocycin
GRAM POSITIVES																				
Enterococcus species	40	93 ^b							90 ^f				100							98
Staphylococcus coagulase negative	32							81	100				100		63 ^h		63	75 ⁱ		100
Staphylococcus aureus	111							57	100				100		60 ^h		98	82 ⁱ		100
Methicillin-resistant Staphylococcus aureus	45							28	100				100				98	60 ⁱ		100
GRAM NEGATIVES																				
Escherichia coli	236	53 ^c	58	69	89	87	86	77			89	80		99		96	72		89	
Klebsiella species ^d	72		76	72	94	90	85	88			97	96		99		96	92		94	
Pseudomonas aeruginosa	34				97	100		76				76		91		94			97	
MULTI-DRUG RESISTANT GRAM NEGATIVES																				
Extended-Spectrum β-Lactamase Enterobacterales (ESBL)	38							8			50	24		97			21		45	

Antibiogram data helps guide clinicians to choose appropriate empiric antibiotics for many infectious syndromes.

[See protocol for multi-drug resistant gram-negative agents for guidance](#)



^b Results of ampicillin susceptibility tests should be used to predict the activity of amoxicillin.

Ampicillin may be used to predict susceptibility to amoxicillin-clavulanate, ampicillin-sulbactam, and piperacillin-tazobactam among non-β-lactamase-producing Enterococci in clinically stable/non-immunocompromised patients.

^c Results of ampicillin can predict results for amoxicillin and amoxicillin-clavulanate.

^d Klebsiella (formerly Enterobacter) aerogenes, Citrobacter freundii, and Enterobacter cloacae complex are intrinsically resistant to ampicillin/sulbactam and cefazolin and are at high-risk for ampC resistance expression.

^e For Enterobacterales, %S based on systemic MIC breakpoint of ≤ 2 (inferred via lowest Vitek automated dilution ≤ 4)

^f %S based on MIC ≤ 2 with daptomycin dosage regimen of 6-8 mg/kg every 24 hours

^g Should be reserved for patients who are intolerant to penicillins and cephalosporins or in patients who are suspected of having a drug-resistant bacteria.

^h For agents with established clinical efficacy, considering site of infection and appropriate dosing, oxacillin-susceptible Staphylococci can be considered susceptible to the following beta-lactam agents:

- 1) β-lactam combination agents (amoxicillin-clavulanate, ampicillin-sulbactam, piperacillin-tazobactam);
- 2) Oral cephalosporins (cefaclor, cefdinir, cephalexin, cefpodoxime, cefprozil, cefuroxime);
- 3) IV cephalosporins (cefazolin, cefepime, ceftriaxone); and 4) carbapenems (ertapenem, imipenem, meropenem)

ⁱ Organisms that are susceptible to tetracycline are also considered susceptible to doxycycline and minocycline. However, some organisms that are intermediate or resistant to tetracycline may be susceptible to doxycycline, minocycline, or both.

^j %S based on susceptible MIC (≤ 2) & susceptible dose dependent MIC (up to 8) for Enterobacterales

^k %S based on susceptible MIC (≤ 8) & susceptible dose dependent MIC (up to 16) for Enterobacterales

Abbreviations: %S, percent susceptible; SDD, susceptible-dose-dependent

30 isolate threshold

Blank boxes indicate organism has intrinsic resistance to corresponding antimicrobial or resistance testing is not applicable

When risk for mortality or significant morbidity is high (eg. meningitis, septic shock/critical illness) agents with %S at least 90% should be selected.

Less significant concerns for mortality within the next 24 to 48 hours (eg. uncomplicated UTIs or community-acquired infections), %S of 80% may be appropriate.

Antibiogram Guidance (CLSI M100-Ed34)

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Northwest Region 2023 ED Antibiogram



GRAM POSITIVES

Isolates	Ampicillin	Ampicillin/Sulbactam	Cefazolin	Cefepime ^j	Ceftazidime	Ceftriaxone	Ciprofloxacin	Clindamycin	Daptomycin	Gentamicin	Levofloxacin	Linezolid	Meropenem ^g	Oxacillin	Penicillin G	Piperacillin/Tazobactam ^k	Sulfamethoxazole/Trimethoprim	Tetracycline	Tobramycin	Vancocycin
Enterococcus species	263	95 ^b							96 ^f			99								98
Staphylococcus coagulase negative	30							82	100			100		60 ^h			69	80 ⁱ		100
Staphylococcus aureus	292						72	100				100		57 ^h			97	85 ⁱ		100
Methicillin-resistant Staphylococcus aureus	128						57	100				100					94	72 ^l		100

GRAM NEGATIVES

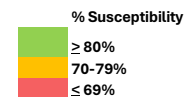
Citrobacter species ^d	75		81	42	99	83	81	88			97	91				99	93			97
Enterobacter cloacae complex ^d	78				90			92			95	92				85	88			94
Escherichia coli	1629	56 ^c	65	71	91	91	89	75			90	79				98	76			91
Klebsiella species ^d	436		80	68	93	91	89	86			96	94				95	90			95
Proteus mirabilis	190	77 ^c	86	67	96	95	96	65			86	66				100	75			87
Pseudomonas aeruginosa	171				93	94		82				76				94				98

MULTI-DRUG RESISTANT GRAM NEGATIVES

Extended-Spectrum β -Lactamase Enterobacterales (ESBL)	229							17			64	29					37			56
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Antibiogram data helps guide clinicians to choose appropriate empiric antibiotics for many infectious syndromes.

[See protocol for multi-drug resistant gram-negative agents for guidance](#)



^a %S using MIC breakpoint for urine sources only (≤ 16 mcg/ml). Not recommended for use outside of cystitis caused by *P. aeruginosa*.

^b Results of ampicillin susceptibility tests should be used to predict the activity of amoxicillin.

Ampicillin may be used to predict susceptibility to amoxicillin-clavulanate, ampicillin-sulbactam, and piperacillin-tazobactam among non- β -lactamase-producing enterococci in clinically stable/non-immunocompromised patients.

^c Results of ampicillin can predict results for amoxicillin and amoxicillin-clavulanate.

^d Klebsiella (formerly Enterobacter) aerogenes, Citrobacter freundii, and Enterobacter cloacae complex are intrinsically resistant to ampicillin/sulbactam and cefazolin and are at high-risk for ampC resistance expression.

^e %S based on MIC ≤ 2 with daptomycin dosage regimen of 6-8 mg/kg every 24 hours

^f Should be reserved for patients who are intolerant to penicillins and cephalosporins or in patients who are suspected of having a drug-resistant bacteria.

^h For agents with established clinical efficacy, considering site of infection and appropriate dosing, oxacillin-susceptible Staphylococci can be considered susceptible to the following beta-lactam agents:

- 1) β -lactam combination agents (amoxicillin-clavulanate, ampicillin-sulbactam, piperacillin-tazobactam);
- 2) Oral cephalosporins (cefazolin, cefdinir, cephalexin, cefpodoxime, cefprozil, cefuroxime);
- 3) IV cephalosporins (cefazolin, cefepime, ceftriaxone); and 4) carbapenems (ertapenem, imipenem, meropenem)

ⁱ Organisms that are susceptible to tetracycline are also considered susceptible to doxycycline and minocycline. However, some organisms that are intermediate or resistant to tetracycline may be susceptible to doxycycline, minocycline, or both.

^j %S based on susceptible MIC (≤ 2) & susceptible dose dependent MIC (up to 8) for Enterobacterales

^k %S based on susceptible MIC (≤ 8) & susceptible dose dependent MIC (up to 16) for Enterobacterales

Abbreviations: %S, percent susceptible; SDD, susceptible-dose-dependent

30 isolate threshold

Blank boxes indicate organism has intrinsic resistance to corresponding antimicrobial or resistance testing is not applicable

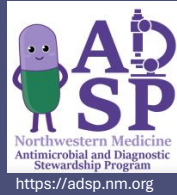
When risk for mortality or significant morbidity is high (eg, meningitis, septic shock/critical illness) agents with %S at least 90% should be selected.

Less significant concerns for mortality within the next 24 to 48 hours (eg, uncomplicated UTIs or community-acquired infections), %S of 80% may be appropriate.

Antibiogram Guidance (CLSI M100-Ed34)

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Northwest Region 2023 Urine Antibiogram



GRAM POSITIVES

Isolates	Ampicillin	Ampicillin/Subbactam	Cefazolin	Cefepime ^j	Ceftazidime	Ceftriaxone	Ciprofloxacin	Gentamicin	Levofloxacin	Linezolid	Meropenem ⁱ	Nitrofurantoin	Oxacillin	Piperacillin/Tazobactam ^k	Sulfamethoxazole/Trimethoprim	Tetracycline	Tobramycin	Vancocmycin
Enterococcus species	297	95 ^b								99	96							98
Staphylococcus aureus ^o	85									100			44 ^f	95				100

GRAM NEGATIVES

Citrobacter species ^d	82		83	43	98	82	78	87	98	89		100	82		96	94		99
Enterobacter species ^d	71				89			92	94	92		100	32		83	86		93
Escherichia coli	1731	56 ^c	65	85 ^p	90	92	88	75	90	79		99	98		98	76		91
Klebsiella species ^d	474		78 ^d	80 ^d	92	90	88	85	96	94		99	58		95	89		95
Proteus species	202	74 ^c	84	89	97	96	96	65	87	67		100			100	75		89
Pseudomonas aeruginosa	156				94	94		81		77		89			95			98

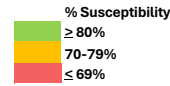
MULTI-DRUG RESISTANT GRAM NEGATIVES

Extended-Spectrum β -Lactamase Enterobacterales (ESBL-E)	252							17	66	31		99	82		37			60
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Several agents have the potential to concentrate in the urine with an intermediate MIC. Contact ADSP for appropriate indication and recommended dosing.

Antibiogram data helps guide clinicians to choose appropriate empiric antibiotics for many infectious syndromes.

[See protocol for multi-drug resistant gram-negative agents for guidance](#)



^a %S using MIC breakpoint for urine sources only (≤ 16 mcg/ml). Not recommended for use outside of cystitis caused by *P. aeruginosa*.

^b Results of ampicillin susceptibility tests should be used to predict the activity of amoxicillin.

Ampicillin may be used to predict susceptibility to amoxicillin-clavulanate, ampicillin-sulbactam, and piperacillin-tazobactam among non- β -lactamase-producing enterococci in clinically stable/non-immunocompromised patients.

^c Results of ampicillin can predict results for amoxicillin and amoxicillin-clavulanate.

^d Klebsiella (formerly Enterobacter) aerogenes, Citrobacter freundii, and Enterobacter cloacae complex are intrinsically resistant to ampicillin/sulbactam and cefazolin and are at high-risk for ampC resistance expression.

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- 3) IV cephalosporins (cefazolin, cefepime, ceftriaxone); and 4) carbapenems (ertapenem, imipenem, meropenem)

^h Organisms that are susceptible to tetracycline are also considered susceptible to doxycycline and minocycline. However, some organisms that are intermediate or resistant to tetracycline may be susceptible to doxycycline, minocycline, or both.

ⁱ For cases of cystitis, ampicillin is expected to achieve adequate urinary concentrations to overcome resistance up to MIC 256 mcg/dl and should be considered as first-line treatment.

^j %S based on susceptible MIC (≤ 2) & susceptible dose dependent MIC (up to 8) for Enterobacterales

^k %S based on susceptible MIC (≤ 8) & susceptible dose dependent MIC (up to 16) for Enterobacterales

^o Staph aureus is not an expected urinary organism, outside of rare occasions of contamination from skin flora, which may be increased in patients with urinary catheters. Recommend ordering blood cultures when isolated from urine as clinically indicated.

^p %S based on urinary MIC breakpoint of ≤ 16 for cystitis. For pyelonephritis & complicated infections outside of the bladder, refer to facility-wide antibiogram, Enterobacterales are 65-80% susceptible at MIC ≤ 4 .

Enterobacterales included for the urinary (cystitis only) MIC breakpoint include *E. coli*, *K. pneumoniae*, and *P. mirabilis* only.

Abbreviations: %S, percent susceptible; SDD, susceptible-dose-dependent

30 isolate threshold

Blank boxes indicate organism has intrinsic resistance to corresponding antimicrobial or resistance testing is not applicable

When risk for mortality or significant morbidity is high (eg. meningitis, septic shock/critical illness) agents with %S at least 90% should be selected.

Less significant concerns for mortality within the next 24 to 48 hours (eg. cystitis, pyelonephritis or community-acquired infections with prompt clinical response), %S of 80% may be appropriate.

Antibiogram Guidance (CLSI M100-Ed34)

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