

VUMC  
Antimicrobial  
Susceptibility Summary:  
Adult Patients  
2024

## **Preface**

This booklet contains up-to-date information to assist in decisions concerning antimicrobial therapy.

Tables summarize susceptibility data obtained for organisms isolated in the VUMC Clinical Microbiology Laboratory between April 1, 2024 – April 1, 2025.

## **Guidelines for Interpretation of Minimum Inhibitory Concentrations (MICs)**

MICs are interpreted as susceptible, intermediate, resistant, non-susceptible or susceptible dose dependent according to Clinical and Laboratory Standards Institute (CLSI) guidelines. When deciding whether the interpretation is meaningful, one should consider the antimicrobial pharmacokinetics, taking into account dosage and route of administration, the infecting organism and site of infection, and previous clinical experience.

For additional information, please call the microbiology laboratory, or the Antimicrobial Stewardship team.

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<https://www.vumc.org/antimicrobial-stewardship-program>

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**Table 1. Adults – Most Common Gram-negative Bacteria, % Susceptible**

Data represent first isolate per patient.

Organism	N	Amikacin	Ampicillin	Ampicillin/ Sulbactam	Cefazolin	Cefepime	Cefoxitin	Ceftazidime	Ceftriaxone	Cefuroxime axetil	Ciprofloxacin	Ertapenem	Gentamicin	Levofloxacin	Meropenem	Nitrofurantoin	Piperacillin/ Tazobactam	Trimethoprim/ Sulfamethoxazole
<i>Acinetobacter baumannii</i>	55	ND	R	82	ND	ND	ND	76	58	ND	75	R	86	76	76	ND	64	82
<i>Acinetobacter pittii</i>	41	ND	R	100	ND	ND	ND	90	54	ND	98	R	100	100	100	ND	39	95
<i>Citrobacter braakii</i>	98	100	R	74	R	100	R	74	72	R	82	99	96	85	99	99	76	93
<i>Citrobacter freundii</i>	200	100	R	R	R	98	R	81	79	R	84	99	95	85	99	93	83	83
<i>Citrobacter koseri</i>	227	ND	R	98	99	100	94	99	99	71	98	100	100	99	100	93	96	98
<i>Enterobacter asburiae</i>	56	100	R	R	R	98	R	82	82	57	89	95	98	91	96	59	80	96
<i>Enterobacter cloacae</i>	733	100	R	R	R	94	R	79	74	24	90	93	98	91	99	42	79	87
<i>Escherichia coli</i>	10535	75	55	79	87	92	94	91	90	83	72	100	91	73	100	98	94	76
<i>Klebsiella aerogenes</i>	395	ND	R	R	R	100	R	87	87	83	96	98	100	96	100	13	85	100
<i>Klebsiella oxytoca</i>	446	ND	R	87	45	95	97	94	89	86	94	100	96	95	100	88	89	91
<i>Klebsiella pneumoniae</i>	2892	78	R	82	85	90	94	87	87	82	82	99	93	82	100	19	85	84
<i>Morganella morganii</i>	177	ND	R	35	R	ND	50	ND	85	R	79	98	89	80	99	R	97	83
<i>Proteus mirabilis</i>	1046	100	86	96	93	97	97	98	94	94	87	100	93	87	99	R	100	83
<i>Proteus vulgaris</i>	54	ND	R	83	R	93	98	80	67	R	100	100	100	100	ND	R	100	94
<i>Providencia rettgeri</i>	64	ND	R	75	R	98	98	95	95	89	89	98	100	77	100	R	100	84
<i>Providencia stuartii</i>	40	ND	R	78	R	95	100	93	85	70	70	100	80	60	100	R	100	83
<i>Pseudomonas aeruginosa</i>	1648	96	R	R	ND	94	ND	93	R	ND	86	R	R	ND	93	ND	87	R
<i>Raoultella ornitholytica</i>	43	ND	R	79	79	86	91	79	79	77	74	98	81	88	98	95	88	74
<i>Serratia marcescens</i>	382	100	R	63	R	99	28	99	96	R	91	99	99	92	100	R	ND	99

R, intrinsic resistance; ND, not tested. \* Ampicillin-sulbactam dosing recommendation for *Acinetobacter* is at least 3g q4h (normal renal function), Cefazolin urine breakpoint of 16 used for *E. coli*



In the absence of recent history of resistance or severe beta-lactam allergy, cefepime is the preferred empiric gram-negative antibiotic. Piperacillin-tazobactam is preferred for *E. coli*. Antibiotic therapy should be narrowed once susceptibilities are known.

Table 2. Adults – *Staphylococcus aureus*, % Susceptible

Data represent first isolate per patient.

Organism	N	Clindamycin	Daptomycin	Doxycycline	Gentamicin	Levofloxacin	Linezolid	Nitrofurantoin	Oxacillin	Trimethoprim/Sulfamethoxazole	Vancomycin
MRSA	1325	73	100	88	97	40	100	100	R	79	100
MSSA	2378	95	100	98	98	92	100	100	100	95	100

R, intrinsic resistance; ND, not tested.

MRSA, Methicillin- resistant staphylococcus aureus

MSSA, Methicillin-sensitive staphylococcus aureus



Isolation of *S. aureus* in the urine should be followed by a blood culture to confirm the patient is not bacteremic. *S. aureus* bacteremia or suspected invasive infection should be treated with IV antibiotics in conjunction with ID consultation.

Table 3. Adults – *Staphylococcus* spp., % Susceptible

Data represent first isolate per patient. Only normally sterile site isolates included.

Organism	N	Clindamycin	Daptomycin	Doxycycline	Levofloxacin	Linezolid	Nitrofurantoin	Oxacillin	Trimethoprim/Sulfamethoxazole	Vancomycin
<i>Staphylococcus capitis</i>	875	62	100	83	66	100	100	39	52	100
<i>Staphylococcus epidermidis</i>	275	87	100	99	95	100	100	79	99	100
<i>Staphylococcus haemolyticus</i>	140	66	100	89	65	100	99	41	71	100
<i>Staphylococcus hominis</i>	86	82	100	87	77	97	93	61	57	100
<i>Staphylococcus lugdunensis</i>	67	88	100	100	82	100	100	84	97	100

\*Trimethoprim-sulfamethoxazole susceptibility available on request

Table 4. Adults – *Enterococcus* spp., % Susceptible

Data represent first isolate per patient.

Organism	N	Ampicillin	Daptomycin*	Doxycycline	Levofloxacin	Linezolid	Nitrofurantoin	Vancomycin
<i>Enterococcus faecalis</i>	2790	100	79	28	92	98	99	98
<i>Enterococcus faecium</i>	422	20	ND	24	16	96	43	45

\*Daptomycin susceptibility for *E. faecium* indicates proportion susceptible, dose dependent.



Drugs of choice for *E. faecalis* include penicillin and ampicillin in the absence of severe penicillin allergy.  
VRE infections often require treatment with restricted antibiotics such as daptomycin, which require ID approval for use.

Table 5. Adults – *Streptococcus pneumoniae*, % Susceptible

Data represent first isolate per patient.

	N	Penicillin G (Meningitis)	Penicillin G (Non-meningitis)	Penicillin G (Oral)	Ceftriaxone (Meningitis)	Ceftriaxone (Non-meningitis)	Levofloxacin	Moxifloxacin	Clindamycin	Erythromycin	Linezolid	Vancomycin	Tetracycline
<i>Streptococcus pneumoniae</i>	78	62	97	62	80	98	100	100	88	51	100	100	79

\*erythromycin susceptible isolates are also susceptible to azithromycin

Table 6. Adults – *Streptococcus* spp., % Susceptible

Data represent first isolate per patient.

Organism	N	Ampicillin	Ceftriaxone	Clindamycin	Levofloxacin	Linezolid	Penicillin G	Vancomycin
<i>Streptococcus agalactiae</i>	179	100	100	46	99	100	100	100
<i>Streptococcus anginosus</i>	147	100	97	68	99	100	97	100
<i>Streptococcus constellatus</i>	83	99	94	66	98	100	100	100
<i>Streptococcus intermedius</i>	45	100	100	66	100	100	96	100
<i>Streptococcus mitis</i>	52	95	86	77	75	100	58	100
<i>Streptococcus pyogenes</i>	33	100	100	91	100	100	100	100

R, intrinsic resistance; ND, not tested.

Table 7. Adults – Most common microorganisms isolated in blood cultures

Data represent first isolate per patient.

<b>Most common organisms in blood</b>	<b>Resistance</b>
<i>Staphylococcus aureus</i>	45% MRSA
<i>Escherichia coli</i>	28% ESBL
<i>Staphylococcus epidermidis</i>	76% oxacillin-resistant
<i>K. pneumoniae</i>	28% ESBL
<i>E. faecalis</i>	0% ampicillin-R
<i>P. aeruginosa</i>	18% pip-tazo resistant
<i>E. cloacae</i>	4% cefepime resistant
<i>Enterococcus faecium</i>	66% vancomycin resistant
<i>P. mirabilis</i>	13% ESBL

Table 8. Most common microorganisms isolated in blood cultures, % Susceptible

Data represent first isolate per patient.

Organism	N	Amikacin	Ampicillin	Ampicillin/Sulbactam	Cefepime	Cefoxitin	Ceftazidime	Ciprofloxacin	Ceftriaxone	Cefuroxime	Cefazolin	Daptomycin	Ertapenem	Linezolid	Levofloxacin	Meropenem	Piperacillin/Tazobactam	Trimethoprim/Sulfamethoxazole	Vancomycin
<i>Enterobacter cloacae</i>	54	ND	R	R	93	R	70	91	69	35	R	ND	89	ND	91	98	72	87	ND
<i>Escherichia coli</i>	287	100	40	72	77	90	74	58	72	69	71	ND	99	ND	59	100	89	60	ND
<i>Enterococcus faecalis</i>	94	ND	100	ND	ND	ND	ND	83	ND	ND	ND	76	ND	98	83	ND	ND	ND	98
<i>Enterococcus faecium</i>	64	ND	9	ND	ND	ND	ND	6	ND	ND	ND	ND	ND	98	8	ND	ND	ND	34
<i>Klebsiella pneumoniae</i> ss. <i>pneumoniae</i>	185	100	R	69	79	89	71	67	72	70	70	ND	98	ND	67	98	71	72	ND
<i>Pseudomonas aeruginosa</i>	79	100	R	R	87		86	86	R	ND	ND	ND	ND	ND	79	87	79	R	ND
<i>Proteus mirabilis</i>	30	ND	83	90	90	97	93	80	87	87	87	ND	97	ND	80	97	100	77	ND
<i>Staphylococcus aureus</i> ss. <i>aureus</i>	309	ND	ND	ND	ND	ND	ND	68	ND	ND	ND	100	ND	100	69	ND	ND	88	100
<i>Staphylococcus epidermidis</i>	178	ND	ND	ND	ND	ND	ND	56	ND	ND	ND	100	ND	100	56	ND	ND	43	100