

VUMC
Antimicrobial
Susceptibility Summary:
Adult Patients
2024

Table 3. Adults – Most Common Gram-Negative Bacteria, Non-Urine Isolates, % Susceptible

Data represent first isolate per patient.

Organism	N	Amikacin	Amoxicillin-Clavulanate	Ampicillin	Ampicillin-sulbactam [‡]	Aztreonam	Cefazolin	Cefepime	Ceftazidime	Ceftriaxone	Ciprofloxacin	Ertapenem	Gentamicin	Levofloxacin	Meropenem	Minocycline	Piperacillin-tazobactam	Tobramycin	Trimethoprim-sulfamethoxazole
<i>Achromobacter xylosoxidans</i>	36	R	R	R	R	R	R	R	76	R	ND	R	R	67	ND	ND	95	R	100
<i>Acinetobacter baumannii</i>	45	94	R	R	85	R	R	68	77	44	82	R	88	85	85	94	ND	94	82
<i>Citrobacter freundii</i> *	102	100	R	R	R	67	R	88	67	ND	79	96	90	83	98	81	73	88	81
<i>Citrobacter koseri</i>	46	100	94	R	100	100	94	100	100	100	100	100	100	100	100	100	100	100	100
<i>Enterobacter cloacae</i> *	373	100	R	R	R	79	R	91	78	ND	91	84	99	93	98	89	82	97	92
<i>Escherichia coli</i>	727	99	80	45	74	88	79	89	89	86	63	99	89	73	100	89	93	89	69
<i>Klebsiella aerogenes</i> *	108	100	R	R	R	82	R	99	82	ND	95	98	99	97	100	93	81	99	99
<i>Klebsiella oxytoca</i>	199	100	93	R	89	92	79	96	92	91	91	99	94	99	100	97	96	94	92
<i>Klebsiella pneumoniae</i>	418	100	81	R	72	78	75	80	77	78	74	96	86	77	99	84	86	84	76
<i>Morganella morganii</i>	97	100	R	R	53	100	R	100	88	88	81	100	91	81	100	R	100	94	88
<i>Proteus mirabilis</i>	226	100	99	89	99	100	92	98	99	97	84	99	94	86	ND	R	100	94	89
<i>Pseudomonas aeruginosa</i>	971	R	R	R	R	88	R	94	94	R	83	R	R	82	94	R	91	ND	R
<i>Serratia marcescens</i>	216	100	R	R	R	100	R	99	100	96	91	99	99	94	99	91	98	62	ND
<i>Stenotrophomonas maltophilia</i>	163	R	R	R	R	R	R	R	R	R	ND	R	R	65	R	90	R	R	96

R, intrinsic resistance; ND, no data.

[‡] Ampicillin-sulbactam dosing recommendation for *Acinetobacter* is at least 3g q4h (normal renal function)

**Enterobacter cloacae*, *Klebsiella aerogenes*, and *Citrobacter freundii* may develop resistance during therapy with 3rd-generation cephalosporins due to derepression of AmpC β-lactamase.



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* and trimethoprim-sulfamethoxazole for invasive *S. maltophilia* infections. Antibiotic therapy should be narrowed once susceptibilities are known.

Table 4. Adults – Gram-Negative Bacteria, Non-Urine Isolates, by Patient Location

Data represent first isolate per patient.

Organism		N	Amikacin	Amoxicillin-Clavulanate	Ampicillin	Ampicillin-sulbactam	Aztreonam	Cefazolin	Cefepime	Ceftazidime	Ceftriaxone	Ciprofloxacin	Ertapenem	Gentamicin	Levofloxacin	Meropenem	Piperacillin-tazobactam	Minocycline	Tobramycin	Trimethoprim-sulfamethoxazole
<i>Enterobacter cloacae</i> *	OP	61	100	R	R	R	93	R	100	93	91	95	93	100	95	100	95	95	100	95
	IN	238	100	R	R	R	81	R	92	80	ND	91	85	100	93	98	83	90	96	92
	ICU	74	100	R	R	R	66	R	84	65	ND	87	77	98	92	97	71	89	95	89
<i>Escherichia coli</i>	OP	203	100	85	52	84	93	88	93	94	93	71	99	93	82	100	98	89	92	71
	IN	406	99	82	46	74	89	80	90	90	87	63	99	88	73	100	94	88	88	70
	ICU	122	99	70	34	65	78	69	81	82	76	57	98	86	64	99	85	84	87	66
<i>Klebsiella pneumoniae</i>	OP	58	100	85	R	78	78	78	81	78	78	73	100	90	85	100	90	86	88	76
	IN	228	100	80	R	71	77	73	80	77	77	73	96	84	76	99	89	87	82	74
	ICU	133	100	82	R	71	77	75	79	76	77	75	96	86	75	99	80	81	85	78
<i>Pseudomonas aeruginosa</i>	OP	319	R	R	R	R	92	R	98	97	R	86	R	98	85	96	95	R	ND	R
	IN	514	R	R	R	R	87	R	94	94	R	83	R	97	82	94	89	R	ND	R
	ICU	139	R	R	R	R	82	R	84	88	R	78	R	98	78	90	88	R	ND	R
<i>Proteus mirabilis</i>	OP	72	100	96	89	96	100	93	100	100	100	91	100	96	91	ND	100	R	96	96
	IN	124	100	100	89	100	100	92	97	99	95	81	99	92	84	ND	100	R	92	85
	ICU	30	100	100	92	100	100	92	96	100	96	84	100	96	84	ND	100	R	96	88

ICU, intensive care unit; IN, inpatient; OP, outpatient (includes emergency department); R, intrinsic resistance; ND, not tested.

**Enterobacter cloacae*, *Klebsiella aerogenes*, and *Citrobacter freundii* may develop resistance during therapy with 3rd-generation cephalosporins due to derepression of AmpC β-lactamase.



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