

Gram Negative Rods

2024 Isolates

	No. of isolates (a)	Penicillins		Cephalosporins and Lactams					Carbapenems		Aminoglyc's			Others		Urinex Only	
		Ampicillin (\$)	Piper/Tazobactam (\$\$)	Cefuroxime (IV) (\$)	Ceftriaxone (\$)	Ceftazidime (\$)	Cefepime (b) (\$)	Aztreonam (\$\$\$)	Ertapenem (\$\$\$)	Meropenem (\$\$)	Amikacin (\$\$\$)	Gentamicin (\$\$\$)	Tobramycin (\$\$\$)	Ciprofloxacin (\$)	Trimethoprim/sulfa (\$)	Cefazolin (c) (\$) Predictis 1stgen cephem	Nitrofurantoin (c) (\$\$\$)
Achromobacter xylosoxidans	22(d,e)	R	82	R	R	77	0	0	R	96	18	5	14	18	100	R	-
Acinetobacter baumannii complex	14(d,e)	R	-	R	R	79	71	R	R	86	79	71	71	86	86	R	-
Citrobacter freundii complex	26(d,e)	R	61	R	58	61	-	-	100	100	100	100	100	96	92	R	100
Enterobacter cloacae complex	53	R	59	R	51	56	72 / 24	60	81	100	100	100	100	88	90	R	50
Escherichia coli	520	46	94	64	87	95	77 / 17	71	99	99	98	89	89	79	68	81	97
Klebsiella aerogenes	26(d)	R	71	R	61	65	62 / 0	62	77	85	91	100	100	96	79	R	8
Klebsiella oxytoca	45	R	91	69	87	91	79 / 0	79	100	100	100	98	98	98	84	59	97
Klebsiella pneumoniae	100	R	89	85	84	92	85 / 0	95	100	100	99	91	89	82	73	85	21
Morganella morganii	13(d)	R	-	R	85	77	100 / 0	-	100	-	-	77	69	69	69	R	R
Proteus mirabilis	43	84	100	-	95	98	-	100	100	100	100	95	95	91	84	88	R
Pseudomonas aeruginosa	126	R	91	C/T	99	94	93	82	R	94	100(c)	-	100	90	R	R	R
Pseudomonas aeruginosa (CF-mucoid) (f)	26(d,e)	R	92	C/T	92	92	85	76	Imp	84	89	-	-	89	65	R	R
Pseudomonas aeruginosa (CF-non-mucoid) (f)	27(d)	R	89	C/T	100	96	96	93	Imp	89	93	-	-	85	93	R	R
Salmonella spp.	28(d)	86	-	R	96	-	-	-	-	-	R	R	R	39	86	R	-
Serratia marcescens	37	R	100	R	92	97	100 / 0	100	100	100	100	100	87	95	100	R	R
Stenotrophomonas maltophilia	53	R	R	R	R	-	-	R	R	R	R	R	Levo	93	98	R	-

(a) First isolate from each patient was included. (b) Shows susceptible / susceptible-dose dependent. Not routinely tested on urine and blood Enterobacterales isolates. (c) Urine only. (d) Data from isolate totals <30 may be statistically unreliable. (e) Includes isolates from 2023. (f) Cystic fibrosis patient isolates tested by disk diffusion.

A/S = Ampicillin/Sulbactam; C/T = Ceftolozane/Tazobactam; Imp = Imipenem; Levo = Levofloxacin



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# Antimicrobial Stewardship Program

2025

## Antimicrobial Susceptibility and Dosing Information

Take an **Antibiotic Time Out!**

Discuss **BUG, DRUG, and DURATION**  
48—72 hours after starting an antibiotic

- What are the culture results?
- Can the antibiotic be stopped or narrowed?
- What is the planned duration for diagnosis?

### Questions?

Focused questions about antimicrobial choice, dose, route, and duration ⇒ Antimicrobial Stewardship Program (ASP) ⇒ Voalte (M-F, 8-4) or E-mail (below)

For cases requiring in-depth review and physician consultation ⇒ Pediatric Infectious Disease Consult Service ⇒ Page Peds ID On Call

E-mail: [peditricasp@stanford.edu](mailto:peditricasp@stanford.edu)

Antibiogram and dosing compiled by the Antimicrobial ASP, P&T Committee, Stanford Health Care Clinical Microbiology Laboratory, and Department of Pharmacy. Released 3/2025.

Gram Positive Cocci

2024 Isolates

Values expressed are % susceptible R = intrinsic resistance "-" = data not available

	Number of Isolates (a)	Beta-Lactams					Others												
		Oxacillin/Nafcillin (\$\$)	Penicillin or Ampicillin (\$)	1st Generation cephem (\$)	Cefuroxime (\$)	Ceftriaxone (\$)	Meropenem (\$\$\$)	Levofloxacin (\$\$)	Ciprofloxacin (b) (\$)	Clindamycin (c) (\$)	Erythromycin (\$\$\$)	Nitrofurantoin (b) (\$\$\$)	Trimethoprim/sulfa (\$)	Vancomycin (\$\$\$)	Tetracycline (\$\$)	Linezolid (\$\$\$\$)			
																	%S	%I	%R
Staphylococcus aureus	485	86	(d)	-	-	86	-	-	-	-	-	78	70	-	100	100	-	-	
MRSA only	65	0	0	-	-	-	-	-	-	-	-	62	26	-	100	100	89	100	
Staphylococcus lugdunensis	4(e)	100	(d)	-	-	100	-	-	-	-	-	75	100	-	100	100	-	-	
Staphylococcus spp., Coagulase-negative	53	28	(d)	-	-	28	-	-	-	-	-	58	29	-	64	100	-	-	
Enterococcus faecium	13(e)	-	46	-	54	R	R	R	-	-	-	50	R	-	29	R	100	-	100
Enterococcus faecalis	26(e)	-	100	-	0	R	R	R	-	-	-	R	-	-	R	100	-	-	
Streptococcus group B	22	-	100	0	0	-	-	-	-	-	-	41	-	-	-	-	-	-	
Viridans group Streptococci	33	-	70	16	11	-	-	97	-	-	-	85	-	79	49	-	-	100	-
Streptococcus pneumoniae	26(e)	-	65(f)	-	35	-	92	96(g)	92	-	-	81	73	-	65	100	Doxycycline	67	

(a) First isolate from each patient was included. (b) Urine only. (c) Testing for inducible clindamycin resistance performed on all Staphylococci, group B Strep, and S. pneumoniae. (d) Penicillin sensitivity confirmed by request. (e) Data from isolate totals <30 may be statistically unreliable. (f) Based on meningitis interpretive criteria (more conservative). Nonmeningitis interpretation is 96%. (g) Ceftriaxone uses the meningitis interpretive criteria (more conservative).

### Candida

Percent Susceptible By Broth Microdilution (YeastOne, Trek Diagnostics)	No. Tested	Amphotericin B (b) (\$\$\$)	Fluconazole (b) (\$)	Voriconazole (\$\$\$)	Caspofungin (c) (\$\$\$)
Candida albicans	17(d,e)	100	100/0	100	94
Candida glabrata	6(d,e)	100	0/100	-	100
Candida parapsilosis	14(d,e)	100	100/0	100	100
Other Candida species	4(d,e)	100	(f)	75	50

### Haemophilus influenzae

For infections with beta-lactamase producing H. influenzae: cefuroxime, ceftriaxone, trimethoprim/sulfamethoxazole, amoxicillin/clavulanate, or azithromycin is recommended. Ceftriaxone is drug of choice for CNS infections. At LPCH, 63% (n=30) of H. influenzae are ampicillin susceptible.

(a) Suggested Ampho Resistant breakpoint MIC > or = 2 mcg/ml. (b) Shows susceptible / susceptible-dose dependent. (c) Consult Peds ID if Caspofungin being considered for treatment. (d) Data from isolate totals <30 may be statistically unreliable. (e) Includes isolates from 2023. (f) Species other than C. krusei are 100% susceptible; C. krusei is intrinsically resistant to fluconazole.

\$ = \$0-20  
\$\$ = \$20-50  
\$\$\$ = \$50-100  
\$\$\$\$ = >\$100

## LPCHS Formulary Antimicrobials

### GENERAL INFORMATION

- The doses provided are general recommendations and do **NOT** include **neonatal dosing, cystic fibrosis dosing, or renal dose adjustment**.
- Please refer to the **Housestaff Manual (HSM)** or **Neofax** for additional recommendations and **indication-specific dosing**.
- Dosing for combination agents are based on the first ingredient listed (e.g., TMP/SMX dose recommendation of 6 mg/kg is based on TMP)
- Maximum individual doses in parentheses.
- Renal dose adjustment** parameters indicated by **superscript** (see HSM for renal dosing guideline):
  - <sup>1</sup> Adjustment needed if CrCl < 70 mL/min
  - <sup>2</sup> Adjustment needed if CrCl < 50 mL/min
  - <sup>3</sup> Adjustment needed if CrCl < 30 mL/min
- “Per Pharmacy” policies are established for aminoglycosides and vancomycin. These are “opt-in” policies ordered through Epic as “Per Pharmacy”.
- All inpatient restricted antimicrobial use, including continuation of home medications, requires Pediatric Infectious Disease (ID) approval, excluding maternity patients. Contact ID on-call for approval.
- All carbapenem use beyond 48 hours requires an ID consult, excluding maternity patients.
- For assistance, consult ASP or ID.

### ADDITIONAL RESOURCES

Please refer to the **HSM** for dosing and monitoring guidelines, including the following:

- ◇ “Aminoglycoside Guideline”
- ◇ “Antimicrobial Monitoring Guideline”
- ◇ “Azole Antifungal Monitoring Guidance”
- ◇ “Pediatric Renal Antibiotic Dosing Recommendations”
- ◇ Individual vancomycin dosing guidelines for pediatrics, cardiac surgery patients, obstetrics, and hemodialysis.

### ABBREVIATIONS

(ID) = Requires ID approval for use (please review HSM for process details and exclusions): **amphotericin B products; ceftazidime-avibactam; cidofovir; fosfarnet; isavuconazonium; linezolid; posaconazole; and, all non-formulary antimicrobials (e.g., daptomycin, nitazoxanide)**

(PI) = Prolonged infusion (i.e., extended infusion, continuous infusion) may be considered; use Epic order panel

(Px) = Prophylaxis; (Tx) = Treatment

(TDM) = Therapeutic drug monitoring recommended

(TMP/SMX) = Trimethoprim/sulfamethoxazole

PARENTERAL (IV) ANTIBIOTICS	
Amikacin <sup>2</sup> (per pharmacy)	7.5 mg/kg/dose q8h (500mg) 15—20 mg/kg/dose q24h (1.5g)
Ampicillin <sup>3</sup>	50—100 mg/kg/dose q6h (2g)
Ampicillin-sulbactam <sup>3</sup>	50 mg/kg/dose q6h (2g) (dose based on ampicillin)
Aztreonam <sup>3</sup>	30 mg/kg/dose q6h (2g)
Cefazolin <sup>3</sup>	16.5—50 mg/kg/dose q8h (2g)
Cefepime <sup>2</sup> (PI)	50 mg/kg/dose q8h (2g)
Cefoxitin <sup>2</sup>	40 mg/kg/dose q6-8h (2g)
Ceftazidime <sup>2</sup> (PI)	50 mg/kg/dose q8h (2g)
Ceftazidime-avibactam <sup>2</sup> (ID)	≥ 3 months: 50 mg/kg/dose q8h (2g)
Ceftriaxone	50—75 mg/kg/dose q24h (2g) Meningitis: 50 mg/kg/dose q12h (2g)
Ciprofloxacin <sup>3</sup>	15 mg/kg/dose q12h (400mg)
Clindamycin	7—13 mg/kg/dose q8h (900mg)
Doxycycline	2 mg/kg/dose q12h (100mg)
Gentamicin <sup>2</sup> (per pharmacy)	2—2.5 mg/kg/dose q8h 5—7.5 mg/kg/dose q24h Synergy: 1 mg/kg/dose q8h or 3 mg/kg/dose q24h
Levofloxacin <sup>3</sup>	<5yr: 8—10 mg/kg/dose q12h ≥5yr: 10 mg/kg/dose q24h (750mg)
Linezolid (ID)	<12yr: 10 mg/kg/dose q8h (600mg) ≥12 yr: 10 mg/kg/dose q12h (600mg)
Meropenem <sup>2</sup> (PI)	20 mg/kg/dose q8h (1g) Meningitis/CF: 40 mg/kg/dose q8h (2g)
Metronidazole	10 mg/kg/dose q8h (500mg) Appendicitis: 30 mg/kg/dose q24h (1g, unless >80kg, then 1.5g)
Nafcillin (PI)	33-50 mg/kg/dose q4-6h (2g)
Penicillin G <sup>2</sup>	25,000—100,000 units/kg/dose q4-6h (4million units)
Piperacillin-tazobactam <sup>2</sup> (PI)	<i>See age-specific HSM recommendations</i> 80—130 mg/kg/dose q6-8h (4g)
Tobramycin <sup>2</sup> (per pharmacy)	1—2.5 mg/kg/dose q8h 5—7.5 mg/kg/dose q24h

TMP-SMX <sup>3</sup> (dose based on trimethoprim)	Treatment: 3-6 mg/kg/dose q12h (160mg) <i>Stenotrophomonas/PJP</i> : 5 mg/kg/dose q8h (320mg)
Vancomycin <sup>2</sup> (per pharmacy)	15—20 mg/kg/dose q6-8h
ENTERAL (PO) ANTIBIOTICS	
Amoxicillin <sup>3</sup>	12.5—30 mg/kg/dose TID (1g) <i>S. pneumoniae</i> : 40—45 mg/kg/dose BID (2g)
Amoxicillin-clavulanate <sup>3</sup> [dose based on amoxicillin; note ratio of amoxicillin to clavulanate (e.g., 7:1)]	<i>See age-specific HSM recommendations and guideline</i> General dosing (7:1): 22.5 mg/kg/dose BID (875 mg) <i>S. pneumoniae</i> coverage (14:1 or 16:1): 40—45 mg/kg/dose BID (2g) Urinary tract infection (4:1): 13 mg/kg/dose TID (500 mg)
Azithromycin	10 mg/kg on day 1 (500mg), then 5 mg/kg (250mg) daily on days 2-5
Cefdinir <sup>3</sup>	14 mg/kg/dose daily (600mg)
Cephalexin <sup>3</sup>	12.5—50 mg/kg/dose TID-QID (1g)
Ciprofloxacin <sup>3</sup>	10—20 mg/kg/dose BID (750mg)
Clindamycin	7—10 mg/kg/dose TID (600mg)
Doxycycline	2 mg/kg/dose q12h (100mg)
Levofloxacin <sup>3</sup>	<5yr: 8—10 mg/kg/dose BID ≥5yr: 10 mg/kg/dose daily (750mg)
Linezolid (ID)	<12yr: 10 mg/kg/dose TID (600mg) ≥12yr: 10 mg/kg/dose BID (600mg)
Metronidazole	10 mg/kg/dose q8h (500mg)
Nitrofurantoin <sup>1</sup> (MacroBID®) Oral capsule	Treatment: 3.5 mg/kg/dose (50-mg increments) BID (100mg) Prophylaxis: 1—2 mg/kg/dose daily—BID (100mg)
Nitrofurantoin <sup>1</sup> (Macrodantin®) Oral suspension	Treatment: 1.25—2.5 mg/kg/dose QID (100mg) Prophylaxis: 1—2 mg/kg/dose daily—BID (100mg)
Penicillin VK	12.5 mg/kg/dose QID (500mg)
Rifampin	5-10 mg/kg/dose daily-TID (600mg)
TMP-SMX <sup>3</sup> (dose based on trimethoprim)	Tx: 3-6 mg/kg/dose BID (320mg) Px: 2-5mg/kg/dose daily (160mg)
Vancomycin	10 mg/kg/dose PO QID (125 mg; unless severe <i>C. difficile</i> , 500 mg)

ANTIFUNGALS	
Liposomal amphotericin (ID)	IV: 3—5 mg/kg/dose q24h
Caspofungin	Tx/Px: IV: Load 70 mg/m <sup>2</sup> once (70mg), then 50 mg/m <sup>2</sup> daily (50mg)
Fluconazole <sup>2</sup>	IV/PO: Loading dose 6—12 mg/kg/dose once, followed by 3—12 mg/kg/dose daily (800mg)
Isavuconazonium (ID) (TDM)	IV/PO: 10 mg/kg q8h x 6 doses, then 10 mg/kg daily (372 mg)
Posaconazole (ID) (TDM)	<i>See age-specific HSM recommendation</i> Tx/Px (tablet): 5-7 mg/kg/dose PO BID x 1 day, then 5-7 mg/kg/dose (50-mg increments) PO once daily (300 mg)
Voriconazole (TDM)	<i>See age-specific HSM recommendation</i> Tx/Px: IV/PO: 6—9 mg/kg/dose q12h x 2 doses, then by 3—9 mg/kg/dose q12h
ANTIVIRALS	
Acyclovir <sup>2</sup>	>70kg: <i>Use ideal body weight</i> Tx: IV: 10—15 mg/kg/dose q8h (800mg); PO: 15—20 mg/kg/dose 3-5x/day (800mg); hydration required Px: IV: 5 mg/kg/dose or 250 mg/m <sup>2</sup> q8h (300mg); PO: 10—15 mg/kg/dose TID (300mg)
Cidofovir (ID) <sup>1</sup>	1 mg/kg/dose IV 3 x/week or 5 mg/kg/dose once weekly (hydration required; +/- probenecid)
Foscarnet <sup>1</sup> (ID)	<i>Induction</i> Tx: 60—90 mg/kg/dose IV q12h
Ganciclovir <sup>1</sup>	<i>Induction</i> Tx: 5 mg/kg/dose IV q12h Px: 5 mg/kg/dose IV q24h
Oseltamivir <sup>3</sup>	Tx: 3—3.5 mg/kg/dose PO BID (75mg) Px: 3 mg/kg/dose daily (75mg)
Remdesivir	5 mg/kg IV (200 mg) x 1, then 2.5 mg/kg (100 mg) IV q24h
Valacyclovir <sup>2</sup>	Tx: 20 mg/kg/dose PO BID (1g) Px: 250—500 mg PO BID
Valganciclovir <sup>1</sup>	Tx: 12—20 mg/kg/dose PO BID (900mg) Px: 10—15 mg/kg/dose PO daily (900mg)