UCSF Benioff Children's Hospitals
Antimicrobial Dosing Guideline for Infants and Children > 1 Month of Age

Approved by Pharmacy and Therapeutics Committee (11/98) Last Update 4/2025

Antimicrobial Stewardship Program (ASP)	M-F 8:00 am to 4:30 pm for focused questions on antimicrobial selection, dose, monitoring, duration of therapy and for approvals (Voalte: Pediatric Antimicrobial Stewardship Team - ID/ASP Pharmacist or Provider)	Oak/SF: Contact via Voalte
Pediatric ID Consult Service	For cases requiring in depth review and physician consultation	
Online Resources	**Pediatric Empiric Antimicrobial Therapy Guidelines**, Clinical Pathways, Detailed Guidelines, Antimicrobial Susceptibility Profiles	idmp.ucsf.edu

Shaded boxes indicate ID-Restricted agents (**ID-R**). Other restricted agents are noted in APeX.
An approving clinician's ID number is needed to order a restricted agent. To obtain approval for a restricted agent, call Pediatric ASP between 8:30 am to 5:00 pm M-F. For off-hours approval (until 9:00 pm) contact the Pediatric ID Consult Service. From 9:00 pm to 8:00 am, use approval ID# 11111 for release of a single dose, then contact ASP for approval of subsequent doses.

For infants with renal dysfunction please use the neonatal antibiotic renal dosing reference

Dosing recommendations are for usual doses to treat the most common conditions.
For additional indication-specific dosing, or agents not included below, refer to the
Pediatric Empiric Antimicrobial Therapy Guidelines (EATG) (idmp.ucsf.edu), or **Lexi-Comp.**
Consult pharmacist or Lexidrug for renal dose adjustment.
For dosing in patients with Cystic Fibrosis (CF)
CKD EPI calculator CKiD U25 calculator

Drug	Usual Dose	Dose Adjustment	Maximum Dose
Acyclovir IV **Note: Use adjusted body weight for dosing in patients with obesity**	Mucocutaneous HSV Infection Immunocompetent Host ≥ 3 mo 5 mg/kg/dose q8h CNS HSV Infection >= 3 mo to < 12 yo 15 mg/kg/dose q8h CNS HSV >= 12 yo, HSV in Immunocompromised Host, or VZV Infection 10 mg/kg/dose q8h HSV Infection < 3 mo 20 mg/kg/dose q8h	Adjust for CrCl < 50 ml/min/1.73m^2	Usual Max 1000 mg/dose
	Acyclovir PO preferred for non-invasive infection in immunocompetent host > 3 months old – refer to Pediatric EATG or Lexi-Comp for dose		
Amphotericin B Liposomal IV [ID-R] **(Ambisome®)**	5 mg/kg/dose q24h	No recommended dose adjustment for renal dysfunction, but drug should be used with caution due to nephrotoxicity risk	None
Ampicillin IV	50 mg/kg/dose q6h Endocarditis, Meningitis: 400 mg/kg/day divided q4h to q6h	Adjust for CrCl < 50 ml/min/1.73m^2	2000 mg/dose
Ampicillin-sulbactam IV (Unasyn®)	50 mg ampicillin/kg/dose q6h	Adjust for CrCl < 30 ml/min/1.73m^2	Usual Max 2000 mg ampicillin/dose
Amoxicillin PO	22.5 mg/kg/dose bid High Dose (Pneumococcal) 45 mg/kg/dose bid Strep pharyngitis: 50 mg/kg/dose qday	Adjust for CrCl < 30 ml/min/1.73m^2	Usual Max 1000 mg/dose
Amoxicillin-clavulanate PO (Augmentin®)	< 3 mo: 15 mg amox/kg/dose bid (Use 250 mg/5 mL suspension) Standard Dose >= 3 mo 22.5 mg amox/kg/dose bid High Dose (Pneumococcal) >= 3 mo 45 mg amox/kg/dose bid	Adjust for CrCl < 30 ml/min/1.73m^2	Usual Max Susp: 840 mg/dose or 880 mg/dose depending on concentration Tablet: 875 mg/dose bid
Cefazolin IV	Mild-Moderate Infection 25 mg/kg/dose q8h Severe Infection 50 mg/kg/dose q8h	Adjust for CrCl < 50 ml/min/1.73m^2	Mild-Moderate 1000 mg/dose Severe 2000 mg/dose
Cephalexin PO	Mild-Moderate Infection 25 mg/kg/dose tid Severe Infection e.g. osteomyelitis/pyelonephritis 50 mg/kg/dose tid	Adjust for CrCl < 50 ml/min/1.73m^2	Mild-Moderate 500 mg/dose Severe 1000 mg/dose

Cefepime IV	50 mg/kg/dose q8h	Adjust for CrCl < 60 ml/min/1.73m^2	2000 mg/dose
Ceftazidime IV	50 mg/kg/dose q8h	Adjust for CrCl < 50 ml/min/1.73m^2	2000 mg/dose
Ceftriaxone IV	50 mg/kg/dose q24h Meningitis 50 mg/kg/dose q12h	No adjustment	2000 mg/dose
Ciprofloxacin IV/PO	Enteral: 15 mg/kg/dose enterally bid IV: 10 mg/kg/dose IV q8h	Adjust for CrCl < 30 ml/min/1.73m^2	750 mg enterally bid 400 mg IV q8h
Clindamycin IV/PO	10 mg/kg/dose q8h Bone/Joint Infection 13 mg/kg/dose q8h	No adjustment	Usual max Enteral: 600 mg/dose IV: 600 mg dose IV necrotizing fasciitis: 900 mg/dose
Fluconazole IV/PO	Invasive Candidiasis 12 mg/kg/dose q24h	Adjust for CrCl < 50 ml/min/1.73m^2	Usual max 800 mg q24h Varies by site and severity
Gentamicin IV **Note: Use adjusted body weight for dosing in patients with obesity** **Monitoring:** Oak: contact pharm for dosing adjustments SF: dosing per pharm	Synergy: 3 mg/kg/dose IV q24h Treatment < 3 mo OR < 52 weeks PMA: 5 mg/kg/dose IV q24h Treatment >= 3 mo AND >= 52 weeks PMA: 7 mg/kg/dose IV q24h	Adjust for CrCl < 50 ml/min/1.73m^2	Usual Max 1000 mg/dose
Levofloxacin IV/PO	6 mo to < 5 yo: 10 mg/kg/dose q12h >= 5 yo: 10 mg/kg/dose q24h	Adjust for CrCl < 30 ml/min/1.73m^2	750 mg/dose
Meropenem IV	20 mg/kg/dose q8h Meningitis 40 mg/kg/dose q8h	Adjust for CrCl < 50 ml/min/1.73m^2	2000 mg/dose
Metronidazole IV/PO	10 mg/kg/dose q8h Appendicitis 30 mg/kg/dose q24h	Adjust for CrCl < 10 ml/min/1.73m^2	500 mg/dose Appendicitis 1500 mg/dose
Nafcillin or Oxacillin IV	50 mg/kg/dose q6h	Adjust for concurrent hepatic and renal dysfunction	Individual Dose 2000 mg/DOSE Daily Dose 12,000 mg/DAY
Penicillin G IV (aqueous)	Mild-Moderate Infection 200,000 units/kg/day divided q4h Severe Infection eg endocarditis, meningitis 400,000 units/kg/day divided q4h	Adjust for CrCl < 10 ml/min/1.73m^2	4 million units/dose
Piperacillin/ Tazobactam IV (Zosyn®)	100 mg piperacillin/kg/dose q6h	Adjust for CrCl < 40 ml/min/1.73m^2	4000 mg piperacillin/dose

Tobramycin IV **Note: Use adjusted body weight for dosing in patients with obesity** **Monitoring:** Oak: contact pharm for dosing adjustments SF: dosing per pharm	Treatment < 3 mo OR < 52 weeks PMA: 5 mg/kg/dose IV q24h Treatment >= 3 mo AND >= 52 weeks PMA: 7 mg/kg/dose IV q24h	Adjust for CrCl < 50 ml/min/1.73m^2	None
TMP/SMX IV/PO (Bactrim®, Septra®)	Mild to Moderate Infection 5 mg/kg/dose TMP bid Serious Infection/PCP 5 mg/kg/dose TMP q6h to q8h	Adjust for CrCl < 30 ml/min/1.73m^2	Mild-Moderate 160 mg TMP/dose Severe Enteral: 320 mg TMP/dose IV: 480 mg TMP/dose
Vancomycin IV Oak: contact pharm for dosing adjustments SF: dosing per pharm	< 1 mo: Refer to Neonatal Dosing Guidelines 1 mo to < 3 mo (PMA 45 weeks to <= 52 weeks): 15 mg/kg/dose IV q8h >= 3 mo to < 12 yo: 17.5 mg/kg/dose IV q6h >= 12 yo to < 15 yo: 15 mg/kg/dose IV q6h >= 15 yo: 15 mg/kg/dose IV q8h	CICU/cardiac dysfunction initial dosing: < 6 months: 15 mg/kg/dose IV q12h >= 6 months: 15 mg/kg/dose IV q8h	Initial Max 1000 mg/dose
Voriconazole IV/PO **ID-R**	Empiric dosing if unknown pharmacogenomics (PGx): < 12 yo 10 mg/kg/dose enterally/IV bid >= 12 yo 6 mg/kg/dose enterally/IV bid Empiric dosing if known PGx	No adjustment for renal dysfunction but avoid IV formulation if CrCl < 50 ml/min/1.73m^2 Avoid if severe hepatic dysfunction	Initial Max: 400 mg/dose

Antibiotics in patients with Cystic Fibrosis (CF)

(If patient not responding on appropriate therapy, consider consulting ASP)

Drug	Suggested Dose	Usual Max Dose	Other Information
***Pseudomonas* (usually 2 antipseudomonal agents):** Tobramycin + Ceftazidime ***Pseudomonas* + *MSSA* :** Tobramycin + Cefepime			
Amikacin	30 mg/kg/dose IV q24h	Consider avoiding doses > 35 mg/kg/day	Requires Therapeutic Drug Monitoring Peak range: 35 to 45 mcg/mL Trough: < 5 mcg/mL
Aztreonam	50 mg/kg/dose IV q6h	2000 mg IV q6h	
Cefepime	50 mg/kg/dose IV q8h	2000 mg IV q8h	
Ceftazidime	50 mg/kg/dose IV q8h	2000 mg IV q8h	
Ciprofloxacin	10 mg/kg/dose IV q8h	400 mg IV q8h	
Piperacillin/Tazobactam (Zosyn®)	100 mg/kg/dose (piperacillin component) IV q6h	4000 mg (piperacillin component) IV q6h	
Meropenem	40 mg/kg/dose IV q8h	2000 mg IV q8h	
Tobramycin	10 mg/kg/dose IV q24h	Consider avoiding doses >15 mg/kg/dose	Requires Therapeutic Drug Monitoring Peak range: 20 to 35 mcg/mL Trough: < 1 mcg/mL
***Stenotrophomonas maltophilia*:**			
TMP/SMX IV/PO (Bactrim®, Septra®)	5 mg/kg/dose (TMP component) IV/PO tid/q8h	Enteral: 320 mg TMP/dose IV: 480 mg TMP/dose	Oral route preferred, if possible
***Staphylococcus aureus*:** The role of staph including MRSA is difficult to assess when a patient is also infected with pseudomonas, but it is often treated if present on recent or current cultures.			
Cefazolin	50 mg/kg/dose IV q8h	2000 mg IV q8h	
Doxycycline	5 mg/kg/day IV/PO bid/q12h	200 mg IV/PO bid/q12h	Oral route preferred, if possible
TMP/SMX IV/PO (Bactrim®, Septra®)	5 mg/kg/dose (TMP component) IV/PO tid/q8h	Enteral: 320 mg TMP/dose IV: 480 mg TMP/dose	Oral route preferred, if possible
Vancomycin **(Reserved for MRSA)** Oak: contact pharm for dosing adjustments SF: dosing per pharm	3 mo to < 12 yo: 17.5 mg/kg/dose IV q6h >= 12 yo to < 15 yo: 15 mg/kg/dose IV q6h >= 15 yo: 15 mg/kg/dose IV q8h	Initial Max 1000 mg/dose	Requires Therapeutic Drug Monitoring

G.) ***Antibiotic Therapeutic Drug Monitoring:***
Tobramycin

Extended-interval Dosing: Obtain post dose serum concentrations after the 1st dose

Renal Function	When to obtain level	After which dose?
CrCl > 50 or CRRT	Post dose levels 2 and 6 hours after end of infusion	1st dose
CrCl < 50	Post dose levels 2 and 12 hours after end of infusion	1st dose
HD or PD	Level obtained prior to the hemodialysis treatment is recommended to guide dosing	1st dose