# Department of Pharmacy/Antimicrobial Stewardship Program (June 2023)
# Antimicrobial Renal Dosing Guideline

| Antibiotic | Usual Dose (Normal Renal Function) | CrCl (ml/min) | Dosage Adjustment |
|---|---|---|---|
| **Acyclovir IV**<br>500 mg/vial | 5 (10*) mg/kg IV q8h<br>*Use 10 mg/kg for CNS infection or herpes zoster<br>Dose based on **ideal body wt** (not actual body wt), use **adjusted body wt** for BMI>30<br>^**Ensure adequate hydration to prevent AKI** | 25-50 | 5 (10*) mg/kg IV q12h |
| | | 10-24 | 5 (10*) mg/kg IV q24h |
| | | <10 or HD | 2.5 (5*) mg/kg IV q24h (give after HD on dialysis days, e.g. 10PM) |
| | | CRRT | 5 (10*) mg/kg IV q12-24h |

| **Aminoglycosides IV (Gentamicin, Tobramycin, Amikacin)**<br><br>Please see Aminoglycoside Dosing Guidelines for full recommendations (e.g. conventional dosing in special populations, dosage adjustments for renal replacement therapy, peak and trough monitoring, etc.) on Sanford Guide via intranet. | | **Gentamicin/Tobramycin** | **Amikacin** |
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| | **CrCl (ml/min)** | ***For all infections except UTI or synergy in staphylococcal/enterococcal infection*** | |
| | >60 | 5-7 mg/kg IV q24h | 15-20 mg/kg IV q24h |
| | >30-59 | 5-7 mg/kg IV q48h | 15-20 mg/kg IV q48h |
| | ≤30 | 1.5-2 mg/kg IV q24h | 5 mg/kg IV q24h |
| | HD | 1.5-2 mg/kg IV after HD | 5-7.5 mg/kg IV after HD |
| | | ***For UTI*** | |
| | >30 | 3 mg/kg IV q24h | 10 mg/kg IV q24h |
| | ≤30 | 1.5 mg/kg IV q24h | 5 mg/kg IV q24h |
| | HD | 1-1.5 mg/kg IV after HD | 5-7.5 mg/kg IV after HD |
| | | ***For synergy in staphylococcal or enterococcal infections (gentamicin only)*** | |
| | >60 | 1 mg/kg IV q8h | N/A |
| | >30-59 | 1 mg/kg IV q12h | |
| | 20-30 | 1mg/kg IV q24h | |
| | <20 | 1 mg/kg IV (Dose by level) | |
| | HD | 1 mg/kg IV after HD | |

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| **Amoxicillin/Clavulanate**<br>Tablet: 500 mg/125 mg, 875 mg/125 mg | 875mg PO q12h | 10-30 | 500 mg q12h |
| | | <10 or HD | 500 mg q24h (give after HD on dialysis days, e.g. 10PM) |
| **Ampicillin IV**<br>1 gm, 2 gm | 1-2 gm IV q6h | 10-30 | Normal dose IV q8h |
| | | <10 or HD | Normal dose IV q12h |
| | | CRRT | Normal dose IV q8-6h |
| | *2 gm IV q4h for Listeria meningitis, Enterococcal endocarditis | 30-<50 | 2 gm IV q6h |
| | | 10-<30 | 2 gm IV q8h |
| | | <10 or HD | 2 gm IV q12h |
| | | CRRT | 2 gm IV q6-4h |
| **Ampicillin/Sulbactam IV**<br>1.5 gm, 3 gm | 3 gm IV q6h | 15-29 | 3 gm IV q12h |
| | | <15 or HD | 3 gm IV q24h (give after HD on dialysis days, e.g. 10PM) |
| | | CRRT | 3 gm IV q8h |
| **Amphotericin B Liposomal (Ambisome),** 50 mg/vial | 3-5 mg/kg IV q24h | <10 | Normal dose IV q48h |
| | | HD | No dose adjustment |

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| **Artemether/Lumefantrine (Coartem)**<br>Tablet: Artemether 20 mg/ Lumefantrine 120 mg | 4 tablets (total artemether 80 mg/lumefantrine 480 mg ORALLY),<br>4 tablets again after 8 hours, then 4 tablets q12h for the next 2 days<br>(total course is 6 doses=24 tablets) | | No renal adjustment necessary |
| **Artesunate IV** | Please **contact ID pharmacist ASAP** if you are requesting Artesunate IV. Please see Malaria Treatment Guidelines for indication, dosing, and monitoring. | | |
| **Aztreonam IV**<br>1 gm, 2 gm | 1-2 gm IV q8h | 10-30 | Normal dose IV q12h |
| | | <10 or HD | Normal dose IV q24h (give after HD on dialysis days, e.g. 10PM) |
| | | CRRT | Normal dose IV q12h |
| **Cefazolin IV**<br>1 gm, 2 gm | 1-2 gm IV q8h | 10-35 | Normal dose IV q12h |
| | | <10 | 1 gm IV q24h |
| | | HD | 1 gm IV q24h (give after HD on dialysis days, e.g. 10PM)<br>or<br>2 gm/2 gm/3 gm IV after HD (M/W/F or T/Th/Sat) |
| | | CRRT | 2 gm IV q12h |
| **Cefdinir PO**<br>Capsule: 300 mg<br>Suspension: 50 mg/ml | 300 mg PO q12h | <30 or HD | 300 mg PO q24h (give after HD on dialysis days, e.g. 10PM) |
| **Cefepime IV**<br>1 gm, 2 gm | 1 gm IV q8h or 2 gm IV q12h | 10-29 | 1 gm IV q24h |
| | | HD | 1 gm IV q24h or 2 gm IV after HD*<br>**For stable patients or upon discharge for mild to moderate infections. This dosing strategy should NOT be used in severe infections (i.e. morbidly obese, sepsis, CNS infection, etc.)* |
| | | CRRT | 2 gm IV q12h |
| | 1 gm IV q6h (Pseudomonas with MIC < 4) | 30-50 | 1 gm IV q8h |
| | | 10-29 | 1 gm IV q12h |
| | | <10 or HD | 1 gm IV q24h (give after HD on dialysis days, e.g. 10PM) |
| | | CRRT | 1 gm IV q8h |
| | 2 gm IV q8h (Neutropenic Fever, Pseudomonas, CNS Infection) | 30-60 | 2 gm IV q12h |
| | | 10-29 | 1 gm IV q12h or 2 gm IV q24h |
| | | HD | 1-2 gm IV q24h (give after HD on dialysis days, e.g. 10PM) |
| | | CRRT | 2 gm IV q12h |
| **Cefiderocol IV**<br>1 gm, $228/vial | 2 gm IV q8h | >120 | 2 gm IV q6h |
| | | 30-60 | 1.5 gm IV q8h |
| | | 15-30 | 1 gm IV q8h |
| | | <15 | 750 mg IV q12h |

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| | | HD | 750 mg IV q12h |
| | | CRRT | 2 gm IV q12h |
| **Cefoxitin IV**<br>1 gm, 2 gm | 1-2 gm IV q8h | 10-29 | 1 gm IV q12h |
| | | <10 | 1 gm IV q24h |
| | | HD | 1 gm after HD (give after HD on dialysis days, e.g. 10PM) |
| **Ceftaroline IV**<br>400 mg, 600 mg, $116/vial | 600 mg IV q12h | 30-49 | 400 mg IV q12h |
| | | 15-29 | 300 mg IV q12h |
| | | <15 or HD | 200 mg IV q12h |
| | | CRRT | 400 mg IV q12h |
| | If susceptible-dose-dependent (SDD) with MIC 2-4 or persistent bacteremia, consider 600 mg IV q8h | 30-49 | 400 mg IV q8h |
| | | 15-29 | 300 mg IV q8h |
| | | <15 or HD | 200 mg IV q8h |
| | | CRRT | 400 mg IV q8h |
| **Ceftazidime/Avibactam IV (Avycaz)**<br>2.5 gm, $300/vial | 2.5 gm IV q8h | 31-50 | 1.25 gm IV q8h |
| | | <30, HD | 0.94 gm IV q12h |
| | | CRRT | 1.25-2.5 gm IV q8h |
| **Ceftolozane/Tazobactam IV (Zerbaxa)**<br>1.5 gm, $91/vial | 1.5 gm IV q8h | 30-50 | 750 mg IV q8h |
| | | 15-29 | 375 mg IV q8h |
| | | HD | 750 mg IV x 1, then 150 mg IV q8h |
| | | CRRT | 1.5 gm IV q8h |
| | For pneumonia: 3 gm IV q8h | 30-50 | 1.5 gm IV q8h |
| | | 15-29 | 750 mg IV q8h |
| | | HD | 2.25 gm IV x 1, then 450mg IV q8h |
| | | CRRT | 1.5 gm IV q8h |
| **Cefuroxime PO (Ceftin)**<br>Tablet: 250 mg, 500 mg | 500 mg PO q12h | 10-30 | 500 mg PO q24h |
| | | <10 | 500 mg PO q48h |
| | | HD | 500 mg after HD (give after HD on dialysis days, e.g. 10PM) |
| **Cephalexin PO**<br>Capsule: 250 mg, 500 mg<br>Suspension: 50 mg/ml | 500 mg PO q6h or 1 gm PO q8h | 10-29 | 500 mg PO q8h or 1 gm PO q12h |
| | | <10 | 500 mg PO q12h |
| | | HD | 500 mg PO q24h (give after HD on dialysis days, e.g. 10PM) |
| **Cidofovir IV**<br>375 mg/vial, $441/vial | 5 mg/kg IV once weekly x 2 weeks, then 5 mg/kg IV every other week and give with saline hydration and probenecid 2 gm PO 3 hrs before and 1 gm at 2 hrs and 8 hrs after (total 4 gm)<br><br>**Low dose:** 0.5-1 mg/kg IV weekly (BK virus), probenecid is optional<br><br>Dose based on **actual body wt**, use **adjusted body wt** for BMI>30 | CKD or ESRD | 3 mg/kg IV every other week |

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| | **Intravesicular** instillation: 5mg/kg once a week in 60 ml normal saline instill through a foley catheter over 15 min and clamp for 1 hr. | No renal adjustment needed | |
| **Ciprofloxacin IV, PO**<br>Tablet: 250 mg, 500 mg<br>IV: 200 mg, 400mg | 400 mg IV q12h (q8h-Pseudomonas) | <30 or HD | 400 mg IV q24h |
| | | CRRT | 400 mg IV q8-12h |
| | 500 mg PO q12h (750mg-Pseudomonas) | <30 or HD | 500 mg PO q24h (give after HD on dialysis days, e.g. 10PM) |
| | | CRRT | 500 mg PO q12h |
| **Daptomycin IV**<br>500 mg/vial, $301/vial | 4 mg/kg IV q24h (SSTI, UTI)<br>8-10 mg/kg IV q24h (bacteremia/endocarditis)<br><br>*Enterococcal bacteremia/endocarditis: start 8 mg/kg IV q24h | <30 | Normal dose IV q48h |
| | | HD | Normal dose IV q48h after HD (give after HD on dialysis days, e.g. 10PM) |
| | | CRRT | Normal dose IV q24h |
| **Fluconazole IV, PO**<br>Tablet: 50 mg, 100 mg, 200 mg;<br>IV: 100 mg, 200 mg, 400 mg | 100-400* mg IV/PO q24h<br><br>Susceptible-dose-dependent (SDD) *C. glabrata*: 800 mg IV/PO q24h<br><br>*Consider giving loading dose (2 x normal dose) as first dose if severe infection (max dose 800 mg) | <50 | 50% of normal dose IV/PO q24h |
| | | HD | 50% of normal dose IV/PO q24h (give after HD on dialysis days, e.g. 10PM) |
| | | CRRT | 400 mg IV/PO q24h |
| | | **Note:** 150 mg x 1 dose for vaginal candidiasis or 100 mg/day – no renal adjustment necessary | |
| **Flucytosine PO**<br>Capsule: 250mg, 500mg | 25 mg/kg PO q6h<br>Dose based on **ideal body wt** | 20-40 | Normal dose PO q12h |
| | | 10-20 | Normal dose PO q24h |
| | | <10 | Normal dose PO q48h |
| | | HD | 25-50 mg/kg/dose PO q48h |
| **Foscarnet IV**<br>6 gm/vial, $221/vial | **Induction:** 90 mg/kg IV q12h<br><br>**Maintenance:** 90 mg/kg IV q24h<br><br>Dose based on **actual body wt**, use **adjusted body wt** for BMI>30<br><br>**^Ensure adequate hydration to prevent AKI** | **CrCl (ml/min/kg)** | **Induction** / **Maintenance** |
| | | >1-1.4 | 70 mg/kg IV q12h / 70 mg/kg IV q24h |
| | | >0.8-1 | 50 mg/kg IV q12h / 50 mg /kg IV q24h |
| | | >0.6-0.8 | 80 mg/kg IV q24h / 80 mg/kg IV q48h |
| | | >0.5-0.6 | 60 mg/kg IV q24h / 60 mg/kg IV q48h |
| | | ≥0.4-0.5 | 50 mg/kg IV q24h / 50 mg/kg IV q48h |
| | | <0.4 | No data / No data |
| | | HD | 45-60 mg/kg/dose after HD days |
| **Ganciclovir IV**<br>500 mg/vial | **Induction:** 5 mg/kg IV q12h*<br><br>**Maintenance or Prophylaxis:** 5 mg/kg IV q24h<br><br>*High dose induction: 10 mg/kg IV q12h for low level CMV resistant strain with UL97 mutation, EC 50 < 5 x normal<br><br>Dose based on **actual body wt**, use **adjusted body wt** for BMI>30 | | **Induction** / **Maintenance or Prophylaxis** |
| | | 50-69 | 2.5 mg/kg IV q12h / 2.5 mg/kg IV q24h |
| | | 25-49 | 2.5 mg/kg IV q24h / 1.25 mg/kg IV q24h |
| | | 10-24 | 1.25 mg/kg IVq24h / 0.625 mg/kg IV q24h |
| | | HD | 1.25 mg/kg IV after HD / 0.625 mg/kg IV after HD |
| | | CVVH | 2.5 mg/kg IV q24h / 1.25 mg/kg IV q24h |

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| | | CVVHD, CVVHDF | 2.5 mg/kg IV q12h | 2.5 mg/kg IV q24h |
| **Imipenem/Cilastatin/ Relebactam IV**<br>1.25 gm, $330/vial | 1.25 gm IV q6h | 60-89 | 1 gm IV q6h | |
| | | 30-59 | 750 mg IV q6h | |
| | | 15-29 | 500 mg IV q6h | |
| | | <15 on HD | 500 mg IV q6h | |
| **IVIG**<br>2.5 g, 5 g, 10 g, 20 g, 40 g<br>$77/g (i.e. $2000-5500/dose for a 70kg patient) | Toxic shock (GAS, MRSA): 1 g/kg IV on day 1, 0.5 g/kg IV on days 2 and 3<br>Last resort *C. difficile* colitis: 400 mg/kg IV once<br>Measles post-exposure for high-risk patient: 400 mg/kg IV once<br>(Use **ideal body wt** for dosing, use **adjusted body wt** for BMI>30; round the dose to the nearest 5 g) | | | |
| **Levofloxacin IV, PO**<br>Tablet: 500 mg, 750mg<br>IV: 500 mg, 750mg | 750 mg IV/PO q24h<br>** 500mg IV/PO q24h (if CrCl<20, use q48h) for prophylaxis regimens ** | 20-49 | 750mg IV/PO q48h | |
| | | 10-19, HD | 750 mg IV/PO x1, then 500mg IV/PO q48h | |
| | | CRRT | 750mg IV/PO q48h | |
| **Meropenem IV**<br>500 mg, 1 gm | 500 mg IV q6h | 31-49 | 500 mg IV q8h | |
| | | ≤30 | 500 mg IV q12h | |
| | | ≤10 or HD | 500 mg IV q24h (give after HD on dialysis days, e.g. 10PM) | |
| | | CRRT | 1 gm IV q12h | |
| | 2 gm IV q8h (Meningitis, intermediate sensitivity of carbapenem) | 31-49 | 1 gm IV q8h | |
| | | ≤30 | 1 gm IV q12h | |
| | | ≤10 or HD | 1 gm IV q24h (give after HD on dialysis days, e.g. 10PM) | |
| | | CRRT | 1 gm IV q8h | |
| **Oseltamivir PO**<br>Capsule: 75 mg, 30 mg<br>Suspension: 6 mg/ml | **Treatment:** 75 mg PO q12h<br>**Prophylaxis:** 75 mg PO daily | | **Treatment** | **Prophylaxis** |
| | | 30-60 | 30 mg PO q12h | 30 mg PO daily |
| | | <30 | 30 mg PO daily | 30 mg PO q48h |
| | | HD | 30 mg PO after HD | 30 mg PO after every other HD session |
| **Penicillin G IV**<br>Sodium salt: 5 million units<br>Potassium salt: 1, 2, 3, 5 million units | 3-4 million units IV q4h | 10-50 | Normal dose IV q8h-q6h | |
| | | <10 or HD | Normal dose IV q12h | |
| | | CRRT | 4 million units IV x1, then normal dose IVq6-4h (Maximum dose: 20 million units) | |
| **Piperacillin/Tazobactam IV**<br>4.5 gm, 2.25 gm | **Standard 4-hour Extended Infusion** (Preferred for all indications)<br>4.5 gm IV q8h | <20 or HD | 4.5 gm IV q12h | |
| | | CRRT | 4.5 gm IV q8h | |
| | **Limited IV Access: 30-minute Infusion**<br>(*Pseudomonas*, nosocomial pneumonia, or organism MIC 16)<br>4.5 gm IV q6h | 20-40 | 4.5 gm IV q8h | |
| | | <20 or HD | 4.5 gm IV q12h | |
| | | CRRT | 4.5 gm IV q8h | |

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| | **Limited IV Access: 30-minute Infusion**<br>4.5 gm IV q6h (All other indications)<br>4.5 gm IV q8h | <20 or HD | 4.5 gm IV q12h |
| | | CRRT | 4.5 gm IV q8h |
| **Polymyxin B IV**<br>500,000 units/vial | 12,500 units/kg IV q12h<br>(Use total body wt if < 100 kg or adjusted body wt if > 100 kg)<br>Single maximum dose: 1.5 million units | | No renal adjustment necessary<br>Monitor Cr, urine output |
| **Ribavirin for RSV, PO**<br>Capsule: 200 mg | 20 mg/kg/day PO divided in 2-3 doses<br>Maximum dose: 1800 mg/day<br>(Monitor Hgb closely) | <30 | Normal dose PO q12-24h |
| **Sulfamethoxazole/ Trimethoprim IV, PO**<br>SS: trimethoprim 80 mg<br>DS: trimethoprim 160 mg | Dose based on trimethoprim component<br>UTI/SSTI: 1DS (160 mg) - 2DS (320mg) PO q12h<br>PCP: 15 mg/kg/day IV/PO divided in q8-6h<br>Serious systemic infection: 5 mg/kg IV/PO q12h | 10-30 or HD | UTI/SSTI: 1DS (160 mg) PO q24h<br>PCP: 5-7.5 mg/kg/day IV/PO divided in q12-24h<br>Others: 5 mg/kg/day IV/PO q24h |
| | | CRRT | No dosage adjustment required |

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| **Valganciclovir**<br>tablet: 900 mg, 450 mg | **Induction:** 900 mg PO q12h<br>**Maintenance:** 900 mg PO q24h<br>**Prophylaxis**: 450 mg PO q12h or 900 mg PO q24h | | **Induction** | **Maintenance or Prophylaxis** |
| | | 40-59 | 450 mg PO | 450 mg PO q24h |
| | | 25-39 | 450 mg PO | 450 mg PO q48h |
| | | 10-24 | 450 mg PO | 450 mg PO twice weekly |
| | | HD | 450 mg PO | 450mg PO after HD |

| | | | **Creatinine Clearance (ml/min) Estimated by CG Equation** | | | | | | | |
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| | | | ≥30-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 | 90-99 | ≥100 |
| **Vancomycin IV**<br>**(This nomogram is for dose initiation only. Do not use this nomogram if patient has AKI or is on dialysis)**<br><br>Please see Vancomycin Dosing Guidelines for full recommendations (e.g. dosing in HD, monitoring, etc.) on Sanford Guide via intranet.<br><br>****Patients with CrCl < 30 and actual body weight (ABW) less than 50kg, consider dosing vancomycin by level** | **Actual Body Weight (kg)** | 50-59 | 1g q24h | 1g q24h | 1g q24h | 0.75g q12h | 0.75g q12h | 1g q12h | 1g q12h | 1g q12h |
| | | 60-69 | 1g q24h | 1g q24h | 1g q24h | 0.75g q12h | 1g q12h | 1g q12h | 1g q12h | 1g q12h |
| | | 70-79 | 1g q24h | 1g q24h | 1g q12h | 1g q12h | 1g q12h | 1g q12h | 1g q12h | 1g q8h |
| | | 80-89 | 1g q24h | 1g q24h | 1g q12h | 1g q12h | 1g q12h | 1g q12h | 1g q8h | 1g q8h |
| | | 90-99 | 1g q24h | 1.5g q24h | 1g q12h | 1g q12h | 1g q12h | 1g q8h | 1g q8h | 1g q8h |
| | | 100-109 | 1.5g q24h | 1.5g q24h | 1g q12h | 1g q12h | 1g q8h | 1g q8h | 1g q8h | 1g q8h |
| | | 110-119 | 1.5g q24h | 1.5g q24h | 1g q12h | 1g q12h | 1g q8h | 1g q8h | 1g q8h | 1g q6h |
| | | 120-129 | 1.5g q24h | 1g q12h | 1g q12h | 1g q8h | 1g q8h | 1g q8h | 1g q6h | 1g q6h |
| | | 130-130 | 1.5g q24h | 1g q12h | 1g q12h | 1g q8h | 1g q8h | 1g q8h | 1g q6h | 1g q6h |
| | | 140-150 | 1.5g q24h | 1g q12h | 1g q12h | 1g q8h | 1g q8h | 1g q6h | 1g q6h | 1g q6h |

| Antibiotics that Do NOT Require Renal Adjustment | | | |
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| Azithromycin | Dicloxacillin | Metronidazole | Posaconazole (dosing for delayed release tablet and suspension formulations are NOT interchangeable) |
| Ceftriaxone | Doxycycline | Micafungin | |
| Chloramphenicol | Eravacycline | Nafcillin/Oxacillin | |
| Clindamycin | Linezolid | Voriconazole | |

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