Antimicrobial Dosing in Renal Insufficiency (Adults)

*** In patients on hemodialysis (HD), give antimicrobial immediately after dialysis on dialysis days.**
HD = Intermittent hemodialysis
PD = Peritoneal dialysis
CVVHDF = Continuous veno-venous hemodiafiltration

Drug	Typical Dose	CrCl (mL/min)	Dose adjustment for renal insufficiency
Acyclovir PO (HSV)	400 mg TID	>10 <10 or HD PD	400 mg TID 400 mg BID * 400 mg BID
Acyclovir PO (VZV)	800 mg 5x daily	>25 10-25 <10 or HD PD	800 mg 5x daily 800 mg TID 800 mg BID * 800 mg BID
Acyclovir IV	10 mg/kg q8h *Dose by ideal body weight if BMI 30 or greater.*	>50 25-50 10-24 <10 or HD CVVHDF PD	10 mg/kg q8h 10 mg/kg q12h 10 mg/kg q24h 5 mg/kg q24h * 10 mg/kg q12h 5 mg/kg q24h
Amoxicillin PO	500-1000 mg PO TID	>30 10-30 <10 or HD PD	500-1000 mg PO TID 500 mg PO BID 500 mg PO BID 500 mg PO BID
Amoxicillin-clavulanate PO (Clavulin)	500-125 mg one tab TID 875-125 mg one tab BID	>30 10-30 <10 or HD PD >30 <30	500-125 mg one tab TID 500-125 mg one tab BID 500-125 mg one tab BID * 500-125 mg one tab BID 875-125 mg one tab BID AVOID: use 500-125 mg tab
Amphotericin B	0.3-1.0 mg/kg IV q24h	No dose adjustment	No dose adjustment
Amphotericin B liposomal	3-5 mg/kg IV q24h	No dose adjustment	No dose adjustment
Ampicillin IV *Standard dose*	1 g q6h	>10 <10 or HD CVVHDF PD	1 g q6h 1 g q12h * 1 g q8h 1 g q12h
Ampicillin IV *High dose*	2 g q4h	>50 10-50 <10 or HD CVVHDF PD	2 g q4h 2 g q6h 2 g q12h * 2 g q6h 1 g q12h
Azithromycin PO/IV	250-500 mg q24h	No dose adjustment	No dose adjustment
Cefazolin IV	1-2 g q8h	≥35 10-34 <10 HD CVVHDF	1-2 g q8h 1-2 g q12h 1 g q24h 1 g q24h or 2 g qHD * 2 g q12h

Drug	Typical Dose	CrCl (mL/min)	Dose adjustment for renal insufficiency
		PD	500 mg q12h
Cefixime PO	400 mg daily	≥30 <30 or HD PD	400 mg daily 200 mg daily * 200 mg daily
Cefotaxime IV	2 g q8h	>25 10-25 <10 or HD CVVHD PD	2 g q8h 2 g q12h 2 g q24h * 2 g q8h 1 g q24h
Cefoxitin IV	2 g q6h	>50 25-50 10-24 <10 or HD CVVHDF PD	2 g q6h 2 g q8h 2 g q12h 2 g q24h* 2 g q12h 1 g q24h
Ceftazidime IV	2 g q8h	>50 10-50 <10 HD CVVHDF PD	2 g q8h 2 g q12-24h 2 g q24-48h 2 g qHD* 2 g q12h 1 g once, then 500 mg q24h
Ceftriaxone IV *Standard dose*	1-2 g q24h	No dose adjustment	No dose adjustment
Ceftriaxone IV *Central nervous system infection*	2 g q12h	No dose adjustment	No dose adjustment
Cefuroxime PO	500 mg BID to TID	No dose adjustment	No dose adjustment
Cefuroxime IV	750 mg q8h	>20 10-20 <10 or HD CVVHDF PD	750 mg q8h 750 mg q12h 750 mg q24h * 1 g q12h 750 mg q24h
Cephalexin PO	500 mg QID	>30 10-30 <10 or HD PD	500 mg QID 500 mg TID 500 mg BID * 500 mg BID
Ciprofloxacin PO	500-750 mg BID	>30 10-30 <10 HD PD	500-750 mg BID 500-750 mg daily 250-500 mg daily 500-750 mg daily * 500-750 mg daily
Ciprofloxacin IV	400 mg q8-12h	≥30 <30 or HD CVVHDF PD	400 mg q8-12h 400 mg q24h * 400 mg q12h 400 mg q24h
Clarithromycin PO/IV	500 mg BID	≥30 <30 or HD CVVHDF	500 mg BID 500 mg daily * 500 mg BID

Drug	Typical Dose	CrCl (mL/min)	Dose adjustment for renal insufficiency
		PD	500 mg daily
Clindamycin PO	300-450 mg QID or 450-600 mg TID	No dose adjustment	No dose adjustment
Clindamycin IV	600-900 mg q8h	No dose adjustment	No dose adjustment
Cloxacillin PO	500 mg QID	No dose adjustment	No dose adjustment
Cloxacillin IV	2 g q4h	No dose adjustment	No dose adjustment
Cotrimoxazole PO *Routine indications* DS: TMP 160mg SS: TMP 80mg	1-2 DS tab BID	>30 ≤30 HD PD	1-2 DS tab BID 1-2 DS tab daily 1-2 DS tab daily * 1 SS to 1 DS tab BID
Cotrimoxazole IV *High dose therapy* (Dosing based on TMP component)	5 mg/kg q6h	>30 10-30 <10 or HD CVVHDF PD	5 mg/kg q6h 5 mg/kg q12h 5-10 mg/kg q24h * 5-10 mg/kg q12h 5-10 mg/kg q24h
Daptomycin IV	4-6 mg/kg q24h	≥30 <30 HD CVVHDF PD	4-6 mg/kg q24h 4-6 mg/kg q48h 4-6 mg/kg qHD * *Consider increasing dose by 50% after dialysis on 72 hr intradialytic day* 4-6 mg/kg q24h 4-6 mg/kg q48h
Doxycycline PO/IV	100 mg BID	No dose adjustment	No dose adjustment
Ertapenem IV	1 g q24h	>30 ≤30 or HD CVVHDF PD	1 g q24h 500 mg q24h * 1 g q24h 500 mg q24h
Erythromycin PO	500 mg QID	No dose adjustment	No dose adjustment
Fluconazole PO/IV	100-400 mg daily	>30 ≤30 HD CVVHDF PD	100-400 mg daily 100-200 mg daily 100-400 mg daily * 400-800 mg daily 100-200 mg daily
Ganciclovir IV *Treatment/induction dose*	5 mg/kg q12h	≥70 50-69 25-49 10-24 <10 HD CVVHDF	5 mg/kg q12h 2.5 mg/kg q12h 2.5 mg/kg q24h 1.25 mg/kg q24h 1.25 mg/kg 3 times weekly 1.25 mg/kg qHD * 2.5 mg/kg q12h
Ganciclovir IV *Prophylaxis/maintenance dose*	5 mg/kg q24h	≥70 50-69 25-49 10-24 <10 HD	5 mg/kg q24h 2.5 mg/kg q24h 1.25 mg/kg q24h 0.625 mg/kg q24h 0.625 mg/kg 3 times weekly 0.625 mg/kg qHD *

Drug	Typical Dose	CrCl (mL/min)	Dose adjustment for renal insufficiency
		CVVHDF	2.5 mg/kg q24h
Imipenem IV	500 mg q6h	≥70 30-70 21-30 <20 or HD CVVHDF PD	500 mg q6h 500 mg q6-8h 500 mg q8-12h 250-500 mg q12h * 1000 mg load, then 500 mg q6h 250 mg q12h
Levofloxacin PO/IV	750 mg q24h	≥50 20-49 <20 HD CVVHDF PD	750 mg q24h 750 mg q48h 750 mg load, then 500 mg q48h 750 mg load, then 500 mg qHD 750 mg q24h 750 mg load, then 500 mg q48h
Linezolid PO/IV	600 mg BID	No dose adjustment	No dose adjustment *
Meropenem IV *Standard dose*	500 mg q6h	≥50 25-49 10-24 <10 or HD CVVHDF PD	500 mg q6h 500 mg q8h 500 mg q12h 500 mg q24h * 500 mg q6h 500 mg q24h
Meropenem IV *High dose*	2000 mg q8h	>50 10-50 <10 or HD CVVHDF PD	2000 mg q8h 2000 mg q12h 2000 mg q24h * 1000 mg q8h 2000 mg q24h
Metronidazole PO/IV	500 mg BID-TID	No dose adjustment	No dose adjustment
Micafungin IV	100 mg IV q24h	No dose adjustment	No dose adjustment
Moxifloxacin PO/IV	400 mg daily	No dose adjustment	No dose adjustment
Nitrofurantoin PO (MacroBID)	100 mg BID	≥30 <30	100 mg BID AVOID
Oseltamivir PO *Influenza treatment*	75 mg BID x 5 days	>60 30-60 10-30 <10 IHD (low-flux) IHD (high-flux) CVVHDF PD	75 mg BID 30 mg BID 30 mg daily 75 mg once 30 mg qHD 75 mg qHD 30 mg daily 30 mg once
Oseltamivir PO *Influenza prophylaxis*	75 mg daily x 10 days *May be extended in certain circumstances.*	>60 30-60 10-30 IHD (low-flux) IHD (high-flux)	75 mg daily 30 mg daily 30 mg every other day 30 mg after alternate dialysis sessions No data

Drug	Typical Dose	CrCl (mL/min)	Dose adjustment for renal insufficiency
		PD	30 mg once or qWeekly
Penicillin VK PO	600 mg QID	No dose adjustment	No dose adjustment
Penicillin G IV	2-4 million units q4h	>50 10-50 <10 or HD CVVHDF PD	2-4 million units q4h 3 million units q4h 1-2 million units q4h 2-4 million units q4h 4 million units q12h
Piperacillin-tazobactam *Standard dose*	3.375 g q6h	>40 20-40 <20 HD CVVHDF PD	3.375 g q6h 2.25 g q6h 2.25 g q8h 2.25 g q12h * 3.375 g q6h 2.25 g q12h
Piperacillin-tazobactam *Pseudomonas*	4.5 g q6h	>40 20-40 <20 HD CVVHDF PD	4.5 g q6h 3.375 g q6h 2.25 g q6h 2.25 g q8h * 3.375 g q6h 2.25 g q8h
Tetracycline PO	500 mg QID	>80 50-80 10-50 <10 or HD CVVHDF PD	500 mg QID 500 mg TID 500 mg BID AVOID AVOID AVOID
Tigecycline	100 mg once, then 50 mg q12h	No dose adjustment	No dose adjustment
Valacyclovir PO (HSV)	500 mg BID	≥10 <10 or HD CVVHDF PD	500 mg BID 500 mg daily * 500 mg daily 500 mg daily
Valacyclovir PO (VZV)	1 g TID	>30 10-30 <10 HD CVVHDF PD	1 g TID 1 g BID 500 mg daily 1 g daily * 1 g q12-24h 1 g daily
Valganciclovir PO *Treatment/induction dose*	900 mg q12h	≥60 40-59 25-39 10-24 <10 or HD	900 mg q12h 450 mg q12h 450 mg q24h 450 mg q48h 200 mg 3 times weekly
Valganciclovir PO *Prophylaxis/maintenance dose*	900 mg q24h	≥60 40-59 25-39 10-24 <10 or HD	900 mg q24h 450 mg q24h 450 mg q48h 450 mg twice weekly 100 mg 3 times weekly

Drug	Typical Dose	CrCl (mL/min)	Dose adjustment for renal insufficiency
Vancomycin IV	See "Vancomycin Dosing and Therapeutic Monitoring" in ASP Handbook		
Vancomycin PO	125 mg QID For *C. difficile* only.	No dose adjustment	No dose adjustment
Voriconazole PO	400 mg PO BID x 2 doses, then 200-300 mg BID *May require dose adjustment if low body weight*	No dose adjustment	No dose adjustment
Voriconazole IV	6 mg/kg q12h x 2 doses, then 4 mg/kg q12h	≥50 <50	No dose adjustment No dose adjustment, switch to oral formulation as soon as feasible. IV voriconazole contains cyclodextrin which can accumulate and cause toxicity

References:

1. Lexicomp Online, 2017
2. Sanford Guide to Antimicrobial Therapy, 2017
3. Li PK et al. ISPD Guidelines/Recommendations – ISPD peritonitis recommendations: 2016 update on prevention and treatment. Peritoneal dialysis international 2016;36:481-508.