

**Table 6. Dosing Recommendations for Drugs Used to Treat or Prevent Opportunistic Infections that Require Dosage Adjustment in Patients with Renal Insufficiency**

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When renally cleared drugs are administered to patients with reduced renal function, drug accumulation leading to supratherapeutic concentrations and drug toxicities is a primary concern. However, clearance is only one of the pharmacokinetic parameters that affect a drug's disposition. The volume of distribution of a drug also can be altered in patients with reduced renal function. Furthermore, some patients with HIV or diabetes mellitus can have reduced oral absorption of certain drugs. Therefore, although a drug may require a dose reduction in renal failure based on reduced clearance (i.e., increased concentrations), other factors—such as an increased volume of distribution or reduced oral absorption—may decrease concentrations.

Therapeutic drug monitoring (TDM), if available and appropriate, may facilitate dose adjustments in these complicated patients. TDM allows the clinician to make informed, individualized decisions about dose adjustments that are more precise than standardized dose adjustments based on estimated creatinine clearance. Drugs that are marked with an asterisk (\*) in the table below are known to have assays (for clinical and/or research purposes) available within the United States and typically in Europe as well. When TDM is appropriate, clinicians should contact their clinical laboratory to determine assay availability and turnaround time for their institution.

Drug(s)	Usual Dose	Dosage Adjustment in Renal Insufficiency	
		CrCl <sup>^</sup> or eGFR <sup>#</sup> (mL/min)	Dose
Acyclovir*	<b>IV Dose</b> <i>Serious HSV</i> • 5 mg/kg IV every 8 hours  <i>VZV Infections or HSV encephalitis</i> • 10 mg/kg IV every 8 hours	26–50	100% of dose IV every 12 hours
		10–25	100% of dose IV every 24 hours
		<10	50% of dose IV every 24 hours
		HD	50% of dose every 24 hours; administer dose after HD on days of dialysis.
	<b>PO Dose for Herpes Zoster:</b> 800 mg PO five times per day	10–25	800 mg PO every 8 hours
		<10	800 mg PO every 12 hours
		HD	800 mg PO every 12 hours; administer dose after HD on days of dialysis
Adefovir	10 mg PO every 24 hours	30–49	10 mg PO every 48 hours
		10–29	10 mg PO every 72 hours

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Drug(s)	Usual Dose	Dosage Adjustment in Renal Insufficiency	
		CrCl <sup>^</sup> or eGFR <sup>#</sup> (mL/min)	Dose
		HD	10 mg PO weekly; administer dose after HD
<b>Amikacin*</b> For mycobacterial infections	IV 15 mg/kg per day  or  25 mg/kg three times per week	Use with caution in patients with renal insufficiency and family history of ototoxicity.	15 mg/kg two to three times per week  Perform TDM to adjust dose, with target peak concentration 35–45 mcg/mL and trough concentration <4 mcg/mL.  Administer dose after HD on days of dialysis.
<b>Amphotericin B*</b>	3–6 mg/kg IV per day (lipid formulation)  or  0.7–1.0 mg/kg IV per day (amphotericin B deoxycholate)	N/A	No dosage adjustment necessary; consider alternative antifungals if renal insufficiency occurs during therapy despite adequate hydration.
<b>Cidofovir</b>	5 mg/kg IV on Day 0, repeat 5 mg/kg IV dose on Day 7, then 5 mg/kg IV every 2 weeks  Give each dose with probenecid and saline hydration (see <a href="#">Table 2</a> for dosing instructions).	Pretreatment SCr >1.5 mg/dL  or  CrCl ≤55 mL/min  or  Proteinuria ≥100 mg/dL (≥2 +)	Cidofovir is <b>not recommended</b> unless benefits outweigh risks. See <a href="#">"Pharmacokinetics of cidofovir in renal insufficiency and in continuous ambulatory peritoneal dialysis or high-flux hemodialysis"</a> for recommendations on renal dose adjustments.
		If SCr increases by 0.3–0.4 mg/dL above baseline	Decrease to 3 mg/kg IV per dose.
		If SCr increases >0.5 mg/dL above baseline  or  Proteinuria ≥3 +	Discontinue therapy.
<b>Ciprofloxacin*</b>	500–750 mg PO every 12 hours  or  400 mg IV every 8–12 hours	30–50	500–750 mg PO every 12 hours  or  400 mg IV every 12 hours
		<30	250–500 mg PO every 24 hours

**Table 6. Dosing Recommendations for Drugs Used to Treat or Prevent Opportunistic Infections That Require Dosage Adjustment in Patients with Renal Insufficiency**

Drug(s)	Usual Dose	Dosage Adjustment in Renal Insufficiency		
		CrCl <sup>^</sup> or eGFR <sup>#</sup> (mL/min)	Dose	
			<i>or</i> 400 mg IV every 24 hours	
		HD or PD	250–500 mg PO every 24 hours <i>or</i> 200–400 mg IV every 24 hours; administer after HD or PD on days of dialysis.	
Clarithromycin <sup>*</sup>	500 mg PO every 12 hours	30–60	Usual dose unless used with an HIV PI or with COBI, then reduce dose by 50%.	
		<30	250 mg PO twice daily <i>or</i> 500 mg PO once daily  If used with an HIV PI or COBI, reduce dose by 75% (or consider using azithromycin as alternative).	
Cycloserine <sup>*</sup>	10–15 mg/kg/day PO in two divided doses (maximum 1,000 mg/day); start at 250 mg once daily and increase dose per tolerability.  Target peak concentration 20–35 mcg/mL	30–80	Usual dose; consider TDM and monitor for toxicities.	
		<30 (not on HD) or HD	250 mg once daily or 500 mg three times per week  Perform TDM and adjust dose accordingly. Monitor for toxicities.  Use with caution in patients with ESRD who are not on dialysis.	
Emtricitabine <sup>a</sup> (FTC)	One 200-mg capsule PO once daily  <i>or</i> 240-mg solution PO once daily	CrCl <sup>^</sup> or eGFR <sup>#</sup> (mL/min)	Oral Capsules	Oral Solution
		15–29	200 mg every 72 hours	80 mg every 24 hours
		<15 and not on HD	200 mg every 96 hours	60 mg every 24 hours
		HD (administer dose after HD on days of dialysis)	200 mg every 24 hours	240 mg every 24 hours

**Table 6. Dosing Recommendations for Drugs Used to Treat or Prevent Opportunistic Infections That Require Dosage Adjustment in Patients with Renal Insufficiency**

Drug(s)	Usual Dose	Dosage Adjustment in Renal Insufficiency		
		CrCl <sup>^</sup> or eGFR <sup>#</sup> (mL/min)	Dose	
<b>Emtricitabine<sup>*</sup>/Tenofovir<sup>*</sup> Alafenamide (FTC/TAF)</b> (FDC Trade Name: Descovy)  <b>Note:</b> Please refer to product labels for dosing recommendations for other ARV FDC products containing FTC/TAF.	One tablet (FTC 200 mg/TAF 25 mg) PO once daily	<30 and not on HD	Coformulated tablet is <b>not recommended</b> .	
		HD	One tablet daily. Administer dose after HD on days of dialysis.	
<b>Emtricitabine<sup>*</sup>/Tenofovir<sup>*</sup> Disoproxil Fumarate (FTC/TDF)</b> (FDC Trade Name: Truvada)  <b>Note:</b> Please refer to product labels for dosing recommendations for other ARV FDC products containing FTC/TDF.	One (FTC 200 mg/TDF 300 mg) tablet PO daily	30–49	One tablet PO every 48 hours (monitor for worsening renal function or consider switching to TAF)	
		<30 or HD	<b>Do not use coformulated tablet.</b>  Use formulation for each component drug and adjust dose according to recommendations for the individual drugs.	
<b>Entecavir</b>  <b>Usual Dose:</b> 0.5 mg PO once daily  <b>For Treatment of 3TC-Refractory HBV or for Patients with Decompensated Liver Disease:</b> 1 mg PO once daily		CrCl <sup>^</sup> or eGFR <sup>#</sup> (mL/min)	Usual Renal Dose Adjustment	3TC-Refractory or Decompensated Liver Disease
		30 to <50	<ul style="list-style-type: none"> <li>0.25 mg PO every 24 hours, <i>or</i></li> <li>0.5 mg PO every 48 hours</li> </ul>	<ul style="list-style-type: none"> <li>0.5 mg PO every 24 hours, <i>or</i></li> <li>1 mg PO every 48 hours</li> </ul>
		10 to <30	<ul style="list-style-type: none"> <li>0.15 mg PO every 24 hours, <i>or</i></li> <li>0.5 mg PO every 72 hours</li> </ul>	<ul style="list-style-type: none"> <li>0.3 mg PO every 24 hours, <i>or</i></li> <li>1 mg PO every 72 hours</li> </ul>

**Table 6. Dosing Recommendations for Drugs Used to Treat or Prevent Opportunistic Infections That Require Dosage Adjustment in Patients with Renal Insufficiency**

Drug(s)	Usual Dose	Dosage Adjustment in Renal Insufficiency	
		CrCl <sup>^</sup> or eGFR <sup>#</sup> (mL/min)	Dose
		<10 or HD or CAPD (administer after HD on days of dialysis)	<ul style="list-style-type: none"> <li>• 0.05 mg PO every 24 hours, <i>or</i></li> <li>• 0.5 mg PO once every 7 days</li> <li>• 0.1 mg PO every 24 hours, <i>or</i></li> <li>• 1 mg PO once every 7 days</li> </ul>
Ethambutol <sup>*</sup>	<b>For MAI:</b> 15 mg/kg PO daily  <b>For MTB:</b> 15–25 mg/kg PO daily  (See the Dosing Recommendations table in the <a href="#">Mycobacterium tuberculosis section</a> for additional MTB dosing recommendations.)	<30 or HD	Usual dose PO three times weekly (in patients on HD, give dose after dialysis).
		PD	Do not use in patients on PD. Consider alternative MAI or MTB treatment (e.g., moxifloxacin).  Perform TDM to guide optimal dosing.
Ethionamide <sup>*</sup>	15–20 mg/kg PO daily (usually 250–500 mg PO once or twice daily)	<30 or HD	250–500 mg PO once daily  Consider TDM.
Famciclovir <sup>*</sup>	<b>For Herpes Zoster:</b> 500 mg PO every 8 hours  <b>For HSV:</b> 500 mg PO every 12 hours	40–59	500 mg PO every 12 hours
		20–39	500 mg PO every 24 hours
		<20	250 mg PO every 24 hours
		HD	250 mg PO only on HD days, administer after HD
Fluconazole <sup>*</sup>	200–1,200 mg PO or IV every 24 hours (dose and route of administration depends on type of OI)	≤50	Administer 100% of the indication-specific initial dose, then adjust maintenance doses to 50% of dose every 24 hours.
		HD	Administer 100% of the indication-specific initial dose, then adjust maintenance doses to full dose three times per week after HD.
Flucytosine <sup>*</sup>	25 mg/kg PO every 6 hours  TDM is recommended for patients to guide optimal dosing (target peak serum concentration 2 hours after dose: 25–100 mcg/mL). If TDM is not possible, monitor CBC twice weekly.	21–40	25 mg/kg PO every 12 hours
		10–20	25 mg/kg PO every 24 hours
		<10	25 mg/kg PO every 48 hours
		HD	25–50 mg/kg PO every 48–72 hours; administer dose after HD.

**Table 6. Dosing Recommendations for Drugs Used to Treat or Prevent Opportunistic Infections That Require Dosage Adjustment in Patients with Renal Insufficiency**

Drug(s)	Usual Dose	Dosage Adjustment in Renal Insufficiency	
		CrCl <sup>a</sup> or eGFR <sup>#</sup> (mL/min)	Dose
Foscarnet	<b>Induction Therapy for CMV Infection:</b> 180 mg/kg/day IV in two divided doses	Dosage adjustment needed according to calculated CrCl/kg; consult product label for dosing table.	Dosage adjustment needed according to calculated CrCl/kg; consult product label for dosing table.
	<b>Maintenance Therapy for CMV Infection or for Treatment of HSV Infections:</b> 90–120 mg/kg IV once daily		
Ganciclovir <sup>*</sup>	<b>Induction Therapy:</b> 5 mg/kg IV every 12 hours	50–69	2.5 mg/kg IV every 12 hours
		25–49	2.5 mg/kg IV every 24 hours
		10–24	1.25 mg/kg IV every 24 hours
		<10 or HD	1.25 mg/kg IV three times per week; administer dose after HD.
	<b>Maintenance Therapy:</b> 5 mg/kg IV every 24 hours	50–69	2.5 mg/kg IV every 24 hours
		25–49	1.25 mg/kg IV every 24 hours
		10–24	0.625 mg/kg IV every 24 hours
		<10 or HD	0.625 mg/kg IV three times per week; administer dose after HD.
Lamivudine <sup>b</sup> (3TC)	300 mg PO every 24 hours	15–29	150 mg PO once, then 100 mg PO every 24 hours
		5–14	150 mg PO once, then 50 mg PO every 24 hours
		<5 or HD	50 mg PO once, then 25 mg PO every 24 hours; administer dose after HD on days of dialysis.
Lamivudine/ Tenofovir Disoproxil Fumarate (3TC/TDF)  (FDC Trade Names: Cimduo or Temixys)  <b>Note:</b> Please refer to product information for dosing recommendations for other ARV FDC	One (3TC 300 mg/TDF 300 mg) tablet PO every 24 hours	<50	Coformulated tablet is <b>not recommended</b> .

**Table 6. Dosing Recommendations for Drugs Used to Treat or Prevent Opportunistic Infections That Require Dosage Adjustment in Patients with Renal Insufficiency**

Drug(s)	Usual Dose	Dosage Adjustment in Renal Insufficiency		
		CrCl <sup>^</sup> or eGFR <sup>#</sup> (mL/min)	Dose	
products containing 3TC/TDF.				
Levofloxacin <sup>*</sup>	500 mg (low dose) or 750–1,000 mg (high dose) IV or PO daily	CrCl <sup>^</sup> or eGFR <sup>#</sup> (mL/min)	Low Dose	High Dose
		20–49	500 mg once, then 250 mg every 24 hours, IV or PO	750 mg every 48 hours IV or PO
		<20 or CAPD or HD (administer dose after HD on days of dialysis)	500 mg once, then 250 mg every 48 hours, IV or PO  Dose can be adjusted based on serum concentrations.	750 mg once, then 500 mg every 48 hours, IV or PO
Paromomycin	500 mg PO every 6 hours	<10	Minimal systemic absorption. No dosage adjustment necessary but monitor for worsening renal function and ototoxicity in patients with ESRD.	
Peginterferon Alfa-2a	180 mcg SQ once weekly	<30	135 mcg SQ once weekly	
		HD	135 mcg SQ once weekly  May reduce to 90 mcg once weekly if severe adverse effects or laboratory abnormalities occur.	
Penicillin G (Potassium or Sodium)	<b>Neurosyphilis, Ocular Syphilis, or Ootosyphilis</b> <ul style="list-style-type: none"> <li>3–4 million units IV every 4 hours, <i>or</i></li> <li>18–24 million units IV daily as continuous infusion</li> </ul>	10–50	2–3 million units every 4 hours <i>or</i> 12–18 million units as continuous infusion	
		<10	2 million units every 4–6 hours, <i>or</i> 8–12 million units as continuous infusion	
		HD or CAPD	2 million units every 4–6 hours, <i>or</i> 8 million units as continuous infusion	
Pentamidine	4 mg/kg IV every 24 hours  May reduce dose to 3 mg/kg IV daily in the event of toxicities	<10	4 mg/kg IV every 48 hours	
Posaconazole <sup>*</sup>	<b>IV:</b> 300 mg twice daily on Day 1; then 300 mg once daily  <b>Delayed-Release Tablet:</b> 300 mg PO once daily	<50	No dosage adjustment of oral dose in patients with renal insufficiency. Higher variability in serum concentrations observed in patients with CrCl <20 mL/min.  Perform posaconazole TDM (target trough concentration at least >1.25 mcg/mL for treatment).	

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Drug(s)	Usual Dose	Dosage Adjustment in Renal Insufficiency	
		CrCl <sup>^</sup> or eGFR <sup>#</sup> (mL/min)	Dose
	Oral Suspension: 400 mg PO twice daily		IV posaconazole is <b>not recommended</b> by the manufacturer because of potential toxicity due to accumulation of SBCD (vehicle of IV product). However, an observational study did not find worsening in renal function in patients with CrCl <50 mL/min given SBCD.  Switch patients with CrCl <50 mL/min to oral posaconazole when feasible.
Pyrazinamide <sup>*</sup>	See the <a href="#">Mycobacterium tuberculosis section</a> for weight-based dosing guidelines.	<30 or HD	25–35 mg/kg/dose three times per week; administer dose after HD.
Quinine Sulfate <sup>*</sup>	650 mg salt (524 mg base) PO every 8 hours	<10 or HD	650 mg once, then 325 mg PO every 12 hours
Rifabutin <sup>*</sup>	5 mg/kg PO daily (usually 300 mg PO daily)  See the <a href="#">Mycobacterium tuberculosis section</a> and <a href="#">Drug–Drug Interactions</a> in the Adult and Adolescent Antiretroviral Guidelines for dosage adjustment based on interactions with ARVs.	<30	If toxicity is suspected, consider 50% of dose once daily and perform rifabutin TDM.
Sofosbuvir <sup>*</sup>	400 mg PO daily	<30	<b>Not recommended.</b> Up to 20-fold higher sofosbuvir metabolite observed in patients with this level of renal impairment.
Streptomycin	15 mg/kg IM or IV every 24 hours  or  25 mg/kg IM or IV three times per week	Use with caution in patients with renal insufficiency.	TDM is no longer available. Consider an alternative aminoglycoside, as clinically appropriate. If used: 15 mg/kg two to three times weekly. Administer dose after HD.
Sulfadiazine	1,000–1,500 mg PO every 6 hours (1,500 mg every 6 hours for patients >60 kg)	≤ 50	No data. Use alternative anti-toxoplasma therapy.
Tecovirimat	IV:  35 to <120 kg: 200 mg every 12 hours	30–89	No dosage adjustment necessary  Use with caution due to potential accumulation of hydroxypropyl-β-cyclodextrin.



**Table 6. Dosing Recommendations for Drugs Used to Treat or Prevent Opportunistic Infections That Require Dosage Adjustment in Patients with Renal Insufficiency**

Drug(s)	Usual Dose	Dosage Adjustment in Renal Insufficiency	
		CrCl <sup>^</sup> or eGFR <sup>#</sup> (mL/min)	Dose
	≥120 kg: 300 mg every 12 hours	<30	<b>Contraindicated</b> due to potential accumulation of hydroxypropyl-β-cyclodextrin.  <b>Note:</b> IV formulation may be considered in patients with CrCl <30 <b>only</b> if drug absorption via enteral administration is expected to be problematic based on an individual risk-benefit assessment in consultation with CDC. In these circumstances, use with caution and monitor renal function continuously. Switch to the oral formulation as soon as possible.
	PO: 40 to <120 kg: 600 mg every 12 hours ≥120 kg: 600 mg every 8 hours	Any eGFR	No dosage adjustment necessary
Tenofovir <sup>*</sup> Alafenamide (TAF)  <b>Note:</b> Please refer to product labels for dosing recommendations for other ARV FDC products containing FTC/TAF.	25 mg PO daily	<15	<b>Not recommended</b>
		<15 on HD	No dosage adjustment required. Administer dose after HD on days of dialysis.
Tenofovir <sup>*</sup> Disoproxil Fumarate (TDF)  <b>Note:</b> Please refer to product labels for dosing recommendations for other ARV FDC products containing TDF.	300 mg PO daily	30–49	300 mg PO every 48 hours (consider switching to TAF for treatment of HBV)
		10–29	300 mg PO every 72–96 hours (consider switching to alternative agent for treatment of HBV)
		<10 and not on dialysis	<b>Not recommended</b>
		HD	300 mg PO once weekly; administer dose after dialysis
Trimethoprim <sup>*</sup> / Sulfamethoxazole (TMP-SMX)	For PCP Treatment • 5 mg/kg (of TMP component) IV every 6–8 hours, <i>or</i>	15–30	5 mg/kg (TMP) IV every 12 hours, or two TMP-SMX DS tablets PO every 12 hours
		<15	5 mg/kg (TMP) IV every 24 hours, or one TMP-SMX DS tablet PO every 12 hours (or two TMP-SMX DS tablets every 24 hours)

**Table 6. Dosing Recommendations for Drugs Used to Treat or Prevent Opportunistic Infections That Require Dosage Adjustment in Patients with Renal Insufficiency**

Drug(s)	Usual Dose	Dosage Adjustment in Renal Insufficiency	
		CrCl <sup>^</sup> or eGFR <sup>#</sup> (mL/min)	Dose
	<ul style="list-style-type: none"> <li>Two TMP-SMX DS tablets PO every 8 hours</li> </ul>	HD	5 mg/kg/day (TMP) IV, or two TMP-SMX DS tablets PO daily; administer dose after HD on days of dialysis.  Consider TDM to optimize therapy (target TMP concentrations: 5–8 mcg/mL).
	<b>For PCP Prophylaxis</b>	15–30	Reduce dose by 50% (e.g., 1 SS tablet PO daily).
	<ul style="list-style-type: none"> <li>One TMP-SMX DS tablet PO daily,</li> <li>One TMP-SMX DS tablet PO three times per week, <i>or</i></li> <li>One TMP-SMX SS tablet PO daily</li> </ul>	<15	Reduce dose by 50% or use alternative agent.
	<b>For Toxoplasmosis Encephalitis (TE)</b> <b>Treatment:</b> 5 mg/kg (TMP component) IV or PO every 12 hours	15–30	5 mg/kg (TMP component) IV or PO every 24 hours
		<15	5 mg/kg (TMP component) IV or PO every 24 hours or use alternative agent
	<b>For TE Chronic Maintenance Therapy</b> <ul style="list-style-type: none"> <li>One TMP-SMX DS tablet twice daily, <i>or</i></li> <li>One TMP-SMX DS tablet daily</li> </ul>	15–30	Reduce dose by 50%.
		<15	Reduce dose by 50% or use alternative agent.
	<b>For Toxoplasmosis Primary Prophylaxis:</b> One TMP-SMX DS tablet PO daily	15–30	Reduce dose by 50%.
		<15	Reduce dose by 50% or use alternative agent.
	<b>Valacyclovir<sup>*</sup></b> <b>For Herpes Zoster:</b> 1 g PO three times daily	30–49	1 g PO every 12 hours
		10–29	1 g PO every 24 hours
		<10	500 mg PO every 24 hours
		HD	500 mg PO every 24 hours; administer dose after HD on days of dialysis.
		30–49	No dosage adjustment
		10–29	<b>For Treatment:</b> 1 g PO every 24 hours

**Table 6. Dosing Recommendations for Drugs Used to Treat or Prevent Opportunistic Infections That Require Dosage Adjustment in Patients with Renal Insufficiency**

Drug(s)	Usual Dose	Dosage Adjustment in Renal Insufficiency		
		CrCl <sup>^</sup> or eGFR <sup>#</sup> (mL/min)	Dose	
	For Herpes Simplex Virus Treatment: 1 g PO twice daily		For Suppressive Therapy: 500 mg PO every 24 hours	
	For Herpes Simplex Chronic Suppressive Therapy: 500 mg PO twice daily	<10	500 mg PO every 24 hours	
		HD	500 mg PO every 24 hours; administer dose after HD on days of dialysis.	
Valganciclovir	Induction Therapy: 900 mg PO twice daily  Maintenance Therapy: 900 mg PO once daily	CrCl <sup>^</sup> or eGFR <sup>#</sup> (mL/min)	Induction	Maintenance
		40–59	450 mg PO twice daily	450 mg PO daily
		26–39	450 mg PO daily	450 mg PO every 48 hours
		10–25	450 mg PO every 48 hours	450 mg PO twice weekly
		<10 and not on dialysis	Not recommended  Use IV ganciclovir.  May consider: • 200 mg (oral powder for solution) PO three times per week  If oral powder formulation is not available, consider: • 450 mg (tablet) PO three times weekly	Not recommended  Use IV ganciclovir.  May consider: • 100 mg (oral powder for solution) PO three times per week  If oral powder formulation is not available, consider: • 450 mg (tablet) PO twice weekly
		HD	Not recommended  Use IV ganciclovir.  May consider: • 200 mg (oral powder for solution) PO three times per week after HD  If oral powder formulation is not available, may consider: • 450 mg (tablet) PO three times per week after HD	Not recommended  Use IV ganciclovir.  May consider: • 100 mg (oral powder for solution) PO three times per week after HD  If oral powder formulation is not available, may consider: • 450 mg (tablet) PO twice per week after HD

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Drug(s)	Usual Dose	Dosage Adjustment in Renal Insufficiency	
		CrCl <sup>a</sup> or eGFR <sup>#</sup> (mL/min)	Dose
Voriconazole <sup>*</sup>	6 mg/kg IV every 12 hours for two doses, then 4 mg/kg IV every 12 hours  or  200–300 mg PO every 12 hours	<50	IV voriconazole is <b>not recommended</b> by the manufacturer because of potential toxicity due to accumulation of SBCD (vehicle of IV product). An observational study did not find worsening in renal function in patients with CrCl <50 mL/min.  Switch patients with CrCl <50 mL/min to oral voriconazole when feasible. No need for dosage adjustment when the oral dose is used.  Perform TDM to adjust dose.

\* Drugs marked with asterisk (\*) are those known to have assays available (for clinical and/or research purposes) within the United States and typically in Europe. When TDM is appropriate, clinicians should contact their clinical laboratory to determine assay availability and turnaround time for their institution.

<sup>a</sup> The prescribing information for emtricitabine (Emtriva) recommends adjusting doses for patients with CrCl 30–49 and for patients on hemodialysis. However, the prescribing information for several FDC products that contain emtricitabine (including Descovy, Biktarvy, Genvoya, and Odefsey) recommends that the standard dose (emtricitabine 200 mg) can be given once daily in these patients (on days of hemodialysis, give after completion of dialysis). The recommendations in this table incorporate the dosing guidance from the FDC products.

<sup>b</sup> The prescribing information for lamivudine (Epivir) recommends dosage adjustment from 300 mg once daily to 150 mg once daily for patients with CrCl 30–49 mL/min. However, the prescribing information for several FDC products that contain lamivudine (including Epzicom, Dovato, and Triumeq) recommends no dose adjustment for CrCl 30–49 mL/min. The recommendation in this table incorporates the dosing guidance from the FDC products.

<sup>a</sup> Creatinine Clearance Calculation	
Male:  $\frac{(140 - \text{age in years}) \times \text{weight in kg}}{72 \times \text{serum creatinine}}$	Female:  $\frac{(140 - \text{age in years}) \times \text{weight in kg} \times 0.85}{72 \times \text{serum creatinine}}$

<sup>#</sup>When estimating kidney function to facilitate drug dosing in patients with renal insufficiency, please refer to the drug's prescribing information and to the National Institute of Diabetes and Digestive and Kidney Diseases' [Determining Drug Dosing in Adults with Chronic Kidney Disease](#) page for a discussion on using CrCl based on the Cockcroft-Gault equation versus eGFR.

**Key:** 3TC = lamivudine; ARV = antiretroviral; CAPD = continuous ambulatory peritoneal dialysis; CBC = complete blood count; CMV = cytomegalovirus; COBI = cobicistat; CrCl = creatinine clearance; DS = double strength; eGFR = estimated glomerular filtration rate; ESRD = end-stage renal disease; FDC = fixed-dose combination; FTC = emtricitabine; HBV = hepatitis B virus; HD = hemodialysis; HSV = herpes simplex virus; IM = intramuscular; IV = intravenous; MAI = *Mycobacterium avium* intracellulare; MTB = *Mycobacterium tuberculosis*; N/A = not applicable; OI = opportunistic infection; PCP = *Pneumocystis* pneumonia; PD = peritoneal dialysis; PI = protease inhibitor; PO = orally; SCr = serum creatinine; SQ = subcutaneous; SBCD = sulfobutylether cyclodextrin; SS = single strength; TAF = tenofovir alafenamide; TDF = tenofovir disoproxil fumarate; TDM = therapeutic drug monitoring; TMP-SMX = trimethoprim-sulfamethoxazole; VZV = varicella zoster virus