

## Renal Dosage Adjustment Guidelines for Antimicrobials

The pharmacists will automatically adjust the doses of any of the antimicrobials included in the protocol according to the estimated creatinine clearance (generally using the Cockcroft-Gault equation for patients  $\geq 18$  years old and the Schwartz equation for patients  $< 18$  years old). This protocol does NOT include patients in the neonatal intensive care unit. For other pediatric patients less than 1 year of age the pharmacist must discuss the dose adjustment with the medical team who initiated the order. When a change is necessary, the pharmacist will modify the order in Epic and enter it as “Per protocol: cosign required”.

The adjustments listed in the dosing guidelines will be made unless the physician writes “Do not adjust” when ordering the antimicrobial. For vancomycin and the aminoglycosides, a pharmacokinetic consult will be performed by the pharmacist in accordance with IP 009 (Pharmacokinetics Service Policy).

The most current version of the Renal Dosage Adjustment Guidelines for Antimicrobials and associated antimicrobial policies can be found online at the Antimicrobial Stewardship Program (ASP) website: [www.nebraskamed.com/asp](http://www.nebraskamed.com/asp). **A separate guideline for renal adjustments in patients receiving continuous renal replacement therapy (CRRT) can be found on the ASP website.**

### Please note:

- If there are no clear recommendations available, the pharmacist will not perform any automatic dosage adjustment but will consult with the ordering physician.
- Accurate estimation of creatinine clearance and glomerular filtration rate from the Cockcroft-Gault and Schwartz equations require serum creatinine concentrations to be at steady-state. Acute changes in renal function (indicated by changes in urine output & serum creatinine) render the Cockcroft-Gault and Schwartz equations unreliable as serum creatinine is a delayed indicator of renal function. Furthermore, CrCl calculations may be significantly overestimated in patients with decreased muscle mass (e.g. elderly, paralysis). The pharmacist should use their clinical judgment regarding these changes and communicate their recommendations with the team as appropriate.
- Inclusion of an agent within this guideline does not necessarily indicate Nebraska Medicine formulary status.

## Creatinine Clearance Estimation

### Adults:

Cockcroft-Gault equation:

$$\text{CrCl (mL/min)} = \frac{(140 - \text{age}) * \text{IBW}}{72 * \text{Scr}} \times 0.85 \text{ (for females only)}$$

Scr Serum creatinine concentration in mg/dL  
([Note](#) that it is no longer customary to round Scr to 1 in the elderly)

IBW Ideal body weight  
Males =  $50 + (2.3 \times \text{inches} > 5 \text{ feet})$   
Females =  $45.5 + (2.3 \times \text{inches} > 5 \text{ feet})$

Use actual body weight if less than ideal body weight  
Use [adjusted body weight](#) (AdjBW) if actual body weight is > 120% of ideal body weight

Adjusted body weight = ideal body weight +  $0.4(\text{actual body weight} - \text{ideal body weight})$

### Pediatrics:

Schwartz's equation:

$$\text{CrCl (mL/min)} = K \times L / \text{Scr}$$

K Constant of proportionality that is age specific

Age	K
Preterm infants up to 1 year	0.33
Full-term infants up to 1 year	0.45
1-12 years	0.55
13-17 years female	0.55
13-17 years male	0.70

L Length or height in cm

Scr Serum creatinine concentration in mg/dL

*\*\*Please note that One Chart uses the Cockcroft-Gault equation to determine the estimated creatinine clearance for patients  $\geq 18$  years (following the same rules for body weight and rounding of Scr) and the Schwartz equation for patients < 18 years old.*



## Antimicrobial Dosing Recommendations

Antimicrobial	Normal Dose	Renal Dosage Adjustment Based on CrCl Estimate (in mL/min)*
Acyclovir	<p><u>Adult</u>  <u>PO</u>            200 mg PO 5x/day</p> <p>400 mg PO 5x/day</p> <p>800 mg PO 5x/day</p> <p>400 mg PO q12h</p> <p><u>IV</u>  <u>Mucocutaneous:</u>            5 mg/kg (<a href="#">AdjBW</a>) IV q8h</p> <p><i>HSV encephalitis or varicella zoster virus:</i>            10 mg/kg (<a href="#">AdjBW</a>) IV q8h</p> <p>-----</p> <p><u>Pediatric</u>  <u>PO</u>            6.25-20 mg/kg PO q6h</p> <p><u>IV</u>            15-20 mg/kg IV q8h</p>	<p>CrCl 0-10: Same dose q12h</p> <p>CrCl 11-25: Same dose q8h            CrCl 0-10: Same dose q12h</p> <p>CrCl 11-25: Same dose q8h            CrCl 0-10: Same dose q12h</p> <p>CrCl 0-10: 200 mg q12h</p> <p>CrCl 25-50: Same dose q12h            CrCl 10-24: Same dose q24h            CrCl &lt;10: 2.5-3.1 mg/kg IV q24h</p> <p>CrCl 25-50: Same dose q12h            CrCl 10-24: Same dose q24h            CrCl &lt;10: 5-6.2 mg/kg IV q24h</p> <p>HD: Dose as CrCl &lt;10; give dose daily, after HD on dialysis days            CAPD: Dose as CrCl &lt;10</p> <p>-----</p> <p>CrCl 10-25: Same dose q8h            CrCl &lt;10: Same dose q12h</p> <p>CrCl 25-50: Same dose q12h            CrCl 10-24: Same dose q24h            CrCl &lt;10: 50% IV q24h<sup>†</sup></p> <p>HD/CAPD: No data</p>
Amantadine	<p><u>Adult</u>            100 mg PO q12h or 200 mg daily</p> <p>-----</p>	<p>CrCl 30-50: 200 mg on day 1, then 100 mg/day            CrCl 15-29: 200 mg on day 1, then 100 mg on alternate days            CrCl &lt;15: 200 mg every 7 days</p> <p>HD: 200 mg every 7 days            CAPD: No supplemental dose needed</p> <p>-----</p>



	<p><u>Pediatric</u>  1-9 years:  5 mg/kg/day PO in 2 divided doses  (max dose 150 mg/day)</p> <p>≥10 years and &lt; 40 kg:  5 mg/kg/day PO in 2 divided doses  (max dose 150 mg/day)</p> <p>≥10 years and ≥40 kg:  100 mg PO q12h</p>	No clear recommendations
<p>Amikacin</p> <p>Refer to PK training packet on ASP website<sup>§</sup></p>	<p><u>Adult</u>  <i>Extended interval dosing:</i>  15 mg/kg (AdjBW) IV q24h most infections</p> <p>20 mg/kg (AdjBW) IV q24h <a href="#">nosocomial pneumonia</a>, especially with multi-drug resistance and young (&lt; 40 years old) or trauma patients</p> <p>10 mg/kg/day IV may be used for UTIs</p> <p>(Refer to PK training packet on ASP website for exclusions to extended-interval dosing)</p> <p>15 mg/kg IV three times weekly for <a href="#">Mycobacterial infections</a></p> <p>-----  <i>Traditional dosing (typically not needed):</i>  7.5 mg/kg IV q12h</p> <p>Monitoring of serum levels is recommended</p> <p>-----  <u>Pediatric</u>  <i>Traditional dosing:</i>  5 mg/kg IV q8h</p>	<p><i>Extended interval dosing:</i>  Frequency adjusted by serum level 6-14 hours after start of infusion and Hartford nomogram (modified for Amikacin)</p> <p>-----  CrCl &gt;50-90: Consider dose adjustment by 20-25% (12 or 15 mg/kg/d)  CrCl 30-50: Reduce dose by 50% (7.5 mg/kg q24h or 15mg/kg q48h)  CrCl 10-30: Reduce dose by 67-75%% (5 mg/kg q24h or 10mg/kg q48h)  CrCl &lt;10: 7.5 mg q 48h</p> <p>HD/CAPD: 10 mg/kg x1, then 5mg/kg after each dialysis</p> <p>Dose according to levels (Trough &lt;5 mg/L probably less nephrotoxic)</p>
Amoxicillin	<p><u>Adult</u>  250-1000 mg PO q8h  Standard dose: 875mg BID or 500mg TID  High dose: <a href="#">1000mg TID (Pneumonia, uncomplicated bacteremia)</a></p> <p><u>Pediatric</u>  <i>Standard dose:</i>  12.5-25 mg/kg PO q8-12h  (25-50 mg/kg/day)</p> <p><i>High-dose (Acute otitis media):</i>  90 mg/kg/day PO <b>divided</b> q8-12h</p>	<p><i>Same for Adult &amp; Pediatric</i>  CrCl 10-30: Same dose q12h  CrCl &lt;10: Same dose q24h</p> <p>HD: Dose daily as CrCl &lt;10; give daily, dose after HD on dialysis days  CAPD: 250 mg q12h</p>
Amoxicillin/clavulanate	<p><u>Adult</u>  500/125 mg PO q8h</p>	<p>CrCl 10-30: 250/125 mg q12h  CrCl &lt;10: 250/125 mg q24h</p>



	<p>875/125 mg PO q12h</p> <p>2000/125 mg PO q12h (XR formulation<sup>NF</sup>)</p> <p>-----</p> <p><u>Pediatric</u> (based on amoxicillin component)  <i>Standard dose:</i>  15-45 mg/kg 12h</p> <p><i>Acute otitis media:</i>  22.5-45 mg/kg q12h  (30-90 mg/kg/day)</p>	<p>CrCl 10-30: 500/125 mg q12h  CrCl &lt;10: 500/125 mg q24h</p> <p>XR formulation NOT recommended with CrCl &lt;30</p> <p>HD: Dose as daily CrCl &lt;10; give daily, dose after HD on dialysis days  CAPD: 250/62.5 mg q12h</p> <p>-----</p> <p>CrCl 10-30: Same dose q12h  CrCl &lt;10: Same dose q24h</p> <p>HD: Dose daily as CrCl &lt;10; give daily, dose after HD on dialysis days  CAPD: No clear recommendations</p>
Amphotericin B deoxycholate	<p><u>Adult &amp; Pediatric</u>  0.7-1 mg/kg IV q24h</p>	No adjustment necessary
Amphotericin B liposomal	<p><u>Adult &amp; Pediatric</u>  3 mg/kg IV q24h  Use adjusted body weight in obese patients  <i>(Automatic dose substitution to 3 mg/kg, refer to policy on ASP website<sup>§</sup>)</i>  5 mg/kg for mucormycosis</p>	No adjustment necessary
Ampicillin	<p><u>Adult</u>  1-2 g IV q4-6h (2 g preferred dose)</p> <p>-----</p> <p><u>Pediatric</u>  25-100 mg/kg IV q6h</p>	<p>CrCl 30-50: Same dose q8h  CrCl &lt;30: Same dose q12h</p> <p>HD: Dose as CrCl &lt;10; give dose every 12 hours, after HD on dialysis days  CAPD: 250 mg q12h</p> <p>-----</p> <p>CrCl &lt;10: Same dose q12h</p> <p>HD: Dose as CrCl &lt;10; give dose every 2 hours, after HD on dialysis days  CAPD: No clear recommendations</p>
Ampicillin/sulbactam	<p><u>Adult</u>  1.5-3 g IV q6h (3 g preferred dose)</p> <p>-----</p> <p><u>Pediatric</u> (based on ampicillin component)</p>	<p>CrCl 30-50: Same dose q8h  CrCl 15-29: Same dose q12h  CrCl &lt;15: Same dose q24h</p> <p>HD: Dose daily as CrCl &lt;15; give daily, dose after HD on dialysis days  CAPD: Dose as CrCl &lt;15</p> <p>-----</p>



	25-100 mg/kg IV q6h	CrCl 15-29: Same dose q12h CrCl <15: Same dose q24h  HD: Dose as daily CrCl <15; give daily, dose after HD on dialysis days CAPD: Dose as CrCl <15
Atovaquone	<u>Adult</u> 1500 mg PO daily divided q12-24h  <u>Pediatric</u> (<13 years old) 20 mg/kg PO q12h	No data
Azithromycin	<u>Adult</u> 250-500 mg PO/IV q24h  <u>Pediatric</u> 5-10 mg/kg PO/IV q24h	No adjustment necessary  Caution advised if CrCl <10 (AUC increased by 35%)
Aztreonam	<u>Adult</u> <i>Standard dose:</i> 1 g IV q8h  <i>Moderate-severe infection, Pseudomonas:</i> 2 gm IV q8hr  ----- <u>Pediatric</u> 30-60 mg/kg IV q6-8h	CrCl 10-30: Same dose IV q12h CrCl <10: Same dose IV q24h  HD: Dose as for CrCl <10; give daily, dose after HD on dialysis days CAPD: Dose as CrCl <10  ----- CrCl 10-30: 50% IV at same interval <sup>F</sup> CrCl <10: 25% IV at same interval <sup>F</sup>  HD: Dose as for CrCl <10 with an extra 3.25-7.5 mg/kg dose after HD CAPD: Dose as CrCl <10
Cefazolin	<u>Adult</u> <i>MSSA bacteremia, and patients &gt; 80 kg with moderate-severe infections including all gram-negative infections except simple UTI:</i> 2 g IV q8h  <i>Simple UTI:</i> 1 g IV q8h  ----- <u>Pediatric</u> 16.7-50mg/kg IV q8h	CrCl 10-30: Same dose q12h CrCl <10: 1-2 g q24h  HD: 1 g q24h, dose given after HD on dialysis days <b>OR</b> 2 g after each HD 3x/week. For bloodstream infection, 2g after first two HD sessions then 3g after dialysis Fri/Saturday CAPD: 500 mg IV q12h  ----- CrCl 10-30: Same dose q12h CrCl <10: Same dose q24h  HD: 2.5-7.5 mg/kg given only after HD CAPD: No adjustment necessary
Cefepime	<u>Adult</u>	



<p>Refer to dosing protocol on ASP website<sup>§</sup></p>	<p><u>Standard dose:</u> 1 g IV q6h</p> <p>-----</p> <p><u>Febrile neutropenia:</u> 2 g IV q8h</p> <p>-----</p> <p><u>Pediatric</u> ≥ 40 kg: Refer to adult dosing</p> <p>&lt;40 kg: 50 mg/kg IV q8-12h</p>	<p>CrCl 30-50: 1 g IV q8h CrCl 10-29: 1 g IV q12h CrCl &lt; 10: 1 g IV q24h HD: Dose as CrCl &lt;10; give 1g daily, dose after HD on dialysis days. Limited data with 2g 3x/week. Ceftazidime preferred for safety. CAPD: 50 mg/kg IV q48h</p> <p>-----</p> <p>CrCl 30-50: 2 g IV q12h CrCl 10-29: 1 g IV q12h CrCl &lt; 10: 1 g IV q24h</p> <p>HD: Dose as CrCl &lt;10; give 1g daily, dose after HD on dialysis days. Limited data with 2g 3x/week. Ceftazidime preferred for safety. CAPD: 50 mg/kg IV q48h</p> <p>-----</p> <p>CrCl 10-50: Same dose q12 (for q8h dosing)-q24h (for q12h dosing) CrCl &lt;10: 50% q24h<sup>†</sup></p> <p>HD: Dose as CrCl &lt;10; give daily, dose after HD on dialysis days. CAPD: 50 mg/kg IV q48h</p>
<p>Cefotaxime</p>	<p><u>Adult</u> 1-2 g IV q8h</p> <p><i>(Restricted to pediatric patients. Therapeutic interchange to ceftriaxone in adults, see cephalosporin therapeutic interchange policy)</i></p> <p>-----</p> <p><u>Pediatric</u> 25-100 mg/kg IV q6-8h (100-200 mg/kg/day)</p>	<p>CrCl 10-50: Same dose q12h CrCl &lt;10: Same dose q24h</p> <p>HD: Dose daily as CrCl &lt;10; give dose after HD on dialysis days CAPD: 1 g IV q24h</p> <p>-----</p> <p>CrCl &lt;20: same dose q24h</p> <p>HD: Dose daily as CrCl &lt;20; give daily, dose after HD on dialysis days CAPD: 50-100 mg/kg IV q24h</p>
<p>Cefoxitin</p>	<p><u>Adult</u> <u>Standard dose:</u> 1-2 g IV q6-8h</p> <p>For coverage of <i>Enterobacteriaceae</i> (<i>E. coli</i>, <i>Klebsiella spp.</i>, <i>Proteus spp.</i>, etc.): 2 g IV q6h</p> <p>-----</p> <p><u>Pediatric</u> 20-40 mg/kg IV q6h</p>	<p>CrCl 10-30: Same dose q12h CrCl &lt;10: Same dose q24h</p> <p>HD: Dose as CrCl &lt;10; give daily, dose after HD on dialysis days CAPD: 1 g IV q24h</p> <p>-----</p> <p>CrCl 51-90: Same dose q8h CrCl 10-50: Same dose q12h</p>



		CrCl <10: Same dose q24-48h  HD: Dose as CrCl <10; give daily, dose after HD on dialysis days CAPD: No clear recommendations
Ceftaroline <sup>NF</sup>	<u>Adult</u> Standard dose: 600 mg IV q12h  <i>Salvage therapy/severe infections:</i> 600 mg IV q8h  ----- <u>Pediatric</u> Safety and efficacy not established	CrCl 31-50: 400 mg q12h CrCl 15-30: 300 mg q12h ESRD, HD: 200 mg q12h; give dose after HD on dialysis days  CrCl 31-50: 400 mg q8h CrCl 15-30: 400 mg q12h ESRD, HD: 300 mg q12h; give dose after HD on dialysis days
Ceftazidime	<u>Adult</u> Standard dose: 1 g IV q8h  <i>Pseudomonas:</i> 2 g IV q8h  ----- <u>Pediatric</u> 30-50 mg/kg IV q8h	CrCl 10-30: Same dose q12h CrCl <10: 1 g q24h  HD: Dose daily as CrCl <10; give daily, dose after HD on dialysis days. Extensive experience with 2g 3x/week in outpatients. CAPD: 1 g x 1 dose, then 500 mg q24h  ----- CrCl 30-50: Same dose q12h CrCl 10-29: Same dose q24h CrCl <10: Same dose q48h  HD: Dose as CrCl <10; give daily, dose after HD on dialysis days CAPD: 30-75 mg/kg IV x1, then 50% q24h <sup>F</sup>
Ceftazidime/avibactam <sup>NF</sup>	<u>Adult</u> 2.5 g IV q8h  ----- <u>Pediatric</u> Safety and efficacy not established	CrCl 31-50: 1.25 g q8h CrCl 16-30: 0.94 g q12h CrCl 6-15: 0.94 g q24h CrCl ≤ 5: 0.94 g q48h ESRD on HD: 0.94g q24h (limited data)
Ceftolozane/tazobactam <sup>R</sup> <i>Restricted to ID service</i>	<u>Adult</u> 1.5 g IV q8h (May use 3 g IV q8h for VAP)	CrCl 30-50: 750 mg q8h CrCl 15-29: 375 mg q8h





	<p>-----</p> <p><u>Pediatric</u> Safety and efficacy not established</p>	<p>ESRD on HD: 500 mg x 1 dose, then 150 mg q8h</p>
Ceftriaxone	<p><u>Adult</u> Standard dose: 1 g IV q24h</p> <p><i>Patients &gt;80 kg, or endocarditis (Streptococcal or Gram negative):</i> 2 g IV q24h</p> <p><i>Meningitis or <a href="#">Enterococcal endocarditis</a> (combo with ampicillin):</i> 2 g IV q12h</p> <p>-----</p> <p><u>Pediatric</u> 25-100 mg/kg IV q12-24h (50-100 mg/kg/day)</p>	<p>No adjustment necessary</p> <p>CAPD: 1 g q12h</p> <p>-----</p> <p>No adjustment necessary</p>
Cefuroxime	<p><u>Adult</u> PO 250-500 mg PO q12h</p> <p>IV 1.5 g IV q8h</p> <p>-----</p> <p><u>Pediatric</u> PO 10-15 mg/kg PO q12h</p> <p>IV 25-50 mg/kg IV q8h</p>	<p>No adjustment necessary</p> <p>CrCl 10-20: 1.5 g q12h CrCl &lt;10: 1.5 g q24h</p> <p>HD: Dose daily as CrCl &lt;10; give daily, dose after HD on dialysis days CAPD: Dose as CrCl &lt;10</p> <p>-----</p> <p>No adjustment necessary</p> <p>HD: 15mg/kg daily, give after HD on dialysis days</p> <p>CrCl 10-20: Same dose q12h CrCl &lt;10: Same dose q24h</p> <p>HD: Dose as CrCl &lt;10; give daily, dose after HD on dialysis days CAPD: Dose as CrCl &lt;10</p>
Cephalexin	<p><u>Adult</u> 250-1000 mg PO q6h</p>	<p>CrCl 50-90: Same dose q8h CrCl &lt;50: Same dose q12h</p>



	<p>-----</p> <p><u>Pediatric</u> 6.25-37.5 mg/kg PO q6h</p>	<p>HD: Dose as CrCl &lt;50; give q12h, dose after HD on dialysis days CAPD: Dose as CrCl &lt;50</p> <p>-----</p> <p>CrCl 10-40: Same dose q8h CrCl &lt;10: Same dose q12h</p> <p>HD: Dose as CrCl &lt;10; give 12h, dose after HD on dialysis days CAPD: Dose as CrCl &lt;10</p>
Chloramphenicol	<p><u>Adult</u> 12.5-25 mg/kg IV q6h</p> <p><u>Pediatric</u> 6.25-25 mg/kg IV q6h</p>	No adjustment necessary
Ciprofloxacin <sup>NF</sup>	<p><u>Adult</u> <u>PO</u> 250-750 mg PO q12h (750 mg q8h for pneumonia/severe infection or <i>Pseudomonas</i>)</p> <p><u>IV</u> 400 mg IV q8-12h (400 mg q8h for pneumonia/severe infection or <i>Pseudomonas</i>)</p> <p>-----</p> <p><u>Pediatric</u> <u>PO</u> 10-20 mg/kg PO q12h</p> <p><u>IV</u> 10-15 mg/kg IV q8-12h</p>	<p>CrCl &lt;30: same dose q24h</p> <p>HD/CAPD: Dose as CrCl &lt;30; give daily, dose after HD on dialysis days</p> <p>CrCl &lt;30: Same dose q12 (for q8h regimen) or 24h (for q12h regimen)</p> <p>HD/CAPD: Dose as CrCl &lt;30; give daily, dose after HD on dialysis days</p> <p>-----</p> <p>No clear recommendations</p>
Clarithromycin	<p><u>Adult</u> 0.5-1 g PO q12h</p> <p><u>Pediatric</u> 7.5 mg/kg PO q12h</p>	<p><i>Same for Adult &amp; Pediatric</i> CrCl &lt;30: 50% PO q12h<sup>†</sup></p> <p>HD: Dose as CrCl &lt;30; give q12h, dose after HD on dialysis days CAPD: No adjustment necessary</p>
Clindamycin	<p><u>Adult</u> <u>PO</u> 150-450 mg PO q6-8h 600 mg PO q8h (<a href="#">MRSA</a>)</p> <p><u>IV</u> Standard dose: 600 mg IV q8h Necrotizing fasciitis: 900 mg IV q8h</p>	No adjustment necessary



	<p><u>Pediatric</u>  <b>PO</b>  2.5-10 mg/kg PO q6-8h  (10-30 mg/kg/day)</p> <p><b>IV</b>  6.25-10 mg/kg IV q6-8h  (25-40 mg/kg/day)</p>																							
<p>Colistimethate (Colistin methanesulfonate), IV<sup>R</sup></p> <p><i>Recommended for urinary tract infections and inhaled therapy (see below for dosing). Polymyxin B preferred in other situations.</i></p> <p><i>Restricted to ID service and pulmonary service</i></p> <p>Doses expressed as colistin base activity. For more information see <a href="#">International Consensus Guidelines on Optimal Use of Polymyxins</a></p>	<p><u>Adult</u>  Use loading dose of 300mg IV in all patients; start maintenance dose 12h after loading dose</p> <p>CrCl, mL/minute</p> <table> <tr> <td>≥90</td> <td>180mg q12h</td> </tr> <tr> <td>80 to &lt;90</td> <td>170mg q12h</td> </tr> <tr> <td>70 to &lt;80</td> <td>150mg q12h</td> </tr> </table> <p><u>Pediatrics</u>  5 mg/kg/day colistin base IV in 2-4 divided doses</p> <p><a href="#">(See colistin dosing guidance on ASP website)</a></p>	≥90	180mg q12h	80 to <90	170mg q12h	70 to <80	150mg q12h	<p>Use loading dose of 300 mg IV in all patients; start maintenance dose 24 hours after loading dose in patients with diminished renal function</p> <p>Daily dose divided q12h (Doses &lt;200mg may be given q24h)</p> <p>CrCl, mL/minute</p> <table> <tr> <td>60 to &lt;70</td> <td>275 mg/d</td> </tr> <tr> <td>50 to &lt;60</td> <td>245 mg/d</td> </tr> <tr> <td>40 to &lt;50</td> <td>220 mg/d</td> </tr> <tr> <td>30 to &lt;40</td> <td>195 mg/d</td> </tr> <tr> <td>20 to &lt;30</td> <td>175 mg/d</td> </tr> <tr> <td>10 to &lt;20</td> <td>160 mg/d</td> </tr> <tr> <td>5 to &lt;10</td> <td>145 mg/d</td> </tr> <tr> <td>0</td> <td>130 mg/d</td> </tr> </table> <p>HD: 130mg/d + 50 mg on dialysis days after typical 4-hr HD (40mg if 3-hr HD session)  CRRT: 220mg q12h  Slow-low efficiency dialysis (SLED): Usual dose per CrCL (typically 130mg/d) + 10%/hr.  E.g. 10 hr nocturnal dialysis requires 130mg supplemental dose</p>	60 to <70	275 mg/d	50 to <60	245 mg/d	40 to <50	220 mg/d	30 to <40	195 mg/d	20 to <30	175 mg/d	10 to <20	160 mg/d	5 to <10	145 mg/d	0	130 mg/d
≥90	180mg q12h																							
80 to <90	170mg q12h																							
70 to <80	150mg q12h																							
60 to <70	275 mg/d																							
50 to <60	245 mg/d																							
40 to <50	220 mg/d																							
30 to <40	195 mg/d																							
20 to <30	175 mg/d																							
10 to <20	160 mg/d																							
5 to <10	145 mg/d																							
0	130 mg/d																							
<p>Colistin base, inhaled<sup>R</sup></p> <p><i>Restricted to ID service and pulmonary service</i></p>	<p><u>Adult</u>  75-150 mg inhaled q12h  (Standard dose for tracheobronchitis and cystic fibrosis)</p> <p>150 mg inhaled q8h  (High-dose for MDR pneumonia)</p> <p><u>Pediatric</u>  30-75 mg inhaled q12h</p>	<p>No adjustment necessary</p>																						
<p>Dalbavancin<sup>R</sup></p> <p><i>Restricted to ID service for outpatient infusion only</i></p>	<p><u>Adult</u>  <i>Single dose regimen:</i>  1500 mg IV once  May be repeated once in 1-2 weeks for orthopedic infections (outpatient only)</p> <p><i>Two-dose regimen:</i></p>	<p>CrCl &lt; 30, not on regular HD: 1125 mg</p>																						



	<p>1000 mg IV once followed by 500 mg IV once in one week (soft tissue infections)</p> <p>-----</p> <p><u>Pediatric</u> Safety and efficacy not established</p>	<p>CrCl &lt;30, not on regular HD: 750 mg once followed by 375 mg in one week</p> <p>ESRD on HD: No adjustment necessary</p>
Dapsone	<p><u>Adult</u> 50-100 mg PO q24h</p> <p><u>Pediatric</u> 1-2 mg/kg PO q24h</p>	No clear guidelines, but adjustment recommended
Daptomycin <sup>R</sup>  <i>Restricted to ID service when used for non FDA-approved indications</i>	<p><u>Adult</u> <i>MRSA bacteremia, severe infections:</i> 6 mg/kg IV q24h</p> <p><i>UTI or skin/skin structure infection:</i> 4 mg/kg IV q24h</p> <p><u><i>Refractory MRSA infections, or VRE bacteremia:</i></u> 8-10 mg/kg q24h</p> <p>-----</p> <p><u>Pediatric</u> Safety and efficacy not established</p>	<p>CrCl &lt;30: Same dose q48h</p> <p>HD: Dose as CrCl &lt;30; give dose after HD on dialysis days <b>OR</b> dose after each HD session 3x/week (6 mg/kg, 6 mg/kg, and 9 mg/kg after Fri/Sat session)</p> <p>CAPD: Dose as CrCl &lt;30</p>
Delafloxacin <sup>NF</sup>	<p><u>Adult</u> Oral: 450 mg q12h IV: 300 mg q12h</p>	<p>CrCl 15-30: Oral: No adjustment necessary IV: 200 mg q12h CrCl &lt; 15: Use not recommended ESRD on HD: Not recommended</p>
Dicloxacillin	<p><u>Adult</u> 250-500 mg PO q6h</p> <p><u>Pediatric</u> 6.25-12.5 mg/kg PO q6h</p>	No adjustment necessary
Doxycycline	<p><u>Adult</u> 100 mg PO/IV q12h</p> <p><u>Pediatric</u> (not to be used in children &lt;8 years) 1-4 mg/kg PO/IV q12-24h (2-4 mg/kg/day)</p>	No adjustment necessary
Ertapenem	<p><u>Adult</u> 1 g IV q24h</p> <p>-----</p> <p><u>Pediatric</u> 15 mg/kg IV q12h</p> <p>-----</p>	<p>CrCl &lt; 30: 500 mg IV q24h</p> <p>HD/CAPD: Dose as CrCl &lt;30; give daily, dose after dialysis on dialysis days. Limited experience with 1g 3x/week</p> <p>-----</p> <p>No clear recommendations</p>
Erythromycin	<p><u>Adult</u> PO</p>	<i>Same for Adult &amp; Pediatric</i>



	<p>250-500 mg PO q6-12h</p> <p><i>IV</i> 15-20 mg/kg/day IV divided q6-8h</p> <p><u>Pediatric</u> <i>PO</i> 7.5-16.7 mg/kg PO q6-8h (30-50 mg/kg/day)</p> <p><i>IV</i> 3.75-12.5 mg/kg IV q6h</p>	<p>CrCl &lt;10: 50% PO/IV at same interval<sup>†</sup></p> <p>HD/CAPD: Dose as CrCl &lt;10</p>
Ethambutol	<p><u>Adult</u> 15-20 mg/kg PO q24h (round to nearest 400mg, max dose 2.4 g) 40 to 55 kg: 800 mg (14.5 to 20 mg/kg) 56 to 75 kg: 1,200 mg (16 to 21.4 mg/kg) 76 to 90 kg: 1,600 mg (17.8 to 21.1 mg/kg)</p> <p>Based on estimated lean body weight. Optimal doses for obese patients are not established.</p> <p>30 mg/kg PO three times weekly is alternative for continuation phase</p> <p><u>Pediatric</u> 15-25 mg/kg PO q24h (max dose 2.4 g)</p>	<p><i>Same for Adult &amp; Pediatric</i> CrCl &lt;30: 20-25 mg/kg three times weekly</p> <p>HD: Same as &lt;30. Give dose only after dialysis</p> <p>CAPD: Dose as CrCl &lt;30</p>
Fidaxomicin <sup>NF</sup>	<p><u>Adult</u> 200 mg PO q12h</p> <p>-----</p> <p><u>Pediatric</u> Safety and efficacy not established</p>	<p>No adjustment necessary</p>
Famciclovir	<p><u>Adult</u> 500 mg PO q8h (varicella zoster)</p> <p>-----</p> <p><u>Pediatric</u> Safety and efficacy not established</p>	<p>CrCl 40-59: same dose q12h CrCl 20-39: same dose q24h CrCl &lt;20: 50% q24h<sup>†</sup></p> <p>HD: 50% after each dialysis session<sup>†</sup> CAPD: No clear recommendations</p>
Fluconazole	<p><u>Adult</u> <i>Invasive candidiasis (susceptible C. albicans, C. tropicalis, C. parapsilosis or susceptible dose-dependent C. glabrata with MIC ≤ 4)):</i> 800 mg (12 mg/kg) load x 1 dose then 400 mg (6 mg/kg) PO/IV q24h</p> <p><i>CNS infections or Candida glabrata with MIC = 8-16 mg/mL:</i></p>	<p><i>Invasive candidiasis:</i> CrCl &lt;30: 800 mg (12 mg/kg) load then 50% dose (200mg = 3 mg/kg) q24h<sup>†</sup></p> <p>HD: 800 mg (12 mg/kg) load then 400 mg (6 mg/kg) after HD 3x/week CAPD: 800 mg (12 mg/kg) load then 50% dose (3 mg/kg) q24h<sup>†</sup></p>



	<p>12 mg/kg (<a href="#">800 mg</a>) q24h</p> <p><i>Esophageal candidiasis:</i> 200 mg PO/IV q24h</p> <p><i>Oropharyngeal candidiasis:</i> 100 mg PO/IV q24h</p> <p>-----</p> <p><u>Pediatric</u> 3-12 mg/kg/day PO/IV q24h</p>	<p><i>Esophageal &amp; oropharyngeal candidiasis:</i> CrCl &lt;30: 50% dose q24h<sup>†</sup></p> <p>HD: 100% dose after each dialysis<sup>†</sup> CAPD: 50% dose q24h<sup>†</sup></p> <p>-----</p> <p>CrCl 20-50: 50% dose q24h<sup>†</sup> CrCl &lt;20: 25% dose q24h<sup>†</sup> HD: Give dose only after dialysis CAPD: 25% dose q24h<sup>†</sup></p>
Flucytosine	<p><u>Adult</u> 50-150 mg/kg/day PO divided q6h Use ideal body weight</p> <p>-----</p> <p><u>Pediatric</u> 25-37.5 mg/kg PO q6h</p>	<p>CrCl 10-50: Same dose q12-24h CrCl &lt;10: Same dose q24h HD/CAPD: Give dose only after dialysis</p> <p>-----</p> <p>CrCl 20-40: Same dose q12 CrCl 10-19: Same dose q24h CrCl &lt;10: Same dose q48h HD/CAPD: Give dose only after dialysis</p>
Foscarnet	<p><u>Adult</u> <i>Mucocutaneous HSV:</i> 40 mg/kg IV q8h</p> <p><i>Disseminated CMV, induction:</i> 60 mg/kg IV q8h</p> <p><i>Disseminated CMV, maintenance:</i> 90-120 mg/kg IV q24h</p> <p>-----</p> <p><u>Pediatric</u> <i>Induction:</i></p>	<p><b>CrCl as ml/min/kg body weight</b> CrCl &gt;1.0-1.4: 30 mg/kg q8h CrCl &gt;0.8-1.0: 35 mg/kg q12h CrCl &gt;0.6-0.8: 25 mg/kg q12h CrCl &gt;0.5-0.6: 40 mg/kg q24h CrCl 0.4-0.5: 35 mg/kg q24h CrCl &lt;0.4: Use not recommended</p> <p>CrCl &gt;1.0-1.4: 45 mg/kg q8h CrCl &gt;0.8-1.0: 50 mg/kg q12h CrCl &gt;0.6-0.8: 40 mg/kg q12h CrCl &gt;0.5-0.6: 60 mg/kg q24h CrCl 0.4-0.5: 50 mg/kg q24h CrCl &lt;0.4: Use not recommended</p> <p>CrCl &gt;1.0-1.4: 70-90 mg/kg IV q24h CrCl &gt;0.8-1.0: 50-65 mg/kg IV q24h CrCl &gt;0.6-0.8: 80-105 mg/kg IV q48h CrCl &gt;0.5-0.6: 60-80 mg/kg IV q48h CrCl 0.4-0.5: 50-65 mg/kg IV q48h CrCl &lt;0.4: Not recommended.</p> <p>HD: 40-60 mg/kg after each HD session</p> <p>-----</p> <p><b>CrCl as ml/min/kg body weight</b></p>



	<p>60 mg/kg IV q8h</p> <p><i>Maintenance:</i> 90-120 mg/kg IV q24h</p> <p>40-60 mg/kg IV q12h</p>	<p>CrCl <math>\geq</math> 1.6: 60 mg/kg q8h  CrCl 1.5: 56.5 mg/kg q8h  CrCl 1.4: 53 mg/kg q8h  CrCl 1.3: 49.4 mg/kg q8h  CrCl 1.2: 45.9 mg/kg q8h  CrCl 1.1: 42.4 mg/kg q8h  CrCl 1.0: 38.9 mg/kg q8h  CrCl 0.9: 35.3 mg/kg q8h  CrCl 0.8: 31.8 mg/kg q8h  CrCl 0.7: 28.3 mg/kg q8h  CrCl 0.6: 24.8 mg/kg q8h  CrCl 0.5: 21.2 mg/kg q8h  CrCl 0.4: 17.7 mg/kg q8h  CrCl &lt;0.4: Use not recommended</p> <p>CrCl 1-1.4: 70-90 mg/kg q24h  CrCl 0.8-&lt;1: 50-65 mg/kg q24h  CrCl 0.6-&lt;0.8: 80-105 mg/kg q48h  CrCl 0.5-&lt;0.6: 60-80 mg/kg q48h  CrCl 0.4-&lt;0.5: 50-65 mg/kg q48h  CrCl &lt;0.4: Use not recommended</p> <p>HD/CAPD: No data</p>
<p>Fosfomycin<sup>R</sup></p> <p><i>Restricted to ID service (exception: single dose for uncomplicated cystitis)</i></p>	<p><u>Adult</u> (<math>\geq</math> 15 years)  <i>Uncomplicated cystitis:</i> 3 g PO x 1 dose  <i>Complicated cystitis:</i> 3 g PO q48h</p> <p>-----</p> <p><u>Pediatric</u>  <math>\leq</math>14 years:  <i>Uncomplicated cystitis:</i> 2 g PO x 1 dose  <i>Complicated cystitis:</i> 2 g PO q48h</p> <p><math>\leq</math>1 year:  <i>Uncomplicated cystitis:</i> 1 g PO x 1 dose  <i>Complicated cystitis:</i> 1 g PO q48h</p>	<p>CrCl &lt;50: Same dose</p> <p>CrCl &lt;50: 3 g q72h</p> <p>-----</p> <p><i>If uncomplicated and CrCl &lt;50:  Give same dose (no adjustment)</i></p> <p><i>If complicated and CrCl &lt;50:  Age <math>\leq</math>14 years: 2 g q72h  Age <math>\leq</math>1 year: 1 g q72h</i></p>
<p>Ganciclovir</p>	<p><u>Adult</u>  <i>PO (rarely indicated, use valgancyclovir)</i>  1 g PO q8h</p> <p><i>IV</i>  <i>Induction:</i>  5 mg/kg IV q12h</p> <p><i>Maintenance:</i></p>	<p>CrCl 50-69: 1.5 g q24h or 500 mg q8h  CrCl 25-49: 1 g q24h  CrCl 10-24: 500 mg q24h  CrCl &lt;10: 500 mg 3x/week</p> <p>CrCl 50-69: 2.5 mg/kg q12h  CrCl 25-49: 2.5 mg/kg q24h  CrCl 10-24: 1.25 mg/kg q24h  CrCl &lt;10: 1.25 mg/kg 3x/week</p>



	<p>5 mg/kg IV q24h</p> <p>-----</p> <p><u>Pediatric</u>  <i>PO</i>  30 mg/kg PO q8h</p> <p><i>IV</i>  <i>Induction:</i>  5 mg/kg IV q12h</p> <p><i>Maintenance:</i>  5 mg/kg IV q24h</p>	<p>CrCl 50-69: 2.5 mg/kg q24h  CrCl 25-49: 1.25 mg/kg q24h  CrCl 10-24: 0.625 mg/kg q24h  CrCl &lt;10: 0.625 mg/kg 3x/week</p> <p>HD (PO/IV): Dose as CrCl &lt;10 given after HD sessions</p> <p>-----</p> <p>No clear recommendations</p> <p>CrCl 50-69: 2.5 mg/kg q12h  CrCl 25-49: 2.5 mg/kg q24h  CrCl 10-24: 1.25 mg/kg q24h  CrCl &lt;10: 1.25 mg/kg 3x/week</p> <p>CrCl 50-69: 2.5 mg/kg q24h  CrCl 25-49: 1.25 mg/kg q24h  CrCl 10-24: 0.625 mg/kg q24h  CrCl &lt;10: 0.625 mg/kg 3x/week</p> <p>HD (PO/IV): Dose as CrCl &lt;10; give dose only after HD sessions</p>
<p>Gentamicin</p> <p><i>Refer to PK training packet on ASP website<sup>§</sup></i></p>	<p><u>Adult</u>  <i>Extended interval dosing:</i>  7 mg/kg once daily</p> <p>5 mg/kg/day may be used for UTIs</p> <p>(Refer to PK training packet on ASP website<sup>§</sup> for exclusions to extended-interval dosing)</p> <p>-----</p> <p><i>Traditional dosing:</i>  1.5-2.5 mg/kg IV q8h</p> <p>Monitoring of serum levels is recommended</p> <p>-----</p> <p><u>Pediatric</u>  <i>Traditional dosing:</i>  1.5-2.5 mg/kg IV q8h</p>	<p><i>Extended interval dosing:</i>  Frequency adjusted by serum level 6-14 hours after start of infusion using Hartford nomogram</p> <p>-----</p> <p><i>Traditional dosing (empiric):</i>  CrCl 51-90: 60-90% q8-12h<sup>†</sup>  CrCl 10-50: 30-70% q12h<sup>†</sup>  CrCl &lt;10: 20-30% q24-48h<sup>†</sup>  HD/CAPD: Dose according to levels</p>
<p>Imipenem/cilastatin<sup>NF</sup></p>	<p><u>Adult</u>  500 mg IV q6h</p> <p>-----</p> <p><u>Pediatric</u>  15-25 mg/kg IV q6h</p>	<p><b>Refer to Appendix A for renal dose adjustments in adults</b></p> <p>-----</p> <p>CrCl 41-70: 50% IV q6h<sup>†</sup>  CrCl 21-40: 35% IV q8h<sup>†</sup>  CrCl 6-20: 25% IV q12h<sup>†</sup></p>





		HD: Same dose q12h; give dose after dialysis on dialysis days CAPD: Dose as CrCl 6-20
Isavuconazonium sulfate <i>Restricted to ID services</i>	<u>Adult</u> 372 mg IV/PO q8h x 6 doses followed by 372 mg IV/PO q24h (start 12-24 hours after last loading dose)  (372 mg isavuconazonium sulfate = 200 mg isavuconazole) ----- <u>Pediatric</u> Safety and efficacy not established	No adjustment necessary
Isoniazid	<u>Adult</u> 5 mg/kg PO q24h  <u>Pediatric</u> 10-15 mg/kg PO q24h	No adjustment necessary  HD/CAPD: Give daily, dose after HD on dialysis days
Itraconazole	<u>Adult</u> 100-200 mg PO q12h  <i>Endemic fungi (Histoplasma sp. Coccidioides sp. Blastomyces sp.):</i> 200 mg PO q8h load x 2 days then 200 mg PO q12h  <u>Pediatric</u> 3-5 mg/kg PO q24h	No renal adjustment necessary  Therapeutic drug monitoring is suggested; target trough at steady-state (7 days) is >1 mg/L (sum of hydroxy-itraconazole and itraconazole)
Levofloxacin	<u>Adult</u> 750 mg PO/IV q24h  500 mg PO/IV q24h  <i>Urinary tract infection, cystitis:</i> 250 mg PO/IV q24h ----- <u>Pediatric</u> < 6 mo: Use not recommended ≥ 6 mo to <5 yrs: 10 mg/kg PO/IV q12h ≥ 5 yrs: 10 mg/kg PO/IV q24h (max 750 mg/day)	CrCl 20-49: 750 mg q48h CrCl <20 or HD/PD: 750 mg x 1 dose, then 500 mg q48h  CrCl 20-49: 500 mg x 1 dose, then 250 mg q24h CrCl <20, HD/PD: 500 mg x 1 dose, then 250 mg q48h  CrCl ≤20: 250 mg q48h (if ordered for ≤3 days, then no adjustment needed) ----- <i>All Ages:</i> CrCl 10-29: 10mg/kg q24h CrCl <10, HD/PD: 10 mg/kg q48h
Linezolid	<u>Adult</u> 600 mg PO/IV q12h  <u>Pediatric</u>	No adjustment necessary



	10 mg/kg PO/IV q8-12h	
Meropenem  <i>Refer to dosing protocol on ASP website<sup>§</sup></i>	<p><u>Adult</u> Standard dose: 500 mg IV q6h</p> <p><i>Simple urinary tract infection:</i> 500 mg IV q8h</p> <p><i>Meningitis, cystic fibrosis, or MIC of 4 mcg/mL:</i> 2 g IV q8h</p> <p>3-hour infusion can be considered for organisms with MIC up to 8 mcg/mL</p> <p>-----</p> <p><u>Pediatric</u> 20-40 mg/kg IV q8h (Use q12h for neonates ≤7 days old)</p>	<p>CrCl 25-49: 500 mg q8h CrCl 10-24: 500 mg q12h CrCl &lt;10: 500 mg q24h</p> <p>CrCl 25-49: 500 mg q12h CrCl 10-24: 250 mg q12h CrCl &lt;10: 500 mg q24h</p> <p>CrCl 25-49: 2 g q12h CrCl 10-24: 1 g q12h CrCl &lt;10: 1 g q24h</p> <p>HD/CAPD: Dose as CrCl &lt; 10; Give daily (after HD on dialysis days)</p> <p>-----</p> <p>No clear recommendations for neonates ≤7 days old. For neonates &gt;7 days old: CrCl 10-24: Same dose q12h CrCl &lt; 10: Same dose q24h</p> <p>HD/CAPD: Dose as CrCl &lt;10; give daily, after dialysis on dialysis days</p>
Metronidazole	<p><u>Adult</u> 500 mg PO/IV q8h</p> <p><u>Pediatric</u> 3.75-16.7 mg/kg PO/IV q6-8h (15-50 mg/kg/day)</p>	<p><i>Same for Adult &amp; Pediatric</i> CrCl &lt;10, HD, or severe hepatic dysfunction: consider 50% at same interval if &gt;14 day duration<sup>†</sup></p>
Micafungin	<p><u>Adult</u> 50-150 mg IV q24h</p> <p>-----</p> <p><u>Pediatric</u> 1-4.5 mg/kg IV q24h</p>	<p>No adjustment necessary</p> <p>-----</p> <p>No clear recommendations</p>
Minocycline IV <sup>NF</sup>	<p><u>Adult</u> 200 mg IV x 1 dose then 100 mg IV q12h</p> <p><u>Pediatric</u> (do not use in children &lt;8 years) 4 mg/kg IV x 1 dose then 2 mg/kg IV q12h</p>	No adjustment necessary
Minocycline PO	<p><u>Adult</u> 100 mg PO q12h or 200 mg PO qhs</p> <p><u>Pediatric</u> (do not use in children &lt;8 years) 2 mg/kg PO q12h or 4 mg/kg PO qhs</p>	No adjustment necessary



Moxifloxacin <sup>NF</sup>	<u>Adult</u> 400 mg PO/IV q24h  <u>Pediatric</u> Safety and efficacy not established	No adjustment necessary
Nitrofurantoin	<u>Adult</u> 50-100 mg PO q12h  <u>Pediatric</u> 1.25-1.75 mg/kg PO q6h	<a href="#">CrCl &lt;30</a> , HD/CAPD: Use not recommended (will not reliably reach useful concentrations in urine and may increase risk of toxicity)
Oritavancin <sup>NF</sup>	<u>Adult</u> 1200 mg IV once  <u>Pediatric</u> Safety and efficacy not established	CrCl <30, HD: No data available
Oseltamivir	<u>Adult ≥13 years</u> <i>Treatment:</i> 75 mg PO q12h x 5 days   <i>Prophylaxis:</i> 75 mg PO q24h x 10 days  ----- <u>Pediatric 2 weeks to 12 years</u> <i>Treatment:</i> 30-75 mg (3 mg/kg) PO q12h x 5 days  <i>Prophylaxis:</i> 30-75 mg (3 mg/kg) PO q24h x 10 days	CrCl 31-60: 30 mg q12h CrCl 11-30: 30 mg q24h ESRD on HD: 30 mg after each HD session, duration not to exceed 5 d CrCl <10, ESRD on CAPD: Single 30 mg dose given immediately after dialysis exchange  CrCl 31-60: 30 mg q24h CrCl 11-30: 30 mg every other day ESRD on HD: 30 mg after alternate HD sessions CrCl <10, ESRD on CAPD: 30 mg once weekly dose immediately after dialysis exchange  ----- No data available
Oxacillin	<u>Adult</u>  <i>MSSA bloodstream infection:</i> 2 g IV q4h  <i>Non-bloodstream infections:</i> 1-2 g IV q4-6h	No adjustment necessary



	<u>Pediatric</u> 16.7-50 mg/kg IV q4-6h (50-100 mg/kg/day)	
Penicillin G	<u>Adult</u> 2-4 million units IV q4h  ----- <u>Pediatric</u> 25,000-100,000 units/kg IV q4-6h (100,000-400,000 units/kg/day)	CrCl 10-50: 75% dose, same interval <sup>F</sup> CrCl <10: 2-4 million units q8h  HD: Dose as CrCl <10; give dose q8h, dose after HD on dialysis days CAPD: Dose as CrCl <10 ----- CrCl 10-30: Same dose q8h CrCl <10: Same dose q12h  HD: Dose as CrCl <10; give dose q12h, after HD on dialysis days CAPD: Dose as CrCl <10
Penicillin VK	<u>Adult</u> 250-500 mg PO q6-8h  <u>Pediatric</u> 6.25-16.7 mg/kg PO q6-8h (25-50 mg/kg/day)	No adjustment necessary  HD: Give dose after dialysis on dialysis days
Pentamidine	<u>Adult</u> 4 mg/kg IV q24h  ----- <u>Pediatric</u> 4 mg/kg IV q24h	No adjustment necessary ----- CrCl 10-30: Same dose q36h CrCl <10: Same dose q48h
Peramivir <sup>R</sup> <i>Restricted to ID service</i>	<u>Adult</u> 600 mg IV x 1 dose   <i>Hospitalized patients with severe influenza:</i> 600 mg IV q24h x 5 days  ----- <u>Pediatric</u> Safety and efficacy not established	CrCl 30-49: 200 mg x 1 dose CrCl 10-29: 100 mg x 1 dose ESRD on HD: 100 mg x 1 dose administered after a dialysis session  CrCl 30-49: 200 mg q24h CrCl 10-29: 100 mg q24h
Piperacillin/tazobactam <i>Refer to dosing protocol on ASP website<sup>S</sup></i>	<u>Adult &amp; Pediatric (&gt;40 kg)</u> <i>Extended 4 hour infusion (standard at NM):</i> 4.5 g IV q8h, infused over 4 hours ----- <i>Traditional, 30 minute infusion:</i> 3.375 g IV q6h or 4.5 g IV q8h	CrCl <20, HD/CAPD: 4.5 g IV q12h, dose after dialysis on dialysis days ----- CrCl 20-40: 2.25 g IV q6h



	<p>Anti-pseudomonal dosing: 4.5 g IV q6h</p> <p>-----  <u>Pediatric</u> (based on piperacillin component)  <i>Extended 4 hour infusion (&gt;2 kg and ≤40 kg):</i>  0-7 days: 100 mg/kg IV q12h  8-28 days: 100 mg/kg IV q8h  &gt;28 days: 100 mg/kg IV q6h</p> <p>NOTE: All doses must be infused over 4 hours, except for NICU patients</p> <p><i>Traditional, 30 minute infusion:</i>  50-133.3 mg/kg IV q6-8h  (150-400 mg/kg/day)</p>	<p>CrCl &lt;20: 2.25 g IV q8h</p> <p>CrCl 20-40: 3.375 g IV q6h  CrCl &lt;20: 2.25 g IV q6h</p> <p>HD: Dose as CrCl &lt;20 and give an additional 0.75 g after dialysis  CAPD: Dose as CrCl &lt;20</p> <p>-----</p> <p>CrCl 20-40: 70%, same interval<sup>†</sup>  CrCl &lt;20, HD/CAPD: 70%, infused q12h over 4h<sup>†</sup></p> <p>CrCl 20-40: 70% dose IV q6h<sup>†</sup>  CrCl &lt;20: 70% dose IV q8h<sup>†</sup></p> <p>HD/CAPD: No recommendations</p>
<p>Polymyxin B</p> <p><i>Restricted to ID service and pulmonary service</i></p> <p>Do not use for urinary tract infection. Use Colistin instead. For more information see <a href="#">International Consensus Guidelines on Optimal Use of Polymyxins</a></p>	<p><u>Adult &amp; Pediatric</u>  Loading dose for critically ill: 25,000 units/kg (range 20,000-30,000 units/kg)  Maintenance dose starting 12-24h after load:  12,500 units/kg q12h for moderately severe infections  15,000 units/kg q12h for severe, life-threatening infections</p>	<p><a href="#">No adjustments necessary.</a></p> <p>Note: Package insert was approved with adjustments prior to extensive pharmacokinetic evaluation. Subsequent literature found the drug is not renally eliminated</p>
<p>Posaconazole<sup>R</sup></p> <p><i>Restricted to ID service and hematology/oncology service</i></p>	<p><u>Adult &amp; Pediatric</u> (≥13 years for suspension and tablets, ≥18 years for injection)</p> <p><i>Suspension:</i>  200 mg q8h for prophylaxis  200 mg q6h for treatment</p> <p><i>Tablets &amp; Injection:</i>  300 mg PO/IV q12h x 1 day then 300 mg PO/IV q24h</p>	<p>No adjustment necessary</p> <p>Therapeutic drug monitoring is suggested; target trough at steady-state (7 days) is 0.7 mg/L for prophylaxis and <a href="#">&gt;1.25 mg/L for treatment</a></p>
<p>Primaquine</p>	<p><u>Adult</u>  15-30 mg (primaquine base) PO q24h</p> <p><u>Pediatric</u>  0.3 mg/kg (primaquine base) PO q24h</p>	<p>No clear recommendations, but adjustment probably not necessary (&lt;1% renal elimination)</p>
<p><a href="#">Pyrazinamide</a></p>	<p><u>Adult</u>  20-25 mg/kg PO q24h (Round to 500mg tablet)  40 to 55 kg: 1,000 mg once daily</p>	<p>CrCl &lt;30 or HD: 25-35 mg/kg three times weekly</p> <p>CAPD: No data</p>



	<p>56 to 75 kg: 1,500 mg once daily 76 to 90 kg: 2,000 mg once daily</p> <p>Based on estimated lean body weight. Optimal doses for obese patients are not established.</p> <p>----- <u>Pediatric &lt;15 years and &lt;40kg</u> 30-40 mg/kg PO q24h</p>	<p>----- CrCl &lt;30, HD: 40-50 mg/kg 3x/week CAPD: No data</p>
Pyrimethamine	<p><u>Adult</u> 50-100 mg PO q24h</p> <p><u>Pediatric</u> 1 mg/kg PO q12h</p>	No adjustment necessary
Ribavirin <sup>R</sup> <i>Restricted for RSV treatment to ID and heme/onc services</i>	<p><u>Adult</u> 400-600 mg PO q12h</p> <p><u>Pediatric</u> 200-400 mg PO q12h</p>	<i>Same for Adult &amp; Pediatric</i> CrCl <50: Contraindicated
Rifabutin	<p><u>Adult</u> 300 mg PO q24h</p> <p><u>Pediatric</u> 5 mg/kg PO q24h</p>	No adjustment necessary
Rifampin	<p><u>Adult</u> <i>Mycobacterial disease:</i> 10 mg/kg (600 mg) PO daily</p> <p><i>Prosthetic valve infective endocarditis:</i> 300 mg PO/IV q8h</p> <p><u>Pediatric</u> 10-20 mg/kg PO/IV q24h</p>	No adjustment necessary
Rimantadine	<p><u>Adult</u> 100 mg PO q12h</p> <p>----- <u>Pediatric</u> 5 mg/kg PO q24h</p>	CrCl <10: 100 mg PO q24h HD/CAPD: No data  ----- No clear recommendations
Sulfadiazine	<p><u>Adult</u> 2-4 g PO in 3-6 divided doses</p> <p><u>Pediatric</u> 37.5 mg/kg PO q6h</p>	No data
Tedizolid <sup>NF</sup>	<p><u>Adult</u> 200 mg IV/PO once daily</p> <p><u>Pediatric</u> Safety and efficacy not established</p>	No adjustment necessary



<p>Telavancin<sup>NF</sup></p>	<p><u>Adult</u> 10 mg/kg IV q24h</p> <p>-----</p> <p><u>Pediatric</u> Safety and efficacy not established</p>	<p>CrCl &gt;50: No adjustment necessary CrCl 30-50: 7.5 mg/kg IV q24h CrCl 10-29: 10 mg/kg IV q48h CrCl &lt;10: No data ESRD and HD: No data</p>
<p>Tigecycline<sup>R</sup></p> <p><i>Restricted to ID service</i></p>	<p><u>Adult</u> 100 mg IV load, then 50 mg IV q12h</p> <p>-----</p> <p><u>Pediatric</u> Safety and efficacy not established</p>	<p><i>Renal dysfunction:</i> No adjustment necessary</p> <p><i>Hepatic dysfunction (Child Pugh C):</i> 100 mg IV load then 25 mg IV q12h</p>
<p>Tobramycin</p> <p><i>Refer to PK training packet on ASP website<sup>§</sup></i></p>	<p><u>Adult</u> <i>Extended interval dosing:</i> 7 mg/kg once daily</p> <p>5 mg/kg/day may be used for UTIs</p> <p>(Refer to PK training packet on ASP website<sup>§</sup> for exclusions to extended-interval dosing)</p> <p>-----</p> <p><i>Traditional dosing:</i> 1.5-2.5 mg/kg IV q8h</p> <p>Monitoring of serum levels is recommended</p> <p>-----</p> <p><u>Pediatric</u> <i>Traditional dosing:</i> 1.5-2.5 mg/kg IV q8h</p>	<p><i>Extended interval dosing:</i> Frequency adjusted by serum level 6-14 hours after start of infusion and Hartford nomogram</p> <p>-----</p> <p><i>Traditional dosing (empiric):</i> CrCl 51-90: 60-90% q8-12h<sup>†</sup> CrCl 10-50: 30-70% q12h<sup>†</sup> CrCl &lt;10: 20-30% q24-48h<sup>†</sup> HD/CAPD: Dose according to levels</p>
<p>Trimethoprim/sulfamethoxazole (TMP/SMX)</p> <p>1 DS tablet = 160 mg TMP/800 mg SMX</p> <p>Oral suspension (per 5 mL) = 40 mg TMP/ 200 mg SMX</p>	<p><u>Adult</u> <i>PO</i> <i>Simple urinary tract infection:</i> 1 Bactrim DS tablet PO q12h</p> <p><i>Skin/soft tissue and other infections:</i> 1-2 Bactrim DS tablets PO q12h</p> <p><i>PCP treatment:</i> 15-20 mg/kg/day (TMP) PO divided q6-8h</p> <p><i>IV</i> <i>Skin/soft tissue and bone infection:</i> 8-10 mg/kg/day (TMP) divided q12h</p> <p><i>Moderate infections including Pneumonia other than Pneumocystis</i> 12-15 mg/kg/day (TMP) divided q8h</p>	<p><i>Adults &amp; Pediatrics, PO/IV</i></p> <p><i>UTI, skin, and other infections:</i> CrCl &lt;30: 50% of usual daily dose divided q12-24h</p> <p>HD: Dose as CrCl &lt;30; give dose daily, after HD on dialysis days</p> <p>-----</p> <p><i>PCP treatment:</i> CrCl 15-30: 15-20 mg/kg/day (TMP) q6-8h for 48 hours followed by 50% of usual daily dose divided q12h</p> <p>CrCl &lt;15: 50% of usual daily dose divided q12h</p>



	<p><i>Severe infections/Pneumocystis pneumonia</i> 15-20 mg/kg/day (TMP) IV divided q6-8h</p> <p>Use ideal body weight, consider an adjusted body weight in severely ill obese patients</p> <p>-----</p> <p><u>Pediatric</u> <i>PO/IV</i> <i>Simple urinary tract infection:</i> 5 mg/kg (TMP) PO q12h</p> <p><i>Skin/soft tissue and other infections:</i> 10 mg/kg/day (TMP) IV divided q12h</p> <p><i>Pneumocystis pneumonia treatment:</i> 15-20 mg/kg/day (TMP) IV divided q6-8h</p>	<p>HD: Dose as CrCl &lt;15; give dose daily, after HD on dialysis days</p>
Valacyclovir	<p><u>Adult</u> 2 g PO q12h</p> <p>1 g PO q8h</p> <p>1 g PO q12h</p> <p>1 g PO q24h</p> <p>500 mg PO q12h</p> <p>500 mg PO q24h</p> <p>-----</p> <p><u>Pediatric</u> Safety and efficacy not established</p>	<p>CrCl 30-49: 1 g PO q12h CrCl 10-29: 500 mg PO q12h CrCl &lt;10: 500 mg PO q24h</p> <p>CrCl 30-49: 1 g PO q12h CrCl 10-29: 1 g PO q24h CrCl &lt;10: 500 mg PO q24h</p> <p>CrCl 30-49: No adjustment necessary CrCl 10-29: 1 g PO q24h CrCl &lt;10: 500 mg PO q24h</p> <p>CrCl 30-49: No adjustment necessary CrCl 10-29: 500 mg PO q24h CrCl &lt;10: 500 mg PO q24h</p> <p>CrCl 30-49: No adjustment necessary CrCl 10-29: 500 mg PO q24h CrCl &lt;10: 500 mg PO q24h</p> <p>CrCl 30-49: No adjustment necessary CrCl 10-29: 500 mg PO q48h CrCl &lt;10: 500 mg PO 48h</p> <p>HD: Dose as CrCl &lt;10; give daily, dose after dialysis on dialysis days CAPD: 500 mg PO q48h</p>
Valganciclovir	<p><u>Adult</u> <i>Treatment, induction:</i> 900 mg PO q12h</p>	<p><u>Adult</u> <i>Treatment, induction:</i> CrCl 40-59: 50% PO same interval<sup>†</sup> CrCl 25-39: 50% PO q24h<sup>†</sup> CrCl 10-24: 50% PO q48h<sup>†</sup></p>





	<p><i>Treatment, maintenance:</i> 900 mg PO q24h</p> <p><i>Prophylaxis (dosing at NM):</i> 450 mg PO q24h</p> <p>-----</p> <p><u>Pediatric (usual dosing at NM)</u> <i>Treatment:</i> 14 mg/kg PO q12h</p> <p><i>Maintenance or prophylaxis:</i> 14 mg/kg PO daily</p>	<p>CrCl &lt;10, HD/CAPD: Use not recommended</p> <p><i>Treatment, maintenance:</i> CrCl 40-59: 50% PO same interval<sup>†</sup> CrCl 25-39: 50% PO q48h<sup>†</sup> CrCl 10-24: 50% PO twice weekly<sup>†</sup> CrCl &lt;10, HD/CAPD: Use not recommended</p> <p><i>Prophylaxis:</i> CrCl 25-39: same dose PO q48h<sup>†</sup> CrCl 10-24: 450 mg PO twice weekly<sup>†</sup> CrCl &lt;10, HD/CAPD: Use not recommended</p> <p>-----</p> <p><u>Pediatric</u> <i>Treatment:</i> CrCl 40-59: 50% PO same interval<sup>†</sup> CrCl 25-39: 50% PO q24h<sup>†</sup> CrCl 10-24: 50% PO q48h<sup>†</sup> CrCl &lt;10, HD/CAPD: Use not recommended</p> <p><i>Maintenance or prophylaxis:</i> CrCl 40-59: 50% PO same interval<sup>†</sup> CrCl 25-39: 50% PO q48h<sup>†</sup> CrCl 10-24: 50% PO twice weekly<sup>†</sup> CrCl &lt;10, HD/CAPD: Use not recommended</p>
<p>Vancomycin IV</p> <p><i>Refer to PK training packet on ASP website<sup>§</sup></i></p>	<p><u>Adult</u> <i>Standard dose:</i> 15-20 mg/kg IV q12h</p> <p>Consider 25 mg/kg x 1 loading dose in critically ill patients</p> <p>-----</p> <p><u>Pediatric</u> 15-20 mg/kg IV q6h</p>	<p>Dosing, therapeutic goals, and monitoring should be individualized for each patient to achieve troughs 10-20 mcg/mL. AUC &gt; 400 ideal</p> <p>Troughs of 15-20 mcg/mL are only recommended for patients with MRSA bacteremia, endocarditis, meningitis, pneumonia, osteomyelitis, or septic arthritis.</p> <p>-----</p> <p>CrCl 70-89: Same dose q8h CrCl 46-69: Same dose q12h CrCl 30-45: Same dose q18h CrCl 15-29: Same dose q24h CrCl &lt;15, HD/CAPD: Measure trough levels to determine when to dose.</p>
Vancomycin PO	<p>Mild-Severe: 125 mg PO q6h Severe-complicated CDI (with ileus): 500 mg PO q 6h</p>	No adjustment necessary
Voriconazole	<u>Adult &amp; Pediatric &gt;12 years &gt;50kg*</u>	<i>Hepatic dysfunction (Child Pugh A-B):</i>



	<p><i>Active disease:</i> Loading dose of 6 mg/kg (AdjBW) PO/IV q12h x 2 doses, then 4 mg/kg PO/IV q12h</p> <p><i>Prophylaxis:</i> 200 mg PO q12h (100 mg q12h if &lt;40 kg)</p> <p><u>Pediatrics</u> <i>Children 2-12 years</i> Loading Dose: 9mg/kg IV q12h x 2 doses Maintenance: 8 mg/kg IV or 9 mg/kg oral suspension q12h</p> <p><i>Adolescents 12-14 years &lt;50kg</i> &lt;50 kg: 9 mg/kg q12h x 2 doses, then 4-8 mg/kg q12h</p>	<p>6 mg/kg q12h x 2 doses then 50% of normal daily dose</p> <p><i>Renal dysfunction:</i> No adjustment necessary for PO formulation. Use IV formulation with caution if CrCl &lt;50, HD, or CAPD due to accumulation of cyclodextrin vehicle.</p> <p>*Therapeutic drug monitoring is suggested; target trough at steady-state (7 days) is <a href="#">2-5.5 mg/L</a></p>
Zanamivir	<p><u>Adult and Pediatric ≥7 years</u> <i>Treatment:</i> Two inhalations (10 mg total) twice daily for 5 days</p> <p><u>Adult and Pediatric ≥5 years</u> <i>Prophylaxis:</i> Two inhalations (10 mg total) once daily for daily for 10 days</p>	No adjustment necessary

<sup>NF</sup> Non-formulary agent

<sup>R</sup> Protected agent; refer to ASP website for formulary guidelines

\* Use Cockcroft-Gault equation for patients ≥18 years old and Schwartz equation for patients <18 years old

§ ASP website: [www.nebraskamed.com/asp](http://www.nebraskamed.com/asp)



## Antiretroviral Dosing Recommendations

The dosage recommendations for antiretrovirals (ARVs) listed in the table below are primarily directed at renal adjustments. The table below does not contain comprehensive information regarding dose adjustments for drug-drug or food-drug interactions. Please refer to detailed product information in other drug information sources as necessary.

Antiretroviral	Normal Dose	Renal Dosage Adjustment Based on CrCl Estimate (in mL/min)*
<b>Combination Tablets</b>		
Abacavir/dolutegravir/lamivudine (Triumeq)	<u>Adult</u> 1 tablet PO q24h  <u>Pediatric</u> Safety and efficacy not established	CrCl ≥50: No adjustment necessary CrCl <50: Not recommended
Abacavir/lamivudine (Epzicom)	<u>Adult &amp; Pediatric ≥25 kg</u> 1 tablet PO q24h	CrCl ≥50: No adjustment necessary CrCl <50: Not recommended
Abacavir/lamivudine/zidovudine (Trizivir) <sup>NF</sup>	<u>Adult</u> 1 tablet PO q12h  <u>Pediatric (≥40 kg)</u> 1 tablet PO q12h	CrCl ≥50: No adjustment necessary CrCl <50: Not recommended
Atazanavir/cobicistat (Evotaz) <sup>NF</sup>	<u>Adult</u> 1 tablet PO q24h  <u>Pediatric</u> Safety and efficacy not established	ESRD on HD: Use not recommended  Not recommended for CrCl <70 if used with TDF
Bictegravir, emtricitabine, tenofovir alafenamide (Biktarvy)	<u>Adult</u> 1 tablet PO q24h	CrCl ≥30mL/minute: no dosage adjustment necessary  CrCl <30mL/minute: use is not recommended
Darunavir/cobicistat (Prezcobix) <sup>NF</sup>	<u>Adult</u> 1 tablet PO q24h  <u>Pediatric</u> Safety and efficacy not established	Not recommended for CrCl <70 if used with TDF
Darunavir, cobicistat, emtricitabine, tenofovir alafenamide (Symtuza)	<u>Adult</u> 1 tablet PO q24h	CrCl ≥30mL/minute: no dosage adjustment necessary  CrCl <30mL/minute: use is not recommended
Dolutegravir, rilpivirine (Juluca)	<u>Adult</u> 1 tablet PO q24h	CrCl ≥30mL/minute: no dosage adjustment necessary  CrCl <30mL/minute: use with caution, increase monitoring for adverse effects, dolutegravir concentrations



		may be decreased leading to loss of effect and development of resistance  ESRD on HD: has not been studied
Doravirine, lamivudine, tenofovir disoproxil fumarate (Delstrigo)	<u>Adult</u> 1 tablet PO q24h	CrCl $\geq$ 50mL/minute: no dosage adjustment necessary  CrCl <50mL/minute: use is not recommended
Efavirenz/emtricitabine/tenofovir disoproxil fumarate (Atripla)	<u>Adult &amp; Pediatric (<math>\geq</math>12 years &amp; 40 kg)</u> 1 tablet PO q24h	CrCl $\geq$ 50: No adjustment necessary CrCl <50: Not recommended
Efavirenz, lamivudine, tenofovir disoproxil fumarate (Symfi, Symfi Lo)	<u>Adult</u> 1 tablet PO q24h  <u>Pediatric</u> $\geq$ 35 kg: 1 tablet PO q24h (Symfi Lo) $\geq$ 40 kg: 1 tablet PO q24h (Symfi)	CrCl $\geq$ 50mL/minute: no dosage adjustment necessary  CrCl <50mL/minute: use is not recommended  ESRD on HD: use is not recommended
Elvitegravir/cobicistat/emtricitabine/tenofovir alfenamide (Genvoya) <sup>NF</sup>	<u>Adult &amp; Pediatric (<math>\geq</math>12 years)</u> 1 tablet PO q24h	CrCl $\geq$ 30: No adjustment necessary CrCl <30: Not recommended
Elvitegravir/cobicistat/emtricitabine/tenofovir disoproxil fumarate (Stribild)	<u>Adult</u> 1 tablet PO q24h  <u>Pediatric</u> Safety and efficacy not established	Should not be initiated in patients with CrCl <70; discontinue if CrCl declines to <50 while on therapy
Emtricitabine/rilpivirine/tenofovir alafenamide (Odefsey) <sup>NF</sup>	<u>Adult &amp; Pediatric (<math>\geq</math>12 years &amp; 35 kg)</u> 1 tablet PO daily	CrCl $\geq$ 30: No adjustment necessary CrCl <30: Use not recommended
Emtricitabine/rilpivirine/tenofovir disoproxil fumarate (Complera) <sup>NF</sup>	<u>Adult &amp; Pediatric (<math>\geq</math>12 years)</u> 1 tablet PO q24h	CrCl $\geq$ 50: No adjustment necessary CrCl <50: Not recommended
Emtricitabine, tenofovir alafenamide (Descovy)	<u>Adult</u> 1 tablet PO q24h  <u>Pediatric</u> $\geq$ 25 kg: 1 tablet PO q24h	CrCl $\geq$ 30mL/minute: no dosage adjustment necessary  CrCl <30mL/minute: use is not recommended
Emtricitabine/tenofovir disoproxil fumarate (Truvada)	<u>Adult &amp; Pediatric (<math>\geq</math>35 kg)</u> 1 tablet PO q24h  ----- <u>Pediatric (<math>\geq</math>17 kg &amp; &lt;35 kg)</u> Use low strength tablets based on weight 17-21 kg: 1 tablet (100 mg/150 mg) PO q24h 22-27 kg: 1 tablet (133 mg/200 mg) PO q24h 28-34 kg: 1 tablet (167 mg/250 mg) PO q24h	CrCl $\geq$ 50: No adjustment necessary CrCl 30-49: 1 tablet q48h CrCl <30: Not recommended  ----- No data available



Lamivudine, tenofovir disoproxil fumarate (Cimduo)	<u>Adult</u> 1 tablet PO q24h  <u>Pediatric</u> <35 kg: not recommended ≥ 35 kg: 1 tablet PO q24h	CrCl ≥50mL/minute: no dosage adjustment necessary  CrCl <50mL/minute: use is not recommended  ESRD on HD: use is not recommended
Lamivudine/zidovudine (Combivir)	<u>Adult &amp; Pediatric (≥30 kg)</u> 1 tablet PO q12h	CrCl ≥50: No adjustment necessary CrCl <50: Not recommended
<b>Single Agent Tablets</b>		
Abacavir (ABC)	<u>Adult</u> 600 mg PO q24h or 300 mg PO q12h  <u>Pediatric</u> 8 mg/kg PO q12h	No adjustment necessary
Atazanavir (ATV)	<u>Adult</u> <i>Treatment-naïve:</i> 300 mg (+ RTV 100 mg) PO q24h  Unable to tolerate RTV: 400 mg PO q24h  With EFV: 400 mg (+ RTV 100 mg) PO q24h  <i>Treatment-experienced:</i> 300 mg (+ RTV 100 mg) PO q24h  With both H2RA and TDF: 400 mg PO q24h + RTV 100 mg PO q24h  <u>Pediatric (≥ 6 years)</u> <i>Treatment-naïve and treatment-experienced:</i> 15-19 kg: 150 mg (+ RTV 100 mg) PO q24h 20-39 kg: 200 mg (+ RTV 100 mg) PO q24h ≥40 kg: 300 mg (+ RTV 100 mg) PO q24h  <i>Treatment-naïve, unable to tolerate RTV (≥13 years, ≥40 kg):</i> 400 mg PO q24h	No adjustment necessary
Darunavir (DRV)	<u>Adult</u> <i>ARV-naïve or ARV-experienced with no DRV resistance mutations:</i> 800 mg (+ RTV 100 mg) PO q24h  <i>ARV-experienced with ≥1 resistance mutation:</i> 600 mg (+ RTV 100 mg) PO q12h  <u>Pediatric</u> <i>ARV-naïve or ARV-experienced with no DRV resistance mutations:</i>	No adjustment necessary



	<p>10-14 kg: 35 mg/kg (+ RTV 7 mg/kg) PO q24h  15-29 kg: 600 mg (+ RTV 100 mg) PO q24h  30-39 kg: 675 mg (+ RTV 100 mg) PO q24h  ≥40 kg: 800 mg (+ RTV 100 mg) PO q24h</p> <p><i>ARV-experienced with ≥1 resistance mutation:</i>  10-14 kg: 20 mg/kg (+ RTV 3 mg/kg) PO q12h  15-29 kg: 375 mg (+ RTV 48 mg) PO q12h  30-39 kg: 450 mg (+ RTV 60 mg) PO q12h  ≥40 kg: 600 mg (+ RTV 100 mg) PO q12h</p>	
Didanosine (DDI) enteric coated tablets <sup>NF</sup>	<p><u>Adult</u>  ≥60 kg: 400 mg PO q24h  ≥60 kg + TDF: 250 mg PO q24h</p> <p>&lt;60 kg: 250 mg PO q24h  &lt;60 kg + TDF: 200 mg PO q24h</p> <p>-----</p> <p><u>Pediatric</u>  100-120 mg/m<sup>2</sup> PO q12h</p>	<p>CrCl ≥60: No adjustment necessary  CrCl 30-59: 200 mg q24h  CrCl 10-29: 125 mg q24h  CrCl &lt;10, HD/CAPD: 125 mg q24h</p> <p>CrCl ≥60: No adjustment necessary  CrCl 30-59: 125 mg q24h  CrCl 10-29: 125 mg q24h  CrCl &lt;10, HD, or CAPD: 75 mg q24h  (use oral solution instead of EC tabs)</p> <p>-----</p> <p>HD: 25% of total dose q24h<sup>†</sup></p>
Dolutegravir (DTG)	<p><u>Adult</u>  <i>ARV-naïve or ARV-experienced, INSTI-naïve:</i>  50 mg PO q24h</p> <p><i>ARV-naïve or ARV-experienced, INSTI-naïve when coadministered with EFV, FPV/r, TPV/r, or rifampin:</i>  50 mg PO q12h</p> <p><i>INSTI-experienced with certain INSTI mutations or resistance:</i>  50 mg PO q12h</p> <p><u>Pediatric (≥12 years &amp; ≥40 kg)</u>  <i>ARV-naïve or ARV-experienced, INSTI-naïve:</i>  50 mg PO q24h</p>	No adjustment necessary
Doravirine (DOR)	<p><u>Adult</u>  <u>100mg PO once daily in combination with other antiretroviral agents</u></p>	<p>No dosage adjustments necessary</p> <p>ESRD on HD: not studied</p>
Efavirenz (EFV)	<p><u>Adult</u>  600 mg PO q24h</p> <p><u>Pediatric</u>  200-600 mg PO q24h</p>	No adjustment necessary
Elvitegravir (EVG)	<p><u>Adult</u>  <i>With ATV/r or LPV/r:</i></p>	No adjustment necessary



	<p>85 mg PO q24h</p> <p><i>With DRV/r, FPV/r, or TPV/r:</i> 150 mg PO q24h</p> <p><u>Pediatric</u> Safety and efficacy not established</p>	
Emtricitabine (FTC)	<p><u>Adult</u> <i>Capsule:</i> 200 mg PO q24h</p> <p><i>Solution:</i> 240 mg (24 mL) PO q24h</p> <p>-----</p> <p><u>Pediatric</u> <i>0-3 months:</i> Solution: 3 mg/kg oral PO q24h</p> <p><i>3 months-17 years:</i> Solution: 6 mg/kg PO q24h (max 240 mg) Capsule (&gt;33 kg): 200 mg PO q24h</p>	<p>CrCl <math>\geq</math>50: No adjustment necessary CrCl 30-49: 200 mg q48h CrCl 15-20: 200 mg q72h CrCl &lt; 15, HD: 200 mg q96h; give dose after HD on dialysis days</p> <p>CrCl <math>\geq</math>50: No adjustment necessary CrCl 30-49: 120 mg q24h CrCl 15-20: 80 mg q24h CrCl &lt; 15, HD: 60 mg q24h; give dose after HD on dialysis days</p> <p>-----</p> <p>No clear recommendations</p>
Enfuvirtide (T20) <sup>NF</sup>	<p><u>Adult</u> 90 mg subcutaneously q12h</p> <p><u>Pediatric (6-16 years)</u> 2 mg/kg subcutaneously q12h</p>	No adjustment necessary
Etravirine (ETV) <sup>NF</sup>	<p><u>Adults</u> 200 mg PO q12h</p> <p><u>Pediatric (6-17 years)</u> 16-19 kg: 100 mg PO q12h 20-24 kg: 125 mg PO q12h 25-29 kg: 150 mg PO q12h <math>\geq</math>30 kg: 200 mg PO q12h</p>	No adjustment necessary
Fosamprenavir (FPV)	<p><u>Adult</u> <i>Unboosted regimen:</i> 1400 mg PO q12h</p> <p><i>RTV-boosted regimen:</i> 1400 mg PO q24h (+ RTV 200 mg PO q24h) 1400 mg PO q24h (+ RTV 100 mg PO q24h) 700 mg PO q12h (+ RTV 100 mg PO q12h)</p> <p><u>Pediatric</u> &lt;11 kg: 45 mg/kg (+ RTV 7 mg/kg) PO q12h 11-14 kg: 30 mg/kg (+ RTV 3 mg/kg) PO q12h</p>	No adjustment necessary



	15-19 kg: 23 mg/kg (+ RTV 3 mg/kg) PO q12h ≥20 kg: 18 mg/kg (+ RTV 18 mg/kg) PO q12h	
Indinavir (IDV) <sup>NF</sup>	<u>Adult</u> <i>Unboosted regimen:</i> 800 mg PO q8h  <i>RTV-boosted regimen:</i> 800 mg PO q12h  <u>Pediatric</u> 500 mg/m <sup>2</sup> PO q8h	No adjustment necessary
Lamivudine (3TC)	<u>Adult</u> 300 mg PO q24h or 150 mg PO q12h  ----- <u>Pediatric</u> 2-4 mg/kg PO q12h	CrCl ≥50: No adjustment necessary CrCl 30-49: 150 mg q24h CrCl 15-29: 150 mg x 1 dose, then 100 mg q24h CrCl 5-14: 150 mg x 1 dose, then 50 mg q24h CrCl <5: 150 mg x 1 dose, then 25 mg q24h [Note: because lamivudine is well-tolerated and available in 100 mg tablets, some practitioners will prescribe 50 mg PO daily (half of a 100 mg tablet)]  HD/CAPD: Dose as CrCl <5. ----- No clear recommendations
Lopinavir/ritonavir (LPV/r)	<u>Adult</u> 400/100 mg PO q12h or 800 mg/200 mg PO q24h  <u>Pediatric</u> (based on lopinavir component) 10-13 mg/kg PO q12h	No clear recommendations, but adjustment probably not necessary  Avoid q24h dosing in HD patients
Maraviroc (MVC) <sup>NF</sup>	<u>Adult</u> <i>With potent CYP3A4 inhibitor (with or without a potent CYP3A inducer):</i> 150 mg PO q12h  <i>With other concomitant medications (TPV/r, NVP, RAL, all NRTIs and enfuvirtide):</i> 300 mg PO q12h  <i>With potent CYP3A inducers (without a potent CYP3A inhibitor):</i> 600 mg PO q12h	CrCl ≥30: No adjustment CrCl <30, ESRD on HD: Use not recommended  No adjustment necessary  CrCl ≥30: No adjustment CrCl <30, ESRD on HD: Use not recommended





	<u>Pediatric</u> Safety and efficacy not established	
Nelfinavir (NFV) <sup>NF</sup>	<u>Adult</u> 1250 mg PO q12h or 750 mg PO q8h  <u>Pediatric</u> 45-55 mg/kg PO q12h	No adjustment necessary
Nevirapine (NVP)	<u>Adult</u> 200 mg PO q24h x 14 days then increase to 200 mg PO q12h (IR tab) or 400 mg PO q24h (ER tab)  <u>Pediatric (≥15 days)</u> 150 mg/m <sup>2</sup> once daily x 14 days then increase to 150 mg/m <sup>2</sup> twice daily	CrCl ≥20: No adjustment necessary CrCl <20: No recommendation
Raltegravir (RAL)	<u>Adult &amp; Pediatric (≥16 years)</u> 400mg PO q12h  <i>With rifampin:</i> 800 mg PO q12h  <u>Pediatric</u> Safety and efficacy not established	No adjustment necessary
Rilpivirine (RVP) <sup>NF</sup>	<u>Adult &amp; Pediatric (≥12 years &amp; ≥35 kg)</u> 25 mg PO q24h  <u>Pediatric</u> Safety and efficacy not established	No adjustment necessary
Ritonavir (RTV)	<u>Adult</u> <i>Pharmacokinetic booster for PIs:</i> 100-200 mg PO q12-24h (100-400 mg/day)  <u>Pediatric</u> 400 mg/m <sup>2</sup> PO q12h	No adjustment necessary
Saquinavir (SQV) <sup>NF</sup>	<u>Adult</u> 1000 mg PO q12h  <u>Pediatric</u> Safety and efficacy not established	No adjustment necessary
Stavudine (D4T)	<u>Adult</u> <60 kg: 30 mg PO q12h ≥60 kg: 40 mg PO q12h  ----- <u>Pediatric (&lt;30 kg)</u> 1 mg/kg PO q12h	CrCl 26-50: 50% q12h <sup>†</sup> CrCl 10-25 and HD: 50% q24h <sup>†</sup> ; give dose after HD on dialysis days  ----- No recommendations



Tenofovir (TDF)	<u>Adult</u> 300 mg PO q24h  <u>Pediatric</u> 8 mg/kg PO q24h	<i>Same for Adult &amp; Pediatric</i> CrCl 30-49: 300 mg q48h CrCl 10-29: 300 mg twice weekly CrCl <10: No data  HD: 300 mg once weekly, give dose after HD on dialysis days
Tipranavir (TPV) <sup>NF</sup>	<u>Adult</u> 500 mg PO q12h  <u>Pediatric</u> Safety and efficacy not established	No adjustment necessary
Zidovudine (AZT)	<u>Adult</u> 300 mg PO q12h or 200 mg PO q8h  <i>IV for intrapartum administration:</i> 2 mg/kg IV over 1 hour, followed by continuous infusion of 1 mg/kg/hour  Refer to DHHS guidelines for dosage and duration for continuation post-partum ----- <u>Pediatric</u> PO: 160 mg/m <sup>2</sup> PO q8h IV: 120 mg/m <sup>2</sup> IV q6h	CrCl <15, HD/CAPD: 300 mg PO q24h or 100 mg PO q8h; give dose after dialysis on dialysis days  CrCl <15, HD/CAPD: 1 mg/kg IV q6-8h; give dose after dialysis on dialysis days  ----- No data

<sup>NF</sup> Non-formulary agent

<sup>R</sup> Restricted agent; refer to ASP website for restriction information

\* Use Cockcroft-Gault equation for patients ≥18 years old and Schwartz equation for patients <18 years old

† When the recommended renal dosage adjustment is listed as a percentage change, this indicates that X% of the originally ordered dose should be given, NOT that the dose should be decreased by X%. For example, an adult with a CrCl between 10-50 mL/min would receive 30-70% of the originally ordered dose.

§ ASP website: [www.nebraskamed.com/asp](http://www.nebraskamed.com/asp)

### **Selected References (General Renal Dose Adjustments):**

- Lexi-comp. Wolters Kluwer, 2018.
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- MICROMEDEX<sup>®</sup> Healthcare Series, 2012.
- Livornese LL, et al. Use of antibacterial agents in renal failure. *Infectious Disease Clinics of North America*. 2004;18:551-79.
- Taketomo CK, et al. *Pediatric Dosage Handbook*, 12<sup>th</sup> Edition, 2005.
- Aronoff GR, et al. *Drug Prescribing in Renal Failure*, 4<sup>th</sup> Edition, 1999.

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