

## UCSF MEDICAL CENTER

### ADULT ANTIMICROBIAL INTERMITTENT AND CONTINUOUS HEMODIALYSIS DOSING GUIDELINES

Approved by the Antimicrobial Subcommittee and the Pharmacy and Therapeutics Committee 06/2020

These dosing recommendations are meant as guidance based on available literature and should not replace clinical judgement. Antimicrobial dosing should always take into account factors specific to the patient (weight, renal function), antimicrobial (pharmacokinetics, pharmacodynamics, toxicities) and disease-state.

**IV-PO**= high oral bioavailability – Consider IV to PO Switch

Recommended dosing weights: **Ideal BW**= ideal body weight, **Total BW**= total body weight, **Adj BW**= adjusted body weight.

Dialysis: **HD**=intermittent (high-flux) hemodialysis. **CVVHD**= continuous veno-venous hemodialysis

CVVHD recommendations assume an ultrafiltration rate of 2 L/h with CVVHD and residual native GFR < 10 mL/min.

Antimicrobial	HD	CVVHD
<b>Acyclovir</b> <sup>IBW / Adj BW</sup> *If Total BW > 1.2 times Ideal BW, use Adj BW.	<u>Non-CNS HSV</u> : 2.5mg/kg IV x 1 now, then qPM <sup>2</sup> <u>HSV encephalitis/disseminated VZV</u> : 5mg/kg IV x1 now, then qPM <sup>2</sup>	<u>Non-CNS HSV</u> : 5mg/kg IV q12h <sup>2</sup> <u>HSV encephalitis/disseminated VZV</u> : 10mg/kg IV q12h <sup>2</sup>
<b>AmBisome</b> <sup>IBW / Adj BW</sup> (Liposomal amphotericin B) *If Total BW > 1.2 times Ideal BW, use Adj BW.	No adjustment <sup>1,2,5</sup>	No adjustment <sup>1,2,5</sup>
<b>Amoxicillin/clavulanate</b>	500 mg PO x1 now, then qPM <sup>10,11</sup>	500mg PO BID <sup>7</sup>
<b>Ampicillin</b> (Severe: meningitis, life-threatening)	<u>Mild/uncomplicated</u> : 2 g IV x1 now, then qPM <sup>2,11</sup> <u>Severe</u> : 2 g IV q12h <sup>2,11</sup>	<u>Mild/uncomplicated</u> : 2 g IV q8h <sup>11,12</sup> <u>Severe</u> : 2 g IV q6h <sup>11,12</sup>
<b>Ampicillin/sulbactam</b>	3 g IV q12h <sup>2,10,13,14</sup>	3 g IV q6h <sup>1,2</sup>
<b>Azithromycin</b> <sup>IV-PO</sup>	No adjustment <sup>2,5,10</sup>	No adjustment <sup>2,5</sup>
<b>Aztreonam</b> (Severe: meningitis, pseudomonas, life-threatening)	<u>Mild/uncomplicated</u> : 1 g IV x1 now, then qPM <sup>10,15,16</sup> <u>Severe</u> : 2 g IV x1 now, then qPM <sup>10,15,16</sup>	2 g IV q12h <sup>1,2</sup>
<b>Caspofungin</b>	No adjustment <sup>2,5</sup>	No adjustment <sup>2,5,7</sup>
<b>Cefazolin</b> ^Consider dosing strategy for patients not on stable TIW HD schedule	2 g IV x1 now, then post-HD. <sup>11</sup> <u>Alt</u> : 1 g IV x1 now, then qPM <sup>^2,6,11,17</sup>	2 g IV q12h <sup>1,2</sup>
<b>Cefepime</b> ^Consider dosing strategy for patients not on stable TIW HD schedule *Higher doses may be required for severe infections and/or high ultrafiltration rates – consult ID pharm	2 g IV x1 now, then post-HD <sup>21,22</sup> <u>Alt</u> : 1 g IV x1 now, then qPM <sup>^2</sup>	1 g IV Q8h* <sup>1-3,18-20</sup>

Antimicrobial	HD	CVVHD
<b>Ceftazidime</b>	1 g IV x1 now, then post-HD <sup>24,25</sup>	2 g IV q12h <sup>4,9,23</sup>
<b>Ceftriaxone</b>	No adjustment <sup>1,2,4</sup>	No adjustment <sup>1,2,4</sup>
<b>Ciprofloxacin</b> <sup>IV-PO</sup>	400 mg IV qPM <sup>5,10</sup> 500 mg PO qPM	400 mg IV q12h <sup>1,2,5,26-29</sup> 500 mg PO q12h
<b>Clindamycin</b> <sup>IV-PO</sup>	No adjustment <sup>2,5,30,31</sup>	No adjustment <sup>1,2,5,7,8</sup>
<b>Daptomycin</b> <sup>TBW / Adj BW</sup> If Total BW > 1.2 times Ideal BW, use Adj BW.  <u>Not</u> effective for treatment of pneumonia.  ^Consider dosing strategy for patients not on stable TIW HD schedule  *Consider this dose for patients receiving high ultrafiltration rates (ex. > 2L/hr) and/or patients with severe infections (ex. endocarditis) and/or receiving combination therapy (ex. with ceftaroline)	8-10 mg/kg IV q48h (post-HD on HD days) <sup>^33,39-43</sup>  <u>Alt:</u> 8-10 mg/kg IV post-HD <sup>33,39-43</sup>	6 mg/kg IV q24h <sup>**3,32,34-36</sup>  <u>Alt:</u> 8-10 mg/kg IV q48h <sup>*33,37,38</sup>  <i>Consult ID pharm for complex cases or if used as combination therapy</i>
<b>Doxycycline</b> <sup>IV-PO</sup>	No adjustment <sup>2,5,44</sup>	No adjustment <sup>2,5,7,8</sup>
<b>Ertapenem</b>	500mg IV qPM  Alt: 500 mg*-1 g IV x1 now, then post-HD <sup>47-49</sup>  *Consider 500mg for patients who are elderly or with low body weight (< 40kg)	1 g IV q24h <sup>45,46</sup>
<b>Ethambutol</b> <sup>IBW</sup>	15-25 mg/kg PO x1 now, then post-HD <sup>10,50</sup>	15-20 mg/kg PO q24h <sup>51</sup> 40 – 55kg: 800mg PO q24h 56 – 75kg: 1200mg PO q24h 76 – 90kg: 1600mg PO q24h
<b>Fluconazole</b> <sup>IV-PO</sup>	Dose* IV/PO x1 now, then post-HD <sup>11</sup>  Oropharyngeal: 100 mg Esophageal: 200 mg Systemic Candidiasis: 400 mg Severe: 400 mg	<u>Oropharyngeal:</u> 200mg IV/PO q24h <sup>11</sup> <u>Esophageal:</u> 400mg IV/PO q24h <sup>11</sup> <u>Candidiasis:</u> 800mg IV/PO q24h <sup>11</sup> <u>Severe:</u> 800-1200mg IV/PO/day, divided q12h - 24h <sup>11,52-56</sup>

Antimicrobial	HD	CVVHD
<b>Gentamicin</b> <sup>IBW / Adj BW</sup> If Total BW > 1.2 times Ideal BW, use Adj BW.  *Contact ID or ICU pharmacy for dosing guidance & monitoring  In traditional dosing for gram (-) infections, monitor peak (5 – 8 mg/L) and trough (< 2 mg/L) levels.	<u>Gram (+) synergy</u> : 1 mg/kg IV q48h-72h*  <u>Traditional gram (-)</u> : 2 mg/kg IV x1, then 1 mg/kg IV post-HD*	<u>Gram (+) synergy</u> : 1 mg/kg IV q24h*  <u>Traditional gram (-)</u> : 2 mg/kg IV x1, then 1.5 mg/kg IV post-HD*
<b>Isavuconazole</b> <sup>IV-PO</sup>	No adjustment <sup>5</sup>	No adjustment <sup>5</sup>
<b>Isoniazid</b> <sup>IV-PO</sup>	300 mg IV/PO qPM <sup>7,10,50,77,78</sup>	300mg IV/PO q24h <sup>7,8</sup>
<b>Levofloxacin</b> <sup>IV-PO</sup>	500 mg IV/PO x 1 now, then 250 mg IV/PO q48g (post-HD on HD days) <sup>5,10,11,58</sup>  <u>Pneumonia/Pseudomonas</u> : 750 mg IV/PO x 1 now, then 500 mg IV/PO q48h (post-HD on HD days) <sup>5,10,11,58</sup>	750mg IV/PO x 1 now, then 250-500 mg IV/PO q24h <sup>2,6,26,57</sup>
<b>Linezolid</b> <sup>IV-PO</sup>	No adjustment <sup>2,5,10,63,64</sup>	No adjustment <sup>2,5,7,8,59-62</sup>
<b>Meropenem</b>	500 mg IV x1 now, then qPM <sup>2,10</sup>	1 g IV q8h <sup>65-68</sup>
<b>Metronidazole</b> <sup>IV-PO</sup>	No adjustment <sup>2</sup>	No adjustment <sup>2</sup>
<b>Moxifloxacin</b> <sup>IV-PO</sup>	No adjustment <sup>5</sup>	No adjustment <sup>1,2,5,9</sup>
<b>Nafcillin</b>	No adjustment <sup>1,2,69</sup>	No adjustment <sup>1,2,69</sup>
<b>Oseltamivir</b>	30mg PO x1 now, then post-HD <sup>11,70</sup>	75mg PO BID <sup>71,72</sup>
<b>Penicillin G</b> (Severe: meningitis, endovascular, life-threatening)	<u>Mild/uncomplicated</u> : 2 million units IV q12h <sup>11</sup>  <u>Severe</u> : 2 million units IV q6h <sup>11</sup>	<u>Mild/uncomplicated</u> : 2 million units IV q6h <sup>2,11</sup>  <u>Severe</u> : 3 million units IV q4h <sup>2,11</sup>
<b>Piperacillin/Tazobactam</b> EI: extended infusion (administered over 4 hours)	2.25 g IV q8h (short infusion) <sup>10,76</sup>	4.5 g x 1, then 4.5 g IV EI q8h <sup>4,73-75</sup>
<b>Posaconazole</b>	No adjustment <sup>5</sup>	No adjustment <sup>5</sup>
Antimicrobial	HD	CVVHD

<b>Pyrazinamide</b> <sup>lBW</sup>	25-35 mg/kg PO post-HD <sup>7,10,11,50,51,77</sup>	20-25 mg/kg PO q24h <sup>10,11,79</sup> 40 – 55kg: 1000mg PO q24h 56 – 75kg: 1500mg PO q24h 76 – 90kg: 2000mg PO q24h
<b>Rifampin</b>	No adjustment <sup>2,5,10,50,51,77,78</sup>	No adjustment <sup>2,5,7,8</sup>
<b>Tobramycin</b> <sup>lBW / Adj BW</sup> If Total BW > 1.2 times Ideal BW, use Adj BW.  *Contact ID or ICU pharmacy for dosing guidance & monitoring  In traditional dosing for gram (-) infections, monitor peak (5 – 8 mg/L) and trough (< 2 mg/L) levels.	<u>Traditional gram (-):</u> 2mg/kg IV x1, then 1 mg/kg IV post-HD*	<u>Traditional gram (-):</u> 2 mg/kg IV x 1, then 1.5 mg/kg q24h*
<b>Trimethoprim (TMP)/ Sulfamethoxazole (SMX)</b> <sup>IV-PO, TBW / AdjBW*</sup>  <u>SS Tablet:</u> 80mg TMP <u>DS Tablet:</u> 160mg TMP *May consider Total BW for serious infections	<u>Systemic GNR infections:</u> 2.5 – 5 mg TMP/kg IV/PO qPM <sup>11</sup>  <u>Pneumocystis pneumonia:</u> 5 – 10 mg TMP/kg IV/PO qPM <sup>11</sup>  Alt: 5-15 mg TMP/kg 3 times weekly post-HD <sup>2,82</sup>	<u>Systemic GNR infections:</u> 5-7.5 mg TMP/kg/day IV divided q12-24h <sup>2</sup>  <u>Pneumocystis pneumonia:</u> 10-15 mg TMP/kg/day IV divided q12-24h <sup>2,80-82</sup>
<b>Voriconazole</b> <sup>IV-PO, TBW / AdjBW</sup> IV formulation should be avoided if possible in patients with CrCl < 50 mL/min due to accumulation of IV vehicle.	No adjustment <sup>2,5</sup>	No adjustment <sup>1,2,5,8</sup>

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