Stanford Health Care Antimicrobial Dosing Reference Guide

This document is also located on the SHC Intranet (http://portal.stanfordmed.org/depts/AntimicrobialStewardshipProgram) and http://bugsanddrugs.stanford.edu ▵ ABX Subcommittee Approved: September 2020

Formulas for dosing weights: Ideal body weight IBW (male) = 50kg + (2.3 x height in inches > 60 inches) · Ideal body weight IBW (female) = 45kg + (2.3 x height in inches > 60 inches) · Adjusted Body Weight ABW (kg) = IBW + 0.4 (TBW – IBW)

<table>
<tr><th>Drug</th><th>CrCl > 50 mL/min</th><th>CrCl 10 – 50 mL/min</th><th>CrCl < 10 mL/min</th><th>Intermittent Hemodialysis (IHD)</th><th>CRRT</th></tr>
<tr><td>Acyclovir (IV) [1–7]
(Use adjusted BW for obese)</td><td colspan="5">
<table>
<tr><th></th><th>CrCL > 50</th><th>CrCL 25 – 50</th><th>CrCL < 25</th><th>CrCL < 10</th><th>IHD</th><th>CRRT</th></tr>
<tr><td colspan="7">Prophylaxis</td></tr>
<tr><td>BMT</td><td>250 mg/m^2 q12h</td><td>125 mg/m^2 q12h</td><td>125 mg/m^2 q24h</td><td>62.5 mg/m^2 q24h</td><td>62.5 mg/m^2 q24h</td><td>125 mg/m^2 q12h</td></tr>
<tr><td>Hematology/Oncology</td><td>2 mg/kg q12h</td><td>2 mg/kg q12h</td><td>2 mg/kg q24h</td><td>1 mg/kg q24h</td><td>1 mg/kg q24h</td><td>2 mg/kg q12h</td></tr>
<tr><td colspan="7">Treatment</td></tr>
<tr><td>General (e.g. mucocutaneous HSV)</td><td>5 mg/kg q8h</td><td>5 mg/kg q12h</td><td>5 mg/kg q24h</td><td>2.5 mg/kg q24h</td><td>2.5 mg/kg q24h</td><td>5 – 10 mg/kg q12h</td></tr>
<tr><td>Severe (e.g. CNS/ ocular/disseminated HSV infections, Zoster)</td><td>10 mg/kg q8h</td><td>10 mg/kg q12h</td><td>10 mg/kg q24h</td><td>5 mg/kg q24h</td><td>5 mg/kg q24h</td><td>10 mg/kg q12h</td></tr>
</table>
</td></tr>
<tr><td>Acyclovir (PO) [1,2,7]</td><td colspan="5">
<table>
<tr><th></th><th>CrCL > 50</th><th>CrCL 25 – 50</th><th>CrCL < 25</th><th>CrCL < 10</th><th>IHD</th><th>CRRT</th></tr>
<tr><td colspan="7">Prophylaxis</td></tr>
<tr><td>BMT</td><td>800 mg BID</td><td>400 mg BID</td><td>200 mg BID</td><td>200 mg daily</td><td>200 mg daily</td><td>No data</td></tr>
<tr><td>Hematology/Oncology</td><td>400 mg BID</td><td>400 mg BID</td><td>200 mg BID</td><td>200 mg daily</td><td>200 mg daily</td><td>No data</td></tr>
<tr><td colspan="7">Treatment</td></tr>
<tr><td>General (e.g. mucocutaneous HSV)</td><td colspan="2">400 mg q8h
Alt: 200 mg 5x daily</td><td>200 mg q8h</td><td>200 mg q12h</td><td>200 mg q12h</td><td>No data</td></tr>
<tr><td>Severe (e.g. CNS/ ocular/disseminated HSV infections, Zoster)</td><td colspan="2">800 mg q4h (or 5x daily)
Consider valacyclovir for less frequent dosing</td><td>800 mg q8h</td><td>800 mg q12h</td><td>800 mg q12h</td><td>No data</td></tr>
</table>
</td></tr>
<tr><td>Amikacin[1,2,5,8,9]
(Use adjusted BW in obese)
Refer to Aminoglycoside Dosing Guide</td><td colspan="3">
<table>
<tr><th></th><th>CrCl > 60</th><th>CrCl 40 – 60</th><th>CrCl 20 – 40</th><th>CrCl < 20</th></tr>
<tr><td>Conventional dosing</td><td>5 – 7.5 mg/kg q8h</td><td>5 – 7.5 mg/kg q12h</td><td>5 – 7.5 mg/kg q24h</td><td rowspan="2">5 mg/kg load, then by level

alt: 7.5 mg/kg q48–72h</td></tr>
<tr><td>High-dose extended-interval dosing</td><td>15 – 20 mg/kg q24h</td><td>15 mg/kg q36h</td><td>CrCl > 30: 15 mg/kg q48h
CrCl < 30: Not recommended</td></tr>
</table>
Timing of levels: Draw trough 30 min prior to 4th dose. Draw peak 30 min after infusion ends
Once daily dosing: goal peak 35 – 60 mcg/mL; goal trough < 4 mcg/mL
Conventional dosing: goal peak 25 – 35 mcg/mL for serious infections; 15 – 20 mcg/mL for UTI; goal trough < 4 – 8 mcg/mL</td><td>5 – 7.5 mg/kg post HD only

consult pharmacist</td><td>10 mg/kg load, then 7.5 mg/kg q24–48h

Severe/MDR organism: 25 mg/kg q48h

consult pharmacist</td></tr>
<tr><td>Amoxicillin (PO)[1,2]</td><td>Usual dose: 500 – 1,000mg q8-12h or 875 mg q12h
CAP: 1,000 mg q8h
H pylori: 1,000 mg q12h
Procedural ppx: 2,000 mg x 1</td><td>CrCl 10–30: 250 – 500 mg q12h</td><td>250 – 500 mg q24h</td><td>250 – 500 mg q24h; administer additional dose at the end of dialysis</td><td>No data</td></tr>
<tr><td>Amoxicillin/clavulanate (PO)[1,2]</td><td>Usual dose: 250 – 500 mg q8h or 875 mg q12h</td><td>CrCl <30: Do not use 875 mg tablet
CrCl 10 – 30: 250 – 500 mg q12h</td><td>250 – 500 mg q24h</td><td>250 – 500 mg q24h; administer additional dose at the end of dialysis</td><td>No data</td></tr>
<tr><td>Amphotericin B Liposomal[1,2]
(Consider adjusted BW in obese)</td><td>3 – 5 mg/kg/day</td><td>No change</td><td>No change</td><td>No change</td><td>No change</td></tr>
<tr><td>Ampicillin (IV)[1–3]</td><td>Mild/uncomplicated: 1 – 2 g q6h
Meningitis/endovascular/PJI: 2 g q4h</td><td>Mild/uncomplicated: 1 g q6–8h
Meningitis/endovascular /PJI: 2 g q6–12h</td><td>Mild/uncomplicated: 1 g q12h
Meningitis/endovascular /PJI: 2 g q12–24h; or 1 g q8h</td><td>Mild/uncomplicated: 1 g q12h
Meningitis/endovascular/PJI: 2 g q12–24h</td><td>CVVH: 2 g q8–12H
CVVHDF: 2 g q6–8h
Meningitis/endovascular /PJI: 2 g q6h</td></tr>
<tr><td>Ampicillin/sulbactam[1–3,5]</td><td>1.5 – 3 g q6h</td><td>CrCl < 30: 1.5 – 3 g q12h</td><td>CrCl < 15: 1.5 – 3 g q24h</td><td>1.5 – 3 g q12–24h
Dose daily, but after HD on HD days</td><td>3 g q6–8h</td></tr>
<tr><td>Azithromycin (IV/PO)[1,2]</td><td>500 mg q24h</td><td>No change</td><td>No change</td><td>No change</td><td>No change</td></tr>
<tr><td>Aztreonam[1–3,10]
Severe: pseudomonas, life-threatening infections</td><td>1 – 2 g q8h
Severe/Meningitis: 2 g q6–8h</td><td>CrCl < 30: 1 g q8h
Severe/Meningitis: 1 g q6–8h</td><td>500 mg q8h
Severe/Meningitis: 1g q12h</td><td>1 g q24h
Severe/Meningitis: 1 g q12h</td><td>2 g load, then 1 g q8h – or – 2 g q12h</td></tr>
<tr><td>Caspofungin[1,2,11,11–13]</td><td colspan="3">70 mg x 1, then 50 mg q24h
70 mg q24h if on phenytoin, rifampin, other strong enzyme inducers
Endocarditis/Endovascular: 150 mg q24h
Dosage adjustments are not required for Child-Pugh B or C cirrhosis</td><td>No change</td><td>No change</td></tr>
<tr><td>Cefazolin[1–5,14]</td><td>CrCl ≥ 35:
Mild/moderate: 1 g q8h
Severe: 2 g q8h</td><td>CrCl 10 – 34:
Mild/moderate: 1 g q12h
Severe: 2 g q12h</td><td>Mild/moderate: 1g q24h
Severe: 2 g q24h</td><td>1 g q24h
Dose daily, but after HD on HD days
alt: 2g/2g/3g post-HD only</td><td>2 g q12h</td></tr>
</table>

<table>
<tr><th>Drug</th><th>CrCl > 50 mL/min</th><th>CrCl 10 – 50 mL/min</th><th>CrCl < 10 mL/min</th><th>Intermittent Hemodialysis (IHD)</th><th>CRRT</th></tr>
<tr><td>Cefepime[1–3,5,15–17]</td><td colspan="3"><table>
<tr><td colspan="5">Extended Infusion (4-hour infusion)</td></tr>
<tr><td></td><td>CrCl > 60</td><td>CrCl 30 – 60</td><td>CrCl < 11-29</td><td>CrCl < 10</td></tr>
<tr><td>General</td><td>1 g q8h or
2 g q12h</td><td>1 g q12h or
2 g q24h</td><td>1 g q24h</td><td>0.5 g q24h</td></tr>
<tr><td>Severe/CNS/FN/
CF exacerbation/
confirmed
Pseudomonal
infection</td><td colspan="2">2 g q8h</td><td>2 g q12h</td><td>1 g q12h</td><td>1 g q24h</td></tr>
</table></td><td>0.5 – 1 g q24h
Dose daily, but after HD on HD days

alt: 2 g post-HD only</td><td>2 g load, then 1 g q8h (4-hour infusion)</td></tr>
<tr><td>Cefpodoxime (PO)[1,2]</td><td>Uncomplicated cystitis:
100 mg q12h
CAP/bronchitis: 200 mg q12h
Skin/skin structure:
400 mg q12h</td><td colspan="2">CrCl < 30: same dose q24h</td><td>Same dose, post-HD only</td><td>No data</td></tr>
<tr><td>Ceftaroline[1,2,18]
(SHC Restriction)</td><td colspan="3"><table>
<tr><td></td><td>CrCl > 50</td><td>CrCl 30 – 50</td><td>CrCl 15 – 30</td><td>CrCl < 15</td></tr>
<tr><td>General</td><td>600 mg q12h</td><td>400 mg q12h</td><td>300 mg q12h</td><td>200 mg q12h</td></tr>
<tr><td>Endocarditis/
S.aureus bacteremia,
Susceptible-dose
dependent (SDD)</td><td>600 mg q8h
administered
over 2-hr</td><td>400 mg q8h
administered
over 2-hr</td><td>300 mg q8h
administered
over 2-hr</td><td>200 mg q8h
administered
over 2-hr</td></tr>
</table></td><td>200 mg q8–12h

Endocarditis/S.aureus
bacteremia/ SDD:
200 mg q8–12h
administered over 2-hr</td><td>No data</td></tr>
<tr><td>Ceftazidime (IV)[1–3,19]</td><td>Usual dose: 1 – 2 g q8h
Severe: 2 g q8h</td><td>CrCl 30 – 50: 1 – 2 g q12h
CrCl 16 – 30: 1 – 2 g q24h
CrCl 6 – 15: 0.5 – 1 g q24h</td><td>CrCl < 5: 0.5 g q24h</td><td>0.5 – 1 g q24h
Dose daily, but after HD on HD days
alt: 1 – 2 g q48–72h or
1 g post-HD only TIW</td><td>2 g load, then 1 g q8h
– or –
2 g q12h</td></tr>
<tr><td>Ceftazidime/avibactam
[1,2,20–23]
(SHC Restriction)</td><td>2.5 g q8h</td><td>CrCl 31 – 50: 1.25 g q8h
CrCl 16 – 30: 0.94 g q12h
CrCl 6 – 15: 0.94 g q24h</td><td>CrCl < 5: 0.94 g q48h</td><td>0.94 g q24–48h
Dose daily, but after HD on HD days</td><td>1.25g q8h
2.5g q8h if MIC > 4
mcg/mL or deep-seated</td></tr>
<tr><td>Ceftolozane/tazobactam
[1,2,24–26]
(SHC Restriction)</td><td colspan="3"><table>
<tr><td></td><td>CrCl > 50</td><td>CrCl 30 – 50</td><td>CrCl 15 – 29</td><td>CrCl < 15</td></tr>
<tr><td>General</td><td>1.5 g q8h</td><td>750 mg q8h</td><td>375 mg q8h</td><td>750 mg load,
then 150 mg
q8h</td></tr>
<tr><td>Hospital-acquired/
Ventilator-associated
pneumonia</td><td>3 g q8h</td><td>1.5 g q8h</td><td>750 mg q8h</td><td>2.25 g load,
then 450 mg
q8h</td></tr>
</table></td><td>General: 750 mg load, then
150 mg q8h

HAP/VAP: 2.25 g load, then
450 mg q8h</td><td>1.5 – 3 g IV q8h</td></tr>
<tr><td>Ceftriaxone (IV)[1,2,27]</td><td colspan="2">1 – 2 g q24h
Endovascular/osteomyelitis/PJI: 2 g q24h
Meningitis, E. faecalis endocarditis: 2 g q12h</td><td>No change</td><td>No change</td><td>No change</td></tr>
<tr><td>Cephalexin (PO)[1,2,28]</td><td>250 – 1000 mg q6h
Uncomplicated cystitis:
500 mg q12h
Cellulitis/SSTI: 500 mg q6h</td><td colspan="2">CrCl 15 – 29: 250 mg q8–12h
CrCl 5 – 14: 250 mg q24h</td><td>500 mg q24h
Dose daily, but after HD on HD days</td><td>No data</td></tr>
<tr><td>Ciprofloxacin (IV/PO)[1–4,22,29]</td><td colspan="3"><table>
<tr><td></td><td>CrCl > 50</td><td>CrCl 30 – 50</td><td>CrCl < 30</td></tr>
<tr><td>General infections</td><td>400 mg IV q12h
500 mg PO q12h</td><td>Same</td><td>400 mg IV q24h
500 mg PO q24h</td></tr>
<tr><td>Pseudomonas,
severe</td><td>400 mg IV q8h
750 mg PO q12h</td><td>400 mg IV q8–12h
500 mg PO q12h</td><td>400 mg IV q24h
500 mg PO q24h</td></tr>
</table></td><td>200 – 400 mg IV q24h
250 – 500 mg PO q24h
Dose daily, but after HD on HD days</td><td>400 mg IV q12h
500 mg PO q12h
Severe infection with
A.baumannii or
P.aeruginosa:
400 mg IV q8-12h</td></tr>
<tr><td>Clindamycin[1,2]</td><td>600 – 900 mg IV q8h
150 – 450 mg PO q6h</td><td>No change</td><td>No change</td><td>No change</td><td>No change</td></tr>
<tr><td>Colistin (IV)[1–3,30–32]
(SHC Restriction)
(Dosage expressed in terms of colistin base activity [CBA]; Use ideal BW in obese)</td><td colspan="3">U.S. FDA Package Insert<table>
<tr><td></td><td>CrCl > 80</td><td>CrCl 50 – 79</td><td>CrCl 30 – 49</td><td>CrCl < 30</td></tr>
<tr><td>Loading Dose</td><td colspan="4">5 mg/kg x 1 (max dose: 300 mg)</td></tr>
<tr><td>Maintenance Dose</td><td>1.25 – 2.5 mg/kg q12h</td><td>1.25 – 1.9 mg/kg q12h</td><td>2.5 mg/kg q24h</td><td>1.5 mg/kg q36h</td></tr>
</table>Preferred Dosing for Critically Ill Patients (Consult ID Pharmacist)<table>
<tr><td></td><td>CrCl</td><td>Dosing Regimen</td></tr>
<tr><td>Loading Dose</td><td></td><td>300 mg CBA x 1</td></tr>
<tr><td rowspan="12">Maintenance Dose</td><td>> 90 mL/min</td><td>180 mg q12h</td></tr>
<tr><td>80 – 89 mL/min</td><td>170 mg q12h</td></tr>
<tr><td>70 – 79 mL/min</td><td>150 mg q12h</td></tr>
<tr><td>60 – 69 mL/min</td><td>138 mg q12h</td></tr>
<tr><td>50 – 59 mL/min</td><td>122 mg q12h</td></tr>
<tr><td>40 – 49 mL/min</td><td>110 mg q12h</td></tr>
<tr><td>30 – 39 mL/min</td><td>98 mg q12h</td></tr>
<tr><td>20 – 29 mL/min</td><td>88 mg q12h</td></tr>
<tr><td>10 – 19 mL/min</td><td>80 mg q12h</td></tr>
<tr><td>5 – 9 mL/min</td><td>72 mg q12h</td></tr>
<tr><td>0 mL/min</td><td>65 mg q12h</td></tr>
</table>Suggested loading dose and daily doses of colistimethate for desired target colistin Css,avg of 2 mg/L (CID 2017:64. Nation et al)</td><td>Loading Dose:
300 mg CBA x 1

Maintenance Dose:
130 mg CBA q24h; then supplement an additional 40 mg CBA (for a 3-hr IHD session) or 50 mg CBA (for a 4-hr IHD session) post-dialysis

alt: 1.5 mg/kg q24h</td><td>Loading Dose:
300 mg CBA x 1

Maintenance Dose:
220 mg CBA q12h

Alt: 100 mg CBA q8h

Note: These are general recommendations (based on dialysis flow/ultrafiltration rates of 1-2 L/hr and minimal residual renal function. Refer to ESCMID/EUCAST guidelines</td></tr>
<tr><td>Daptomycin[1,2,33–39]
(SHC Restriction)
(Use adjusted BW in obese)</td><td>Skin/Soft tissue:
4 – 6 mg/kg q24h
Bacteremia/Endovascular:
8 mg/kg q24h
E. faecium infections:
10 – 12 mg/kg q24h; consult ID</td><td>CrCl < 30:
Same dose q48h</td><td>Same dose q48h</td><td>Same dose q48h
Dose q48h, but after HD on HD days

alt: ≥ 6 mg/kg post-HD only or
6/6/9 mg/kg post-HD only</td><td>6 – 8 mg/kg q24h

Doses > 8mg/kg q24h increases the risk of CPK elevations and myopathy. Caution, clinical judgement and frequent monitoring for higher doses</td></tr>
</table>

<table>
<tr><th>Drug</th><th>CrCl > 50 mL/min</th><th>CrCl 10 – 50 mL/min</th><th>CrCl < 10 mL/min</th><th>Intermittent Hemodialysis (IHD)</th><th>CRRT</th></tr>
<tr><td>Doxycycline (IV/PO)[1,2]</td><td>(Load: 200 mg x 1 for severe infections)
100 mg q12h</td><td>No change</td><td>No change</td><td>No change</td><td>No change</td></tr>
<tr><td>Ertapenem (IV/IM)[1,2,40–42]</td><td>1 g q24h</td><td>CrCl <30: 500 mg q24h</td><td>500 mg q24h</td><td>500 mg q24h
Dose daily, but after HD on HD days
alt: 500 - 1000 mg post-HD (low vs. high-flux HD, degree of renal failure, residual UOP)</td><td>1 g q24h</td></tr>
<tr><td>Ethambutol (PO)[1,5,43,44]
(Use lean BW if obese)
(See footnote for lean BW equation)</td><td>Dose range:
15 – 25 mg/kg/day
(max dose: 1,600 mg/day)<table><tr><th>Lean body weight</th><th>Dose</th></tr><tr><td>40 – 55 kg</td><td>800 mg</td></tr><tr><td>56 – 75 kg</td><td>1,200 mg</td></tr><tr><td>76 – 90 kg</td><td>1,600 mg</td></tr></table></td><td>CrCl 10 – 50:
15 – 25 mg/kg q24–36h</td><td>CrCl < 10:
15 – 25 mg/kg q48h</td><td>15 – 25 mg/kg 3 times per week post-HD
Administer after HD only</td><td>15 – 25 mg/kg q24–36h</td></tr>
<tr><td>Fidaxomicin (PO)[1,2]
(SHC Restriction)</td><td>200 mg q12h x 10 days</td><td>No change</td><td>No change</td><td>No change</td><td>No change</td></tr>
<tr><td>Fluconazole (IV/PO)[1–4,13,22,45]
Dose by indication. Load 800 mg for candidemia</td><td>200 – 400 mg q24h
C.glabrata
800 mg q24h
Severe/CNS/endovascular infections:
up to 800 mg q24h</td><td colspan="2">(50% of normal dose) q24h</td><td>Dose by indication;
200 – 800 mg post HD only</td><td>If usual dose is 200mg daily, use 400 daily.
If usual dose is 400mg daily, use 800 mg q24h in 1-2 divided doses
If usual dose is 800mg daily, use 1200 mg q24h (in 2 divided doses)</td></tr>
<tr><td>Foscarnet (IV)[1,2,46–48]
(Consider adjusted BW in obese)
Adj CrCl (mL/min/kg)
$\left(\frac{140 - age}{SCr \times 72}\right)$ X (0.85 if female)</td><td colspan="5"><table><tr><th>CrCl (mL/min/kg)</th><th colspan="2">CMV induction</th><th colspan="2">CMV maintenance</th><th colspan="2">HSV</th></tr><tr><td>> 1.4</td><td>60 mg/kg q8h</td><td>90 mg/kg q12h</td><td>90 mg/kg q24h</td><td>120 mg/kg q24h</td><td>40 mg/kg q12h</td><td>40 mg/kg q8h</td></tr><tr><td>> 1.0 – 1.4</td><td>45 mg/kg q8h</td><td>70 mg/kg q12h</td><td>70 mg/kg q24h</td><td>90 mg/kg q24h</td><td>30 mg/kg q12h</td><td>30 mg/kg q8h</td></tr><tr><td>> 0.8 – 1.0</td><td>50 mg/kg q12h</td><td>50 mg/kg q12h</td><td>50 mg/kg q24h</td><td>65 mg/kg q24h</td><td>20 mg/kg q12h</td><td>35 mg/kg q12h</td></tr><tr><td>> 0.6 – 0.8</td><td>40 mg/kg q12h</td><td>80 mg/kg q24h</td><td>80 mg/kg q48h</td><td>105 mg/kg q48h</td><td>35 mg/kg q24h</td><td>25 mg/kg q12h</td></tr><tr><td>> 0.5 – 0.6</td><td>60 mg/kg q24h</td><td>60 mg/kg q24h</td><td>60 mg/kg q48h</td><td>80 mg/kg q48h</td><td>25 mg/kg q24h</td><td>40 mg/kg q24h</td></tr><tr><td>≥ 0.4 – 0.5</td><td>50 mg/kg q24h</td><td>50 mg/kg q24h</td><td>50 mg/kg q48h</td><td>65 mg/kg q48h</td><td>20 mg/kg q24h</td><td>35 mg/kg q24h</td></tr><tr><td>< 0.4</td><td colspan="2">Not recommended</td><td colspan="2">Not recommended</td><td colspan="2">Not recommended</td></tr><tr><td>IHD</td><td colspan="2">60 – 90 mg/kg loading dose, then 45 – 60 mg/kg/dose post-HD only</td><td colspan="2">No data</td><td colspan="2">No data</td></tr><tr><td>CRRT</td><td colspan="6">No data</td></tr></table></td></tr>
<tr><td>Ganciclovir (IV)[1,2]
(Consider adjusted BW in obese)</td><td colspan="3"><table><tr><th>CMV</th><th>CrCl >70*</th><th>CrCl >50</th><th>CrCl >25</th><th>CrCl >10</th><th>CrCl <10</th></tr><tr><td>Induction (I)</td><td>5 mg/kg q12h</td><td>2.5 mg/kg q12h</td><td>2.5 mg/kg q24h</td><td>1.25 mg/kg q24h</td><td>1.25 mg/kg 3x/week</td></tr><tr><td>Maintenance (M)</td><td>5 mg/kg q24h</td><td>2.5 mg/kg q24h</td><td>1.25 mg/kg q24h</td><td>0.625 mg/kg q24h</td><td>0.625 mg/kg 3x/week</td></tr></table>*Manufacturer's CrCl cutoffs. Please refer to BMT protocols if applicable</td><td>I: 1.25 mg/kg post HD only
M: 0.625 mg/kg post HD only</td><td>I: 2.5 mg/kg q12–24h
M: 1.25 – 2.5 mg/kg q24h</td></tr>
<tr><td>Gentamicin[1,3,49]
(Use adjusted BW in obese)
See appendix for complete guidelines</td><td colspan="5"><table><tr><th></th><th>CrCl > 60</th><th>CrCl 40 – 59</th><th>CrCl 20 – 39</th><th>CrCl < 20</th><th>IHD</th><th>CRRT</th></tr><tr><td>Gram negative</td><td>1.7 mg/kg q8h
or
5 – 7 mg/kg q24h
(high-dose extended-interval)</td><td>1.7 mg/kg q12h
or
5 – 7 mg/kg q36h
(high-dose extended-interval)</td><td>1.7 mg/kg q24h
or
CrCl > 30: 5 – 7 mg/kg q48h
CrCl < 30: Not recommended
(high-dose extended-interval)</td><td>2 mg/kg loading dose, then per level</td><td>2 mg/kg loading dose, then 1.5 mg/kg post HD</td><td>1.5 – 2.5 mg/kg q24–48h</td></tr><tr><td>Gram positive synergy</td><td>1 mg/kg q8h**</td><td>1 mg/kg q12h</td><td>1 mg/kg q24h</td><td>1 mg/kg load, then by level</td><td>1 mg/kg q48–72h; consider redosing when level < 1 mcg/L</td><td>1 mg/kg q24h, then per level</td></tr></table>Goal levels: Gram-negative infections: Goal peak for traditional dosing 4 – 8 mcg/mL; goal trough < 1 – 2 mcg/mL
Gram-positive synergy: Goal peak 3 – 4 mcg/mL; goal trough < 1 mcg/mL
Timing of levels: Draw peak 30 minutes after completion of 3rd dose. Draw trough 30 minutes prior to 4th dose (For CrCl < 20 mL/min, may check levels sooner than 3rd/4th dose)
For 7 mg/kg once-daily dosing, draw a single random level 8 – 12 hours after dose administration. Adjust based on Hartford nomogram
For HD, draw trough pre-HD (alternative: draw trough level 4-hr post-HD); and peak 30 minutes after end of each infusion
** Streptococci, Streptococcus gallolyticus (bovis), Streptococcus viridans endocarditis: optional dosing 3 mg/kg q24h for CrCl > 60 mL/min
** Staphylococci; Enterococcus spp (strains susceptible to PCN and gentamicin) endocarditis: optional dosing 3 mg/kg in 2 or 3 equally divided doses</td></tr>
<tr><td>Imipenem/Cilastatin (IV)[1]
(SHC Restriction)</td><td colspan="3"><table><tr><th></th><th>CrCL >60</th><th>CrCL 30 – 59</th><th>CrCL 15 – 29</th><th>CrCL < 10</th></tr><tr><td>General</td><td>500 mg q6H or 1g q8h</td><td>500 mg q8h</td><td>500 mg q12h</td><td rowspan="2">Not recommended unless dialysis initiated within 48-hrs</td></tr><tr><td>NTM</td><td>1,000 mg q12H</td><td>750 mg q12H</td><td>500 mg q12H</td></tr></table></td><td>250 – 500 mg q12h</td><td>1g load, then 500 mg q6h</td></tr>
<tr><td>Isavuconazole (IV/PO)[1,2]</td><td>Initial: 372 mg q8h x 6 doses
Maintenance: 372 mg q24h</td><td>No change</td><td>No change</td><td>No change</td><td>No change</td></tr>
<tr><td>Isoniazid (PO)[1,2,43,44]</td><td>300 mg q24h
(5 mg/kg/day)</td><td>No change</td><td>No change</td><td>No change</td><td>No change</td></tr>
<tr><td>Levofloxacin (IV/PO)[1–4]</td><td colspan="3"><table><tr><th></th><th>CrCl ≥ 50</th><th>CrCl 20 – 49</th><th>CrCl < 20</th></tr><tr><td>General</td><td>250 – 500 mg q24h</td><td>250 mg q24h
- or -
500 mg q48h</td><td>500 mg x1, then 250 mg q48h</td></tr><tr><td>Severe/PNA/ Pseudomonas/ Stenotrophomonas:</td><td>750 mg q24h</td><td>750 mg q48h</td><td>750 mg x1, then 500 mg q48h</td></tr></table></td><td>See CrCl < 20 ml/min
Dose q48h, but after HD on HD days</td><td>750 mg load, then 250 – 500 mg q24h</td></tr>
<tr><td>Linezolid (IV/PO)[1,2]
(SHC Restriction)</td><td>600 mg q12h</td><td>No change</td><td>No change</td><td>No change</td><td>No change</td></tr>
</table>

<table>
<tr><th>Drug</th><th>CrCl > 50 mL/min</th><th>CrCl 10 – 50 mL/min</th><th>CrCl < 10 mL/min</th><th>Intermittent Hemodialysis (IHD)</th><th>CRRT</th></tr>
<tr><td>Meropenem[1–4,50]
(SHC Restriction)
3-hr extended infusion</td><td colspan="3"><table><tr><td></td><td>CrCl > 50</td><td>CrCl 26 – 50</td><td>CrCl 10 – 25</td><td>CrCl < 10</td></tr><tr><td>Usual dose (FN, PNA, Pseudomonas)</td><td colspan="2">1 g q8h</td><td>1 g q12h</td><td>0.5 g q12h</td><td>0.5 g q24h</td></tr><tr><td>CF/Meningitis</td><td colspan="2">2 g q8h</td><td>2 g q12h</td><td>1 g q12h</td><td>1 g q24h</td></tr></table></td><td>500 mg q24h
CF/CNS: 1 g q24h
Dose daily, but after HD on HD days</td><td>1 g q8h
CF/CNS: 2 g q12h</td></tr>
<tr><td>Metronidazole (IV/PO)[1,2]</td><td>500 mg q6–8h</td><td colspan="2">No change
Severe hepatic impairment: can consider 500 mg q12h</td><td>500 mg q8h</td><td>500 mg q6–8h</td></tr>
<tr><td>Moxifloxacin (IV/PO)[1,2]</td><td>400 mg IV/PO q24h</td><td>No change</td><td>No change</td><td>No change</td><td>No change</td></tr>
<tr><td>Nafcillin[1,2]</td><td>2 g q4h
Mild infections: 1 g q4h</td><td colspan="4">No change for renal impairment.
Hepatic Impairment: No specific dose adjustment provided by manufacturer. Dosage adjustment may be necessary in the setting of concomitant renal impairment; nafcillin primarily undergoes hepatic metabolism.</td></tr>
<tr><td>Oseltamivir (PO)[1,2,51]</td><td colspan="3"><table><tr><td></td><td>CrCl ≥ 60</td><td>CrCl 30 – 60</td><td>CrCl 10 – 30</td></tr><tr><td>Prophylaxis</td><td>75 mg q24h</td><td>30 mg q24h</td><td>30 mg q48h</td></tr><tr><td>Treatment</td><td>75 mg q12h</td><td>30 mg q12h</td><td>30 mg q24h</td></tr></table></td><td>Prophylaxis:
30 mg x 1, then 30 mg after every other HD session
Treatment:
30 mg x 1, then 30 mg post-HD only</td><td>Prophylaxis: 75 mg q24h
Treatment: 75 mg q12h</td></tr>
<tr><td>Penicillin G (IV)[1–3,5]</td><td>2 – 4 mu q4h
Dose range: 12 – 24 million units/day continuous infusion or in divided doses every 4 to 6 hours</td><td>2 – 3 mu q4h</td><td>1 – 2 mu q6h</td><td>Mild: 0.5 – 1 mu q4–6h; or 1 – 2 mu q8–12h
Severe: 2 mu q4–6h; or 4 mu q8–12h</td><td>4 mu q4–6h</td></tr>
<tr><td>Piperacillin/tazobactam[1–4,52,53]</td><td colspan="3"><table><tr><td></td><td>CrCl > 40</td><td>CrCl 20 – 40</td><td>CrCl < 20</td></tr><tr><td colspan="4">Intermittent Dosing</td></tr><tr><td>General</td><td>3.375 g q6h</td><td>2.25 g q6h</td><td>2.25 g q8h</td></tr><tr><td>Severe/sepsis/CF/ nosocomial PNA</td><td>4.5 g q6h</td><td>3.375 g q6h</td><td>2.25 g q6h</td></tr><tr><td colspan="4">Extended-Infusion Dosing (4-hr infusion)</td></tr><tr><td>General, CF Pseudomonas, nosocomial PNA:</td><td colspan="2">Extended infusion for CrCl > 20:
3.375 – 4.5 g q8h over 4h*</td><td>3.375 g q12h over 4h</td></tr></table>*In select cases, higher piperacillin/tazobactam dosing may be warranted, e.g. sepsis, critically ill patients with severe or deep-seated infections, infections with MIC > 16 mg/L, obesity with weight > 120kg or BMI > 40, CrCl > 120 mL/min, or enhanced drug clearance such as those with cystic fibrosis: consider doses of 4.5 g q8h (infused over 4 hours) or q6h.</td><td>General: 2.25 g q12h
Severe infections:
3.375 g q12h over 4-hr
alt: 2.25 g q8h</td><td>3.375 g q6h
Extended infusion:
3.375 – 4.5 g q8h over 4-hr</td></tr>
<tr><td>Polymyxin B[1,2,54,55]
(SHC Restriction)
(Use adjusted BW if obese)</td><td colspan="3">Dosing presented as units (10,000 units = 1 mg)
20,000 – 25,000 units/kg load x 1, then 12,500 – 15,000 units/kg q12h
(maximum: 25,000 units/kg/day)</td><td>No data</td><td>No change</td></tr>
<tr><td>Posaconazole (PO/IV)[1,2]
(SHC Restriction [IV])</td><td colspan="3"><table><tr><td></td><td>Oral Suspension</td><td>Delayed-release tablet / Intravenous solution</td></tr><tr><td>Prophylaxis</td><td>200 mg q8h</td><td rowspan="2">300 mg q12h x 1 day, then 300 mg q24h</td></tr><tr><td>Treatment</td><td>Usual dose: 200 mg q6–8h or 400 mg q12h</td></tr></table>No renal adjustment
Delayed-release tablet and oral suspension are not interchangeable
Posaconazole levels shown to have great degree of interpatient variability. Consider drawing a trough 4 – 7 days after initiating dose.
Please refer to Antifungal TDM Guide</td><td>No change</td><td>No change</td></tr>
<tr><td>Pyrazinamide (PO)[1,2,43,44]
(Use lean BW if obese)
(See footnote for lean BW equation)</td><td colspan="2">Usual Dose: 25 mg/kg q24h
(max dose: 2,000 mg/day)<table><tr><th>Lean body weight</th><th>Dose</th></tr><tr><td>40 – 55 kg</td><td>1,000 mg</td></tr><tr><td>56 – 75 kg</td><td>1,500 mg</td></tr><tr><td>76 – 90 kg</td><td>2,000 mg</td></tr></table></td><td>CrCl < 30:
25 mg/kg 3 times per week</td><td>25 mg/kg 3 times per week
Administer after HD only</td><td>No data</td></tr>
<tr><td>Rifampin (IV/PO)[1,2,43,44,56–58]
Capsule size: 150mg, 300mg</td><td colspan="2">TB: 600 mg q24h (≤ 45 kg: 10 mg/kg q24h)
Endocarditis: 300 mg q8h
PJI: 300 – 450 mg q12h
Vertebral Osteomyelitis: 600 mg q24h</td><td>No change</td><td>No change</td><td>No change</td></tr>
<tr><td>Tedizolid (IV/PO)[1,2,59]
(SHC Restriction)</td><td>200 mg q24h</td><td>No change</td><td>No change</td><td>No change</td><td>No change</td></tr>
<tr><td>Tobramycin[1,2,49]</td><td colspan="5">Refer to Gentamicin for dosing. See appendix for complete guidelines.</td></tr>
<tr><td>Trimethoprim (TMP)/ Sulfamethoxazole (IV/PO)[1,2,4,60]
(Dose by adjusted BW in obese)
SS = 80 mg TMP = 10 ml po soln
DS =160 mg TMP = 20ml po soln</td><td>Uncomplicated cystitis:
1 DS tab PO BID
SSTI: 1 – 2 DS tab PO BID
S. aureus (Bone/Joint):
8-10 mg/kg/day TMP in divided doses
(2 DS tabs PO BID)
Gram-negative bacteremia:
8-10 mg/kg/day TMP in divided doses
(2DS tab PO BID)
Stenotrophomonas:
10-15 mg/kg/day TMP divided q8-12h
PCP: 15 mg/kg/day TMP divided q8h (~2 DS tab TID)</td><td>CrCl 15 – 30:
Administer 50% of recommended dose</td><td>CrCl < 15:
Use is not recommended, but if needed for PCP:
5 – 8 mg/kg TMP q24h</td><td>2.5 – 5 mg/kg TMP q24h
PCP:
5 – 8 mg/kg TMP q24h
Dose daily, but after HD on HD days
alt: 5 – 15 mg/kg TMP post-HD only</td><td>5 – 10 mg/kg/day TMP divided q12h
PCP/ Stenotrophomonas:
15 mg/kg/day TMP divided q8–12h</td></tr>
</table>

<table>
<tr><th>Drug</th><th>CrCl > 50 mL/min</th><th>CrCl 10 – 50 mL/min</th><th>CrCl < 10 mL/min</th><th>Intermittent Hemodialysis (IHD)</th><th>CRRT</th></tr>
<tr><td>Valacyclovir (PO)[1,2]

Please refer to transplant protocols if applicable</td><td colspan="3"><table>
<tr><th></th><th>CrCl > 30</th><th>CrCl 10 – 30</th><th>< 10</th></tr>
<tr><td>VZV</td><td><u>CrCl >50</u>: 1 g q8h
<u>CrCl 30-50</u>: 1 g q12h</td><td>1 g q24h</td><td>500 mg q24h</td></tr>
<tr><td>Genital herpes</td><td><u>Initial episode</u>: 1 g q12h
<u>Recurrent episode</u>: 500 mg q12h</td><td><u>Initial episode</u>: 1 g q24h
<u>Recurrent</u>: 500 mg q24h</td><td><u>Initial/recurrent episode</u>: 500 mg q24h</td></tr>
<tr><td>Herpes labialis</td><td><u>CrCl >50</u>: 2 g q12h x 2 doses
<u>CrCl 30 – 50</u>: 1 g q12h x 2 doses</td><td>500 mg q12h x 2 doses</td><td>500 mg x 1 dose</td></tr>
</table></td><td>500 mg q24h
Dose daily, but after HD on HD days</td><td>No data</td></tr>
<tr><td>Valganciclovir (PO)[1,2]
Please refer to transplant protocols if applicable</td><td colspan="5"><table>
<tr><td></td><td>CrCl > 60</td><td>CrCl 40 – 59</td><td>CrCl 25 – 39</td><td>CrCl 10 – 24</td><td>CrCl < 10; IHD</td><td>CRRT</td></tr>
<tr><td>Induction (14-21 days)</td><td>900 mg q12h</td><td>450 mg q12h</td><td>450 mg q24h</td><td>450 mg q48h</td><td>200 mg 3x/week after HD only</td><td>No data</td></tr>
<tr><td>Maintenance/ prophylaxis</td><td>900 mg q24h</td><td>450 mg q24h</td><td>450 mg q48h</td><td>450 mg twice/week</td><td>100 mg 3x/week after HD only</td><td>No data</td></tr>
</table></td></tr>
<tr><td>Vancomycin (IV)[1,2,61,62]

(Use actual body weight; Excel AUC dose calculator encouraged, especially for obese.</td><td colspan="3">Consider loading dose of 20 – 35 mg/kg (max 3 g) for severe infections<table>
<tr><th>CrCl (mL/min)</th><th>Dose & Frequency</th><th>Total daily dose range</th></tr>
<tr><td>> 90</td><td>15 mg/kg q8h – 12h; use AUC calculator</td><td>30 – 45 mg/kg/day</td></tr>
<tr><td>51 – 89</td><td>10 – 20 mg/kg q12h; use AUC calculator</td><td>20 – 40 mg/kg/day</td></tr>
<tr><td>30 – 50</td><td>10 – 15 mg/kg q12h to 20 mg/kg q24h; use AUC calculator</td><td>20 – 30 mg/kg/day</td></tr>
<tr><td>10 – 29</td><td>10 – 15 mg/kg q24h to 15 mg/kg q48h</td><td>7.5 – 15 mg/kg/day</td></tr>
<tr><td>< 10 or AKI</td><td>15 mg/kg x 1, then dose by level</td><td>N/A</td></tr>
</table>Goal AUC/MIC ratio: 400-600 (most indications)
Refer to Vancomycin Guide for complete guidelines</td><td>15 – 20 mg/kg x 1,
then re-dose per algorithm

(see Appendix E of Vancomycin per Pharmacy Protocol)</td><td>20 mg/kg x 1, then
15 mg/kg q24h or given as 24h continuous infusion

Adjust to levels</td></tr>
<tr><td>Vancomycin PO[1,2,63]</td><td colspan="3">Poor systemic absorption- used for the treatment of Clostridium difficile-associated diarrhea
<u>Mild/moderate/severe</u>: 125 mg PO q6h
<u>Severe complicated (CDI-related septic shock, ileus, toxic megacolon)</u>: 500 mg PO q6h</td><td>No change</td><td>No change</td></tr>
<tr><td>Voriconazole (IV/PO)[1,2,64,65]

(Dose by adjusted BW in obese)</td><td><u>IV</u>: 6 mg/kg IV q12h x 2, then 4 mg/kg IV q12h

<u>PO</u>: 400 mg PO q12h x 2, then 200 mg PO q12h</td><td colspan="3">IV→PO conversion 1:1 (round to nearest tablet size- available in 200 mg and 50 mg tablets)
Caution with IV: accumulation of IV vehicle cyclodextrin occurs.
Consider PO if CrCl < 50 mL/min unless benefits justify risks of IV use.
Levels shown to have great degree of interpatient variability. Consider drawing a trough 4 – 7 days after new dose.
Please refer to Antifungal TDM Guide</td></tr>
</table>

Abbreviations: CAP = community acquired pneumonia; CRRT = continuous renal replacement therapy; FN = febrile neutropenia; HD = hemodialysis; LD = loading dose; MU = million units; PCP = pneumocystis jiroveci pneumonia; PNA = pneumonia; SCr = serum creatinine; TB = tuberculosis; TMP = trimethoprim; UF = ultrafiltration

CRRT dosing: doses listed are for CVVHDF and CVVHD modalities, which are the most common modes at SHC. Note that these are generally higher than doses used in CVVH.

LBW (men) = (1.10 x Weight(kg)) - 128 x (Weight^2/(100 x Height(m))^2)

LBW (women) = (1.07 x Weight(kg)) - 148 x (Weight^2/(100 x Height(m))^2)

LBW online calculator: http://www.empr.com/medical-calculators/lean-body-weight-calculator/article/170219/

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B. Gatekeeper

Stanford Antimicrobial Stewardship Safety and Sustainability Program

C. Review and Renewal Requirement

This document will be reviewed every three years and as required by change of law or practice

D. Revision/Review History

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E. Approvals

Antimicrobial Subcommittee 09/2004, 04/2007, 01/2009, 11/2010, 03/2011, 05/2012, 05/2013, 01/2014, 03/2017, 07/2019, 10/2019; 01/2020, 09/2020
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