

ANITMICROBIAL	CLCr 50—20 ml/min	CLCr 19—10 ml/min	CLCr <10 ml/min
Acyclovir 5—15 mg/kg Q8H ^{^^}	5—15 mg/kg Q12H	5—15 mg/kg Q24H	2.5mg/kg Q24H 5 mg/kg Q24H (VZV)
Acyclovir-VZV 800 mg po q4 h (5x/day)	No change	800 mg po Q8—12 H	400—800 mg po Q12H
Ampicillin 2 gm Q6H / 2 gm Q4H~	No Change	1—2 gm Q6—8H	1—2 gm Q8—12H
Amp/Sulbactam 3 gm Q6H	3 gm Q8H	1.5—3 gm Q12H	1.5 gm Q12H, or 1.5—3 gm Q24H
Amox/clavulanate 875/125 mg Q12H	No Change	875/125 mg Q24H	500/125 mg Q24
Aztreonam 1—2 gm Q6—8H	No Change	1—2 gm Load then 0.5—1 gm Q8H	1—2 gm Load then 125—500 mg Q8 H
Cefazolin 2 gm Q8H~	1 gm Q8	1—2 gm Q12H	1—2 gm Q24H
Cefepime 1—2 gm Q12H / 2 gm Q8H*	1 gm Q12H / 2 gm Q12H*	1 gm Q24H (if MIC ≤ 2) / 1 gm Q12H* otherwise	500 mg Q24H / 1 gm Q24H*
Cefixime 400 mg Q24H or 200 mg Q12H	No Change	300 mg Q24H	200 mg Q24H
Cefotetan 1—2 gm Q12H / ~	No Change	1—2 gm Q24H	1—2 gm Load then 1 mg Q 48 (or 500 mg Q12)
Cefoxitin 1—2 gm Q6H / 2 gm Q4H~	1—2 gm Q8H	1—2 gm Q12H	0.5—1 gm Q12—24H
Ceftaroline fosamil 600mg Q12H	400mg Q12H	300mg Q12H	200mg Q12H
Ceftazidime 1—2 gm Q8H	1 gm Q12H	1 gm Q24H	0.5 gm Q24H
Ceftizoxime 1—2 gm Q8H	1 gm Q12H	0.5—1 gm Q12H	0.5—1 gm Q24H
Ceftriaxone 1—2 gm Q12—24H	No Change	No Change	No Change, consider 2 gm Max/d if liver liver + renal
Cefuroxime 0.75—1.5 gm Q8H	No Change	0.75 gm Q12H	0.75 gm Q24H
Cephalexin 250—500 mg po Q6H	No Change	250—500 mg po Q8—12 H	250—500 mg po Q 12—24H
Cidofovir 5 mg/kg Q Week x2 (Induction)	Not Recommended	Not Recommended	Not Recommended
Ciprofloxacin 400 mg Q8—12H 500—750 mg po Q 12 H	No Change 500 mg po Q12H	400 mg IV Q18H 500 mg po Q12H	400 mg IV Q24H (Q18--20?) 500 mg po Q18H
Clarithromycin 250—500 mg po Q12H OR 1 gm po Q24H of XL	No Change	250 mg po Q 12H	250—500 mg q 24
Colistin (colistin base activity in mg) — load CBA (mg) = (C _{ss,avg})*2*(weight in kg)	Daily dose CBA (mg) = (C _{ss,avg})(1.5*CrCL+30) Dose q12H. Start 24H after load	Daily dose CBA (mg) = (C _{ss,avg})(1.5*CrCL+30) Dose q12H. Start 24H after load	Daily dose CBA (mg) = (C _{ss,avg})(1.5*CrCL+30) Dose q12H. Start 24H after load
Colistin (alternate) — load 9 MU, then 24H after load start 4.5 MU q12H	4.5 MU/day divided q12H	4.5 MU q48H	4.5 MU q48H
Ertapenem 1gm Q24H	500 mg Q24H Clcr < 30	500 mg Q24H	500 mg Q24H
Erythromycin 0.5—1 gm Q6H	No Change	No Change	0.5 gm Q6H
Ethambutol (E) 15—25 mg/kg Q day	No Change	15—25 mg/kg Q 36	15—25 mg/kg Q 48
Ethionamide 0.5—1 gm Q24H	No Change	No Change	No Change
Fluconazole 12 mg/kg IV load on day one, 400 mg Q 24H	200—400 mg Q 24	200 mg q 24	100—200 mg Q24H
Foscarnet~~ 60 mg/kg Q8H / 90 mg/kg Q12H (I) 90 mg/kg Q24H (M)	Complicated		
Flucytosine 25—37.5 mg/kg Q 6H	25 mg/kg Q12H	25 mg/kg mg/kg Q24H	25 mg/kg Q24—48H (adjust using Cp)
Ganciclovir (IV) 5 mg/kg Q12H induction (I) 5 mg/kg Q24H maintenance (M)	50—70=> 2.5 mg/kg Q12(I) 2.5 mg/kg Q24(M) 20—50=>2.5 mg/kg Q24H (I) 1.25 mg/kg Q24H (M)	1.25 mg/kg Q24H (I) 0.625 mg/kg Q24H (M)	1.25 mg/kg TIW (I) 0.625 mg/kg TIW (M)
Ganciclovir (PO) maintenance 1000 mg Q8H	50—70=> 1000 mg Q12H 25—50=> 1000 mg Q24H	10—25=> 500 mg Q24H	500 mg TIW
Gatifloxacin 400 mg Q24H	< 40—400 mg load then 200 mg Q24H	400 mg load then 200 mg Q24H	400 mg load then 200 mg Q24H
Imipenem 0.5 gm Q6H	500 mg Q8 OR 250 mg Q6H 20—40=> 250 mg Q6—8H	0.25—0.5 gm Q8—12H	0.25 gm Q12H
Isoniazid (H) 300 mg po q 24	No Change	No Change	150 mg in slow acetylators
Itraconazole 200 mg Q12H PO OR IV Q12H x 4 doses then Q24H	No Change	No Change (IV not recommended Cr Cl < 30 (cyclodextrin))	IV not recommended Cr Cl < 30 (cyclodextrin)
Levofloxacin 500—750 mg Q24H	500—750 mg x1, then 250—375 mg Q24H or 750 mg Q48H	500—750 mg x1, then 250 mg Q24H	500—750 mg x1, then 250—500 mg Q48H
Linezolid 600 mg Q12H + pyrimidine	No Change	No Change	No Change
Meropenem 1—2 gm Q8—12H / 2 gm Q8H (meningitis)~	1 gm Q8—12H	1 gm Q12H	0.5 Q24H
Penicillin G 1—4 MU Q4H	40—60=1—2 MU Q4 20—40=1—2 MU Q6	1 MU Q6	1 MU Q6—8H
Pentamidine 4 mg/kg/d Q24H	4 mg/kg Q24	4 mg/kg Q36H	4 mg/kg Q48H
Piperacillin 3—4 gm Q 4 H	4 gm Q6H	3—4 gm Q8H	3 gm Q8H or 3—4 gm Q12
Pip/Tazo 3.375—4.5 gm Q6H / Pseudomonas—3.375 gm Q4H	2.25—3.375 gm Q6H or 4.5 gm Q8 H	3.375 gm Q8H or 4.5 gm Q12	2.25 gm Q8H
Quinine 7.5—10 mg/kg Q8H (650 mg po Q8H)	No Change	7.5—10 mg/kg Q12H Metabolic Cl; inc binding to AAP; 3OH accumulates—dec dose by 1/3 after 3 day	7.5—10 mg/kg Q24H Metabolic Cl; inc binding to AAP; 3 OH accumulates —dec dose by ½ after 3 days
Quinupristin/Dalfopristin 7.5 mg/kg Q8—12H	No Change	No Change	No Change
Ticarcillin/Clavulanate 3.1 gm Q4—6H	2 gm Q4H OR 3.1 gm Q6H	2 gm Q8H OR 3.1 gm Q12H	2 gm Q12H
Tigecycline 100 mg x1, then 50 mg Q12H	No Change	No Change	No Change
Trimethoprim/Sulfa ** 10 mg TMP/kg/d divided Q8H	< 30 => 7.5 mg TMP/kg/d divided Q12H < 30 => PCP 12 mg TMP/kg/d divided Q12H	5 mg TMP/kg/d Q24H PCP 7.5 mg/kg TMP Q24H	3 mg TMP/kg/d Q24H PCP 5—7.5 mg/kg TMP Q 24
Trimetrexate 1.2 mg/kg Q24H/ 45 mg/m2 Q24H +Leucovorin	100%	50-100%	No Data; ? avoid
Valacyclovir	No Change	0.5—1 gm Q12—24H	500 mg Q24H

ANITMICROBIAL variable	CLCr 50—20 ml/min	CLCr 19—10 ml/min	CLCr <10 ml/min
Valganciclovir – Induction 900 mg BID x 3 wks	Normal to ¾ Dose	½ Dose	450 mg Q48H x3 wks, then 450 mg BIW
Valganciclovir – Maintenance 900 mg Q24H	40—59=> 450 mg Q24H 25—39=> 450 mg Q48H	10—24=> 450 BIW	Use ganciclovir PO dosing for CLCr < 10
Vancomycin § 1—1.5 gm Q12H (based on TBW, 15—25 mg/kg)	40—60=> 15 mg/kg Q24H 20—40=> 15 mg/kg load then 7.5 mg/kg Q24H	15 mg/kg Q48—72H	15 mg/kg Q4—7d
Voriconazole 4—6 mg/kg Q12H (6 mg/kg load)	No Change (IV NOT recommended for CLCr < 50, cyclodextran)	No Change (IV NOT recommended for CLCr < 50, cyclodextran)	No Change (IV NOT recommended for CLCr < 50, cyclodextran)

The following drugs do NOT need dosage adjustment in renal failure: amphotericin B (any formulation), atovaquone, azithromycin, caspofungin, chloramphenicol (increased bioavailability of chloramphenicol from succinate ester, target 5—20µg/mL), clindamycin, clofazamine dapsone, dicloxacillin, dirithromycin, doxycycline, linezolid, mefloquine, metronidazole, micafungin, miconazole, minocycline, moxifloxacin, nafcillin, oxacillin, primaquine, pyrimethamine, quinupristin/dalfopristin, rifampin, rifabutin, rifapentine, tigecycline

*Neutropenic Dosing. Pip/tazo 3.375 gm Q4H better than continuous infusion (CI) of 13.5 gm (PMID: 16029947). Cefepime 4 gm CI > 1 gm Q8H (2 gm Q8H not assessed, use for CNS & ESBL with ≤ 16 mg/L)

**TMP/SMX listed dosing is for GNR infections other than *Stenotrophomonas*. *Pneumocystis* treatment dose is 15 mg TMP/kg/d divided Q6-8H. *Stenotrophomonas* infection dose is 15-20 mg TMP/kg/d divided Q6H.

^Dosages are not necessarily appropriate for Endocarditis.

^^Dosages given are for parenteral therapy unless otherwise specified.

^^^Acyclovir dose is for HSV infections. VZV dose is 12.5-15 mg/kg Q8H. Infectious Disease Consultation is recommended for disseminated disease or encephalitis.

~Maximum recommended dose is 12gm per day [CID:52:917—924, doi:10.1093/cid/cir031]. Ampicillin can push to 18—24g/day

~Foscarnet hydration: 1 L NS + 10 gm mannitol, 250 mL pre-Rx, 500 mL with-Rx (over 1.5—2H), 250 mL post-Rx hydration.

~~Colistin dosing as “colistin base activity” (CBA) in mg rather than international units. For colistin base 1mg = 30,000 IU. CMS 1mg = 12,500 IU. $C_{ss,avg}$ = target blood level [AAC:55:3284, doi:10.1128/AAC.01733-10]

~~~Colistin dosing based on prior data. No PK evaluation, but validated in [CID:54:1720, 2012]

§Vancomycin continuous infusion calculation following 1g load. (g/24h) = [0.0261 x CL<sub>cr</sub> (mL/min) + 1.78] x target C<sub>ss</sub> (mg/L) X (24/1000) [IntJAntimicrobAgents:37:75, doi:10.1016/j.ijantimicag.2010.09.004]

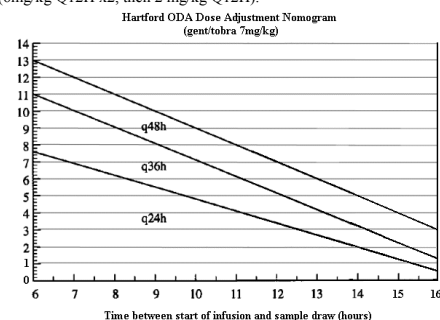
The following drugs may require dosage adjustment in hepatic failure: aztreonam (20—25% reduction +/-), carbenicillin (2g/d max ren+hep), caspofungin (35 mg Q24H moderate disease), cefepazone (max 4g/d or monitor lvl, 2g/d ren+hep), ceftriaxone (2g/d ren+hep), chloramphenicol (target 5—20µg/mL), clindamycin (+/- if severe), itraconazole (caution, 2-fold increased T½), metronidazole (+/-, target peak 10—20 µg/mL), mezlocillin (dec 50%), nafcillin (+/- if ren+hep), rimantidine (max 100mg/d), ticarcillin (2g/d if ren+hep), tigecycline (100mg load, then 25mg q12H), voriconazole (6mg/kg Q12H x2, then 2 mg/kg Q12H).

Intraperitoneal Dosing. Dose per each 2 liter exchange, IP unless otherwise noted.

Ampicillin load 250 mg, maintenance 125 mg  
Aztreonam load 1 gm, maintenance 500 mg  
Cefamandole load 1 gm, maintenance 500 mg  
Cefazolin load 1 gm, maintenance 250—500 mg  
Cefepime load 1 gm, maintenance 250 mg  
Cefoxitin load 1 gm, maintenance 200 mg  
Ceftriaxone load 1 gm, maintenance 250—500 mg  
Ciprofloxacin load 0.5 gm PO, then maintenance 50 mg IP  
Clindamycin load 300 mg, maintenance 150 mg  
Colistin 2mg/kg/d  
Fluconazole 150 mg QOD  
Flucytosine load 2 gm PO, then maintenance 1 gm PO QD  
Gentamicin load 2 mg/kg, maintenance 8-12 mg  
Nafcillin load 250 mg(?), maintenance 125 mg  
Imipenem load 1 gm, maintenance 200 mg  
Piperacillin load 4 gm IV, then maintenance 500 mg  
Vancomycin 2 gm (30 mg/kg) Q5—7 days

| ANTIMICROBIAL         | INTRATHECAL DOSING  |
|-----------------------|---------------------|
| Amikacin              | 5—7.5 mg Q24H       |
| Colistin              | 3.2—10 (20) mg Q24H |
| Gentamicin/Tobramycin | 4—8 mg Q24H         |
| Vancomycin            | 5—20 mg Q24H        |

| Aminoglycoside Dosing CVVHD/DF      | Maintenance Dosage |
|-------------------------------------|--------------------|
| Gentamicin / Tobramycin 3mg/kg load | 2 mg/kg Q24—48H    |
| Amikacin 10 mg/kg load              | 7.5 mg/kg Q24—48H  |



| ANITMICROBIAL             | HEMODIALYSIS (HD) DOSING                           | CVVH DOSING                                         | CAVHD / CVVHD / CVVHDF DOSE                         | CAPD DOSING       |
|---------------------------|----------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|-------------------|
| Acyclovir                 | Supplement 2.5mg/kg AD                             | 5—7.5 mg/kg Q24H                                    | 5—7.5 mg/kg Q24H                                    | Dose for CLCr <10 |
| Aminoglycosides           | ½ Full Dose AD & Follow Levels                     |                                                     | Follow Levels                                       | Follow Levels     |
| Ampicillin                | Dose AD                                            |                                                     | Dose for CLCr 20—50                                 | 250 mg Q12H       |
| Ampicillin/Sulbactam      | Dose AD                                            | 3 gm Q12H                                           | 3 gm Q8H                                            | 1.5-3 gm Q24H     |
| Amoxicillin/clavulanate   | Dose AD                                            |                                                     | Dose for CLCr 20—50                                 | 250/125 mg Q12H   |
| Aztreonam                 | Supplement 0.5 gm AD                               | 1—2 gm Q12H                                         | 2 gm Q12H or Dose for CLCr 20—50                    | Dose for CLCr <10 |
| Cefazolin                 | Dose AD or Supplement 1 gm AD or 20mg/kg/HD        | 1—2 gm Q12H                                         | 2 gm Q12H or Dose for CLCr 20—50                    | 0.5 gm Q12H       |
| Cefepime                  | 2 gm load, then 0.5 gm Q24H; 2 gm AD supplement    | 1—2 gm Q12H                                         | 2 gm Q12H                                           | Dose for CLCr <10 |
| Cefixime                  | Supplement 300 mg AD                               |                                                     | No Data                                             | Dose for CLCr <10 |
| Cefotetan                 | Supplement 1 gm AD                                 |                                                     | 0.75 gm Q12H                                        | Dose for CLCr <10 |
| Cefoxitin                 | Dose AD or Supplement with 1 gm AD                 |                                                     | Dose for CLCr 20—50                                 | 1 gm Q24H         |
| Ceftazidime               | Supplement 1 gm AD                                 | 1—2 gm Q12H                                         | Dose for CLCr 20—50                                 | 0.5 gm Q24H       |
| Ceftizoxime               | Supplement 1 gm AD                                 |                                                     | Dose for CLCr 20—50                                 | 0.5-1 gm Q24H     |
| Ceftriaxone               | No Change                                          | No Change                                           | No Change                                           | No Change         |
| Cefuroxime                | Dose AD                                            |                                                     | 1 gm Q12H                                           | Dose for CLCr <10 |
| Cidofovir                 | No Data                                            |                                                     | Avoid Use                                           | No Data           |
| Ciprofloxacin             | Dose for CLCr <10                                  | 200 mg Q12H                                         | 200—400 mg Q12H                                     | Dose for CLCr <10 |
| Clarithromycin            | Dose AD                                            |                                                     | Dose for CLCr <10                                   | Dose for CLCr <10 |
| Colistin                  | $C_{ss,avg}$ each 1mg/L = 30 mg/day +30% on HD day | $C_{ss,avg}$ each 1mg/L = 192 mg/day divided q8—12H | $C_{ss,avg}$ each 1mg/L = 192 mg/day divided q8—12H |                   |
| Daptomycin                | 4—6 mg/kg Q48H                                     | 4—6 mg/kg Q48H                                      | 4—8 mg Q48H                                         |                   |
| Ertapenem                 | 500mg Q24H, 150 mg AD supplement                   |                                                     |                                                     | 1 gm Q24H         |
| Erythromycin              | No Change                                          |                                                     | No Change                                           | No Change         |
| Ethambutol                | 25 mg/kg 4H before HD 3x/week                      |                                                     | Dose for CLCr 20—50                                 | Dose for CLCr <10 |
| Ethionamide               | No Change                                          |                                                     | No Change                                           | No Change         |
| Famciclovir               | Dose AD                                            |                                                     | Dose for CLCr 20—50                                 | No Data           |
| Fluconazole               | Dose AD                                            | 200—400* mg Q24H                                    | 200—800* mg Q24H                                    |                   |
| Foscarnet                 | Dose AD                                            |                                                     | Dose for CLCr 20—50                                 | Dose for CLCr <10 |
| Flucytosine               | Dose AD; usual load, then follow levels            |                                                     | Dose for CLCr 20—50                                 | 0.5—1 gm Q24H     |
| Ganciclovir               | Dose AD                                            |                                                     | Dose for CLCr 20—50                                 | Dose for CLCr <10 |
| Gatifloxacin              | Dose AD                                            |                                                     | Dose for CLCr 20—50                                 | Dose for CLCr <10 |
| Imipenem                  | Dose AD/ Not Recommended                           | 250 mg Q6H or 500 mg Q8H                            | 500 mg Q8—6H                                        | Dose for CLCr <10 |
| Itraconazole              | Dose for CLCr <10                                  |                                                     | 100 mg Q12—24H                                      | 100 mg Q12—24H    |
| Levofloxacin              |                                                    | 500 mg x1, then 250 mg Q24H                         | 500 mg x1, then 250 mg Q24H                         |                   |
| Linezolid                 | Supplement 200 mg AD                               | No Change                                           | No Change                                           | No Change         |
| Meropenem                 | Dose AD                                            | 1 gm Q12H or Dose for CLCr 20—50                    | 1 gm Q12H or Dose for CLCr 20—50                    | Dose for CLCr <10 |
| Metronidazole             | Dose AD                                            |                                                     | Dose for CLCr 20—50                                 | Dose for CLCr <10 |
| Mezlocillin               | Supplement 3—4 gm AD                               |                                                     | Dose for CLCr 20—50                                 | 3 gm Q12H         |
| Penicillin G              | Supplement 0.5 MU AD                               |                                                     | Dose for CLCr 20—50                                 | Dose for CLCr <10 |
| Pentamidine               | No Dosage Adjustment                               |                                                     |                                                     |                   |
| Piperacillin              | Supplement 1 gm AD                                 |                                                     | Dose for CLCr 20—50                                 | Dose for CLCr <10 |
| Pip/Tazo                  | Supplement 1/3 Dose AD                             | 2.25 gm Q6H                                         | 2.25—3.375 gm Q6H or Dose for CLCr 20—50            | Dose for CLCr <10 |
| Quinine                   | Dose AD                                            |                                                     | Dose for CLCr 20—50                                 | Dose for CLCr <10 |
| Quinupristin/Dalfopristin | No Dosage Adjustment                               |                                                     |                                                     |                   |
| Ticarcillin/Clavulanate   | Supplement 3.1 gm AD                               | 2 gm Q6—8H                                          | 3.1 gm Q6H or Dose for CLCr 20—50                   | Dose for CLCr <10 |
| Trimethoprim/Sulfa **     | Dose AD                                            |                                                     | No Data                                             | 0.16/0.8 gm Q48H  |
| Trimetrexate              | No Data                                            |                                                     | No Data                                             | No Data           |
| Vancomycin                | Dose for CLCr <10                                  | 15—25 mg/kg load, 1 gm Q48H, check levels           | 15—25 mg/kg load, 1 gm Q24H, check levels           | Dose for CLCr <10 |
| Voriconazole              | IV Not recommended, PO usual dose                  | 6 mg/kg Q12H x2, load, then 4 mg/kg PO Q12H         | 6 mg/kg Q12H x2, load, then 4 mg/kg PO Q12H         | Dose for HD       |

\*lower dose only if MIC ≤ 8 mg/L and not *C. krusei* or *C. glabrata*

JUNE 2002 ORIGINAL [A. Gregson]; JUNE/AUGUST 2006 Slight modifications (included updates from CID:41:1159—66, CID:40:1333—41, PMID: 12760858) [A. Gregson]; FEBRUARY 2007 (minor mod) [A. Gregson]; JANUARY 2008 (minor mod) [A. Gregson]; MARCH 2008 (updated colistin dosing RF & IT from G&G 4<sup>th</sup> Ed. 1970 p1290—1) [A. Gregson]; MARCH 2011 [A. Gregson]; March—May 2012 [A. Gregson]; January, July 2013 [A. Gregson]



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