

Guide to Choice of Antimicrobial Therapy

“Antibiogram”

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Provided by

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Tables 1 through 6 provide data to assist prescribers in the selection of empiric antimicrobial agents based on susceptibility trends at UIHC. These data can be used to predict susceptibility based on the suspected source of infection and most likely organisms.

Data reported are cumulative antimicrobial susceptibility of bacteria and yeast at UIHC from January 1 through December 31, 2010.

Duplicates and organisms with less than 30 isolates are excluded.

Table 1. Gram Negative Bacilli (number of isolates tested)	% Susceptible														
	Cefazolin	Ceftriaxone	Ampicillin	Ampicillin - Subactam	Piperacillin - Tazobactam	Cefepime	Ceftazidime	Tobramycin	Gentamicin	Meropenem	Ertapenem	Aztreonam	Trimethoprim - Sulfamethoxazole	Ciprofloxacin	Nitrofurantoin (urine only)
<i>Citrobacter freundii</i> (74)	0	93	0	0	95	100	93	91	92	100	100	95	78	92	98
<i>Citrobacter koseri</i> (44)	93	98	0	93	98	100	98	98	100	100	98	98	98	95	58
<i>Enterobacter aerogenes</i> (87)	0	87	0	0	86	100	86	99	100	100	100	87	100	98	27
<i>Enterobacter cloacae</i> (211)	0	80	0	0	84	99	83	96	96	100	99	85	91	94	23
<i>Escherichia coli</i> (2275)	87	96	59	62	97	98	96	92	92	100	100	97	78	82	98
<i>Klebsiella oxytoca</i> (131)	49	98	0	47	95	99	100	98	98	100	100	98	95	98	85
<i>Klebsiella pneumoniae</i> (533)	91	99	0	84	94	99	99	99	99	100	100	99	94	98	42
<i>Morganella morganii</i> (44)	0	93	0	23	98	100	89	89	89	100	100	100	80	77	0
<i>Proteus mirabilis</i> (241)	88	99	84	-	94	99	99	93	93	100	100	99	88	76	0
<i>Serratia marcescens</i> (98)	0	99	0	0	99	100	100	81	99	99	99	98	-	93	0
Non-Enterobacteriaceae															
<i>Acinetobacter species</i> (65)	-	83	-	95	94	92	89	92	91	97	-	-	-	85	-
<i>Pseudomonas aeruginosa</i> (679) ^a	-	-	-	-	96	92	93	94	88	94	-	84	-	82	-
<i>Stenotrophomonas maltophilia</i> (105) ^b	-	-	-	-	-	-	38	-	-	-	-	-	99	-	-
^a For serious infections caused by <i>P. aeruginosa</i> , the susceptible category for piperacillin/tazobactam implies the need for combination therapy with an aminoglycoside with <i>in vitro</i> activity against <i>P. aeruginosa</i> . High-dose or extended infusions of piperacillin/tazobactam and other beta-lactam antibiotics should also be considered. Clinical failures have been associated with aminoglycoside monotherapy. ^b <i>S. maltophilia</i> susceptibility rates for additional agents tested: 76% levofloxacin, 30% ticarcillin-clavulanic acid, 100% minocycline.															

Table 2. Streptococci, Enterococci, Gram Positive Bacilli (number of isolates tested)	% Susceptible										
	Penicillin	Ampicillin	Ceftriaxone	Vancomycin	Linezolid	Daptomycin	Gentamicin Synergy	Streptomycin Synergy	Erythromycin	Clindamycin	Nitrofurantoin (urine only)
Viridans group streptococci (114)	70/26 ^a _b	-	96	100	-	-	-	-	44	85	-
Group B strep (<i>S. agalactiae</i>) (82)	100	-	100	100	-	-	-	-	53	71	-
<i>Enterococcus</i> species (1005)	-	78	-	82	99	99	86 ^c	76 ^c	-	-	88
Aerobic diphtheroids (53)	66	-	-	100	-	-	-	-	23	-	-

^a % susceptible/ % intermediate.
^b Penicillin-intermediate viridans group strep isolates may require combination therapy with an aminoglycoside for bactericidal activity.
^c Predicts synergistic activity of the aminoglycoside with a cell-wall active agent (e.g., ampicillin, vancomycin) to which the *Enterococcus* isolate is also susceptible.

Table 3. <i>Streptococcus pneumoniae</i> (number of isolates tested)	% Susceptible							
	Penicillin (Intravenous)	Penicillin (oral)	Ceftriaxone	Vancomycin	Moxifloxacin	Erythromycin	Clindamycin	Trimethoprim-sulfamethoxazole
<i>Streptococcus pneumoniae</i> (150)	- ^a	54	- ^a	100	99	44	81	56
Meningitis (150)	54	-	78	-	-	-	-	-
Non-meningitis (150)	88	-	92	-	-	-	-	-

^a Pneumococcal breakpoints for intravenous penicillin and ceftriaxone differ based on diagnosis.

Table 4. Staphylococci (number of isolates tested)	% Susceptible							
	Penicillin	Oxacillin ^a	Vancomycin	Linezolid	Daptomycin	Erythromycin ^b	Clindamycin	Trimethoprim/ Sulfamethoxazole
<i>Staphylococcus aureus</i> (1668) ^c	0	61	100	100	99	45	71	98
Oxacillin-resistant <i>S. aureus</i> (MRSA) (649)	0	0	100	100	99	8	60	98
Oxacillin-susceptible <i>S. aureus</i> (MSSA) (1019) ^a	0	100	100	100	100	68	78	98
Coagulase negative staphylococci (CoNS) (516) ^c	0	42	100	100	-	36	-	-

^a Oxacillin susceptible staphylococci are susceptible to other penicillinase-stable penicillins (e.g., nafcillin, dicloxacillin), β -lactam/ β -lactamase inhibitor combinations, relevant cephalosporins, and carbapenems.

^b Erythromycin predicts the activity of azithromycin and clarithromycin for staphylococci.

^c Gentamicin susceptibilities (if combination therapy is desired) are; 99% MSSA, 98% MRSA, 88% CoNS

Table 5. Yeast (number of isolates tested)	% Susceptible		
	Fluconazole	Voriconazole	Caspofungin
<i>Candida albicans</i> (69)	95/2 ^a	97	100
<i>Candida glabrata</i> (57)	64/22 ^a	87/3 ^a	100

^a % susceptible / % susceptible – dose dependant

Table 6. Anaerobes (number of isolates tested)	% Susceptible				
	Clindamycin	Meropenem ^a	Metronidazole	Penicillin	Piperacillin/ Tazobactam ^b
<i>Bacteroides fragilis</i> (55)	53	95	100	0	96
<i>Peptostreptococcus</i> species ^c (47)	81	100	85	100	100
<i>Propionibacterium acnes</i> ^d (35)	97	100	0	100	100

^a Meropenem predicts the activity of ertapenem for anaerobes

^b Piperacillin-tazobactam predicts the activity of ampicillin-sulbactam for anaerobes.

^c Data for *Peptostreptococcus* species is from 2008.

^d Data for *Propionibacterium acnes* is from 2009.

Table 7 (Part 1). Select Injectable and Oral Formulary Antimicrobial Agents*

Select Injectable Formulary Antimicrobial Agents*	Commonly Used IV Daily Dose(s)**	Daily Cost [‡]	Oral Agent (% Bioavailability)	Usual Daily Oral Dose**	Daily Cost [‡]
Acyclovir	10 mg/Kg q8h	\$12	Acyclovir (15 to 30%)	800 mg 5 times/day	\$1
Amikacin	15 mg/Kg q24h***	\$7	***	***	***
Amphotericin B deoxycholate	1 mg/Kg q24h	\$12	***	***	***
Amphotericin B liposomal	5 mg/Kg q24h	\$300	***	***	***
Ampicillin	2 gm q4h	\$25	Amoxicillin (90%)	500 mg q8h	<\$1
Ampicillin/sulbactam	3 gm q6h	\$23	Amoxicillin/clavulanate (90%)	875 mg/125 mg q12h	\$1
Azithromycin	500 mg q24h	\$7	Azithromycin (40%)	500 mg daily	\$3
Aztreonam	2 gm q8h	\$70	***	***	***
Caspofungin	70 mg load, then, 50 mg q24h	\$105	***	***	***
Cefazolin	2 gm q8h	\$15	Cephalexin (well absorbed)	500 mg q6h	<\$1
Cefepime	2 gm q8h	\$22	***	***	***
Cefotaxime	2 gm q8h	\$12	Cefpodoxime (60%) Cefuroxime (40 to 50%)	200 mg q12h 500 mg q12h	\$5 \$1
Cefotetan	2 gm q12h	\$34	Cefuroxime (40 to 50%)	500 mg q12h	\$1
Cefoxitin	2 gm q6h	\$26	Cefuroxime (40 to 50%)	500 mg q12h	\$1
Ceftriaxone	2 gm q24h	\$30	Cefpodoxime (60%) Cefuroxime (40 to 50%)	200 mg q12h 500 mg q12h	\$5 \$1
Ciprofloxacin	400 mg q8h to q12h	\$10	Ciprofloxacin (80%)	750 mg q12h	<\$1
Clindamycin	900 mg q8h	\$12	Clindamycin (90%)	300 mg q6h	<\$1
Daptomycin	4 mg/Kg q24h	\$90	***	***	***
---	---	---	Doxycycline (90%)	100 mg q12h	<\$1
Ertapenem	1 gm q24h	\$58	***	***	***
Fluconazole	400 mg q24h	\$12	Fluconazole (90%)	400 mg q24h	<\$1
Ganciclovir	5 mg/Kg q12h	\$100	Valganciclovir	900 mg q12h	\$155
Gentamicin	7 mg/Kg q24h***	\$4	***	***	***

Table 7 (Part 2). Select Injectable and Oral Formulary Antimicrobial Agents*

Select Injectable Formulary Antimicrobial Agents*	Commonly Used IV Daily Dose(s)**	Daily Cost ^{††}	Oral Agent (% Bioavailability)	Usual Daily Oral Dose**	Daily Cost ‡
---	---	---	Itraconazole suspension (50%)	200 mg q12h	\$70
Linezolid	600 mg q12h	\$192	Linezolid (100%)	600 mg q12h	\$150
Meropenem	500 mg q6h	\$60	***	***	***
Metronidazole	500 mg q8h	\$4	Metronidazole (100%)	500 mg q8h	\$4
Moxifloxacin	400 mg q24h	\$12	Moxifloxacin (90%)	400 mg q24h	\$3
Nafcillin	12 gram/day (over 24 hours)	\$115	Dicloxacillin (60 to 80%)	500 mg q6h	<\$1
---	---	---	Nitrofurantoin (Macrobid®) (40%)	100 mg q12h	\$3
Penicillin G	24 million units/day	\$25	Penicillin VK (30 to 60%)	500 mg q6h	<\$1
Piperacillin	3 gm q4h	\$48	***	***	***
Piperacillin/tazobactam	3.375 gm over 4 hrs q8h	\$45	***	***	***
---	---	---	Posaconazole (variable)	800 mg/day divided	\$120
Ticarcillin/clavulanate	3.1 gm q4h	\$40	***	***	***
Tigecycline	100 mg then 50 mg q12h	\$120	***	***	***
Tobramycin	7 mg/Kg q24h***	\$6	***	***	***
Trimethoprim/Sulfamethoxazole	5 mg TMP/Kg q8h	\$10	TMP/SMX (90%)	2 double strength tablets q8h	<\$1
---	---	---	Trimethoprim (90%)	100 mg q12h	<\$1
Vancomycin	15 mg/Kg q12h***	\$12	***	***	***
---	---	---	Vancomycin oral solution (0%) ‡	125 mg q6h	\$5
Voriconazole	6 mg/Kg q12h x 2 doses, then 4 mg/Kg q12h	\$450 then \$350	Voriconazole (96%)	200 mg q12h	\$80

* See Table 9 for a more complete list of formulary antimicrobial agents.

** Doses represent those to treat serious infections. See Table 8 for renal dosing.

*** Consult Pharmacy or Infectious Diseases for patient specific recommendations.

† Inpatient acquisition cost for a 70 Kg patient. Prices do not reflect outpatient cost of antimicrobial.

‡ Oral vancomycin should only be used to treat *C. difficile*.

**Table 8 (Part 1) Guide for Dosing Injectable Antimicrobials that Require Adjustment in Adults with Renal Dysfunction*
- CEPHALOSPORINS, PENICILLINS, AMINOGLYCOSIDES, FLUOROQUINOLONES -**

Drug	Usual Starting Daily IV Dose**	Creatinine Clearance (CrCl)		
		30 to 49 mL/minute	10 to 29 mL/minute	<10 mL/minute
	(Normal renal function)			
CEPHALOSPORINS				
Cefazolin [^]	1 gm to 2 gm q8h	1 gm to 2 gm q12h	1 gm to 2 gm q12h	1 gm to 2 gm q24h
Cefepime	2 gm q8h ^Σ or 1 gm q6h	2 gm q12h or 1 gm q8h	1 gm to 2 gm q12h	1 gm to 2 gm q24h
Cefotaxime	1 gm to 2 gm q8h	1 gm to 2 gm q12h	1 gm to 2 gm q12h	1 gm q24h
Cefotetan	1 gm to 2 gm q12h	1 gm to 2 gm q12h	1 gm to 2 gm q24h	1 gm q24h
Cefoxitin	1 gm to 2 gm q8h	1 gm to 2 gm q8h	1 gm to 2 gm q12h	1 gm q24h
PENICILLINS				
Ampicillin	2 gm q4h	2 gm q6h	2 gm q6h	2 gm q12h
Ampicillin/Sulbactam	1.5 gm to 3 gm q6h	1.5 gm to 3 gm q8h	1.5 gm to 3 gm q8h	1.5 gm to 3 gm q12h
Penicillin G	12 to 24 million units infusion/24 hrs	Decrease usual dose 25%	Decrease usual dose 25%	Decrease usual dose 50%
Piperacillin	3 gm q4h	3 gm q6h	3 gm q6h	3 gm q8h
Piperacillin/Tazobactam	3.375 gm q8h (infused over 4 hrs)	3.375 gm q8h (over 4 hrs)	3.375 gm q12h (<20 ml/min, infuse over 4 hrs)	3.375 gm q12h (<20 ml/min, infuse over 4 hrs)
Ticarcillin/Clavulanate	3.1 gm q4h	2 gm q4h	2 gm q8h	2 gm q12h
AMINOGLYCOSIDES				
Amikacin	5 mg/Kg q8h or 15 mg/Kg q24h	++	++	++
Gentamicin	1 to 2 mg/Kg q8h or 7 mg/Kg q24h ^π	++	++	++
Tobramycin	1 to 2 mg/Kg q8h or 7 mg/Kg q24h ^π	++	++	++
FLUOROQUINOLONES^Υ				
Ciprofloxacin	400 mg q8h to q12h	400 mg q8h to q12h	400 mg q12h to q24h	400 mg q24h

**Table 8 (Part 2) Guide for dosing Injectable Antimicrobials that Require Adjustment in Adults with Renal Dysfunction*
- ANTIFUNGALS, ANTIVIRALS & MISCELLANEOUS -**

Drug	Usual Starting Daily IV Dose**	Creatinine Clearance (CrCl)		
		(Normal renal function)	30 to 49 mL/minute	10 to 29 mL/minute
ANTIFUNGALS				
Fluconazole	400 mg to 800 mg q24h [§]	50% of normal dose q24h	50% of normal dose q24h	50% of normal dose q24h
Voriconazole	6 mg/Kg q12h on day 1, followed by 4 mg/Kg q12h	Oral preferred instead of IV due to accumulation of cyclodextrin vehicle in the IV formulation.. For patients ≥ 40 Kg = 200 mg to 300 mg PO q12h; For patients under 40 Kg = 100 mg to 150 mg PO q12h		
ANTIVIRALS				
Acyclovir	10 mg/Kg q8h	10 mg/Kg q12h (CrCl 25 to 50 mL/min)	10 mg/Kg q24h (CrCl 10 to 24 mL/min)	5 mg/Kg q24h
Ganciclovir	5 mg/Kg q12h	2.5 mg/Kg q12h (CrCl 50 to 79 mL/min) 2.5 mg/Kg q24h (CrCl 25 to 49 mL/min)	1.25 mg/Kg q24h (CrCl 10 to 24 mL/min)	1.25 mg/Kg 3 times/week
MISCELLANEOUS				
Aztreonam	2 gm q8h	2 gm q8h	1 gm q8h	0.5 gm q8h
Colistimethate	2.5 mg to 5 mg/Kg in 2 to 4 doses/day	75% of normal dose q12h	50% of normal dose q24h	50% of normal dose q24h
Daptomycin	4 mg/Kg to 6 mg/Kg q24h [*]	4 mg/Kg to 6 mg/Kg q24h [*]	Same dose q48h	Same dose q48h
Ertapenem	1 gm q24h	1 gm q24h	500 mg q24h	500 mg q24h
Meropenem	500 mg q6h to 1 gm q8h [¶]	500 mg q6h to 1 gm q12h	500 mg q12h	500 mg q24h
Trimethoprim/Sulfamethoxazole ⁺	5 mg/Kg (TMP) q6h to q8h	See Footnote ⁺ Give full dose for first 48 hrs	See Footnote ⁺ Give full dose for first 48 hrs	See Footnote ⁺
Vancomycin	15 mg/Kg q8h to q12h; q8h dosing is preferred for patients <40 yrs old with normal renal function	15 mg/Kg q24h for SrCr 1.4 mg/dL or greater CrCl <20 ml/min give 15 mg/Kg x1 then dose by serum vancomycin levels For hemodialysis give 1 gm post-dialysis		

Table 9: UIHC Systemic Antimicrobials

<u>AMINOGLYCOSIDES</u>	<u>CEPHALOSPORINS</u>	<u>PENICILLINS</u>	<u>TETRACYCLINES</u>
Amikacin	<i>First Generation:</i>	Penicillin G benzathine	Doxycycline
Gentamicin	Cefazolin	Penicillin G potassium	Minocycline
Neomycin	Cephalexin	Penicillin G procaine	Tetracycline
Streptomycin	<i>Second Generation:</i>	Penicillin G sodium	Tigecycline (ID)
Tobramycin	Cefoxitin	Penicillin V potassium	
	Cefotetan		
	Cefuroxime	<i>Penicillinase-</i>	<u>MISCELLANEOUS</u>
<u>ANTIFUNGALS</u>	<i>Third Generation:</i>	<i>Resistant Penicillins:</i>	Atovaquone
Ampho B deoxycholate	Cefixime	Dicloxacillin	Aztreonam
Ampho B liposomal	Cefpodoxime	Nafcillin	Bacitracin
Caspofungin	Cefotaxime		Clindamycin
Fluconazole	Ceftazidime	<i>Aminopenicillins:</i>	Colistimethate (ID)
Flucytosine	Ceftriaxone	Amoxicillin	Daptomycin
Griseofulvin	<i>Fourth Generation:</i>	Amoxicillin/Clavulanate	Ertapenem
Itraconazole	Cefepime	Ampicillin	Linezolid
Nystatin		Ampicillin/Sulbactam	Meropenem
Posaconazole (ID)	<u>FLUOROQUINOLONES</u>		Metronidazole
Terbinafine	Ciprofloxacin	<i>Extended-Spectrum Penicillins:</i>	Nitazoxanide
Voriconazole	Moxifloxacin	Piperacillin	Nitrofurantoin
		Piperacillin/Tazobactam	Pentamidine
<u>ANTIVIRALS</u>	<u>MACROLIDES</u>	Ticarcillin/Clavulanate	Rifabutin
Acyclovir	Azithromycin		Rifampin
Cidofovir (ID)	Clarithromycin	<u>SULFONAMIDES</u>	Rifaximin
Foscarnet	Erythromycin	Sulfadiazine	Tinidazole
Ganciclovir		Trimethoprim/ Sulfamethoxazole	Trimethoprim
Osetamivir			Vancomycin
Valacyclovir			
Valganciclovir			
Zanamivir			

Medications for treatment of HIV, hepatitis, and mycobacterium are not included on this list – see the UIHC Formulary and Handbook

For additional information regarding available dosage forms, please consult: 1) *UIHC Formulary and Handbook* at <http://www.formularyproductions.com/uihc/>; or 2) call the Drug Information Service at 6-2600.

ID = Restricted to Infectious Diseases approval; please contact the ID staff physician on-call [pager 3229 (adults) or 3333 (pediatrics)] for approval of use.

Footnotes for Table 8

<p>* Azithromycin, amphotericin B, caspofungin, ceftriaxone, clindamycin, doxycycline, linezolid, metronidazole, moxifloxacin, nafcillin, posaconazole, and tigecycline do not require adjustments for renal dysfunction.</p>	<p>‡ Moxifloxacin is recommended for community-acquired respiratory infections; ciprofloxacin is recommended for gram-negative infections.</p>
<p>** Dosage for moderate to severe infections; higher doses may be required for life threatening infections; lower doses may be utilized for UTI.</p>	<p>* 6 mg/Kg for endocarditis and osteomyelitis; 4 mg/Kg for skin/soft tissue infection.</p>
<p>++ Initial dosing only; consult Pharmacy for dosage adjustments and serum level recommendations.</p>	<p>+ After first 48 hours; for CrCl 15 to 30 mL/min give half usual dose q24h, for CrCl < 15 mL/min give usual dose q48h. For hemodialysis only dose after HD.</p>
<p>§ 800 mg may be required in specific cases (e.g., <i>Candida glabrata</i>)</p>	<p>‡ Give dose after hemodialysis.</p>
<p>▲ Cefazolin 2 gm is recommended for patients ≥80 Kg.</p>	<p>¶ Higher dose (2 gm q8h) may be needed for CNS infections.</p>
<p>π 7 mg/Kg doses are recommended for gram-negative infections (e.g., pneumonia, sepsis).</p>	<p>Σ 2 gm q8h for CNS infections and febrile neutropenia.</p>

UIHC Criteria Based Antimicrobial Agents

Drug	Criteria For Use
Anti-bacterial Agents	
Aztreonam	<ol style="list-style-type: none"> 1. Documented or suspected gram-negative infection and history of beta-lactam allergy. 2. Recommended by Infectious Diseases. <p>Note: Consider formal consultation with the Infectious Diseases Service for selection of alternate antibiotic therapy or Allergy/Immunology for allergy testing.</p>
Ceftazidime	<ol style="list-style-type: none"> 1. Documented <i>Pseudomonas aeruginosa</i> infection. <p>Note: The first line agent is cefepime.</p>
Colistimethate	<ol style="list-style-type: none"> 1. Recommended by Infectious Diseases.
Daptomycin	<ol style="list-style-type: none"> 1. Recommendation by Infectious Diseases. 2. Documented or suspected vancomycin resistant enterococci (VRE) infection. 3. Documented methicillin-resistant Staphylococcus aureus (MRSA) infection refractory to vancomycin. 4. Documented methicillin-resistant Staphylococcus aureus (MRSA) infection and allergy/intolerance to vancomycin. <p>NOTE: Daptomycin should NOT be used to treat pneumonia as daptomycin interacts with pulmonary surfactant resulting in inhibition of antibacterial activity. Monitoring of creatinine phosphokinase (CPK) levels is necessary and should occur at least once per week. More frequent monitoring is required for patients with prior or concomitant therapy with an HMG-CoA reductase inhibitor ("statins"). Consider temporarily discontinuing HMG-CoA reductase inhibitor therapy.</p>
Linezolid	<ol style="list-style-type: none"> 1. Recommended by Infectious Diseases 2. Documented or suspected vancomycin resistant enterococci (VRE) infection. 3. Documented methicillin-resistant Staphylococcus aureus (MRSA) infection refractory to vancomycin 4. Documented methicillin-resistant Staphylococcus aureus (MRSA) infection and allergy/intolerance to vancomycin.
Meropenem	<ol style="list-style-type: none"> 1. Recommendation by ID Service. 2. MDR gram (-) infection with organisms resistant to all other antibiotics 3. Neutropenic fever in a patient who has not responded to or who is intolerant to first line agents (see note). 4. Recent exposure to first line agents (within 30 days) in a critically ill patient while awaiting susceptibility results. 5. History of infection with MDR gram (-) organism (e.g., ESBL-producing organism) 6. Severe pancreatitis with CT proven necrosis or culture evidence of infection <p>NOTE: Meropenem therapy should always be adjusted to a more narrow therapy once susceptibility results are available. First line agents for neutropenic fever: cefepime or piperacillin/tazobactam.</p>

UIHC Criteria Based Antimicrobial Agents

Moxifloxacin	<ol style="list-style-type: none"> 1. Community-acquired pneumonia and oral therapy is not appropriate. 2. Recommended by Infectious Diseases.
Quinupristin/dalfopristin	<ol style="list-style-type: none"> 1. Recommended by Infectious Diseases.
Ticarcillin/clavulanate	<ol style="list-style-type: none"> 1. Documented <i>Pseudomonas aeruginosa</i> infection in a patient with cystic fibrosis and susceptibility testing shows resistance to preferred antimicrobial agents. 2. Serious infection due to <i>Stenotrophomonas maltophilia</i> with documented susceptibility to ticarcillin/clavulanate. <p>NOTE: Dosing based on ticarcillin component <i>Stenotrophomonas maltophilia</i> has intrinsic resistance to many commonly used antimicrobials and risk for emergence of resistance during therapy is substantial. Combination therapy should be considered for all serious infections due to this organism.</p>
Tigecycline	<ol style="list-style-type: none"> 1. Recommendation by Infectious Diseases.
Antifungal Agents	
Caspofungin	<ol style="list-style-type: none"> 1. Recommended by Infectious Diseases 2. Documented or suspected Candidemia AND fluconazole is not advised (see notes). 3. Febrile neutropenia AND can not use amphotericin B or voriconazole. <p>NOTE: Fluconazole is NOT advised as empiric therapy in a patient with recent exposure (\leq 3 months) to fluconazole, known colonization with fluconazole-resistant organism (<i>C. glabrata</i>, <i>C. krusei</i>) or in the event of clinical failure or drug toxicity associated with fluconazole use. Fluconazole is preferred therapy for <i>Candida parapsilosis</i>.</p>
Posaconazole	<ol style="list-style-type: none"> 1. Recommended by Infectious Diseases. 2. Prophylaxis in high-risk BMT patient.
Voriconazole	<ol style="list-style-type: none"> 1. Recommended by Infectious Diseases. 2. Documented or suspected invasive aspergillosis. 3. Documented or suspected invasive mold infection. 4. Prophylaxis according to approved protocols.
Antiviral Agents	
Cidofovir	<ol style="list-style-type: none"> 1. Recommended by Infectious Diseases.