

# Antimicrobial Testing

## Antimicrobial Level Testing Guidelines

Average or Range of Peak Serum Concentrations (mcg/mL)

*Focus performs drug level testing on the antimicrobial agents listed below.*

*Refer to the Directory of Laboratory Services for specific information.*

Test Method	Dose/Route	Peak Serum Level (mcg/mL)	Test Method	Dose/Route	Peak Serum Level (mcg/mL)
<b>Antibacterial Agents</b>			<b>Antifungal Agents</b>		
Amoxicillin . . . . . BA	250 mg PO	3.5-5	Amphotericin B . . . HPLC	<i>non-liposomal:</i> 0.4-0.7 mg/kg IV	0.5-3.5
Ampicillin . . . . . BA	500 mg PO 2 g IV	3-6 47		<i>liposomal:</i> 2.5 mg/kg IV 5.0 mg/kg IV	13-49 48-118
Azithromycin . . . . . BA	500 mg PO 500 mg IV	0.4 2.0-5.2	Fluconazole . . . . . HPLC	400 mg PO (1st dose) 400 mg (Steady State)	4.1-8.1 20-30
Aztreonam . . . . . BA	1g IV	90-160	5-Fluorocytosine . . BA	2g PO	30-45
Cefazolin . . . . . BA	1g IV	188	Itraconazole . . . . . HPLC	200 mg PO 2x/d	1.9-2.2
Cefotaxime . . . . . BA	1g IV	20.5	Ketoconazole . . . . . BA	200 mg PO	4
Cefoxitin . . . . . BA	1g IV	110	Posaconazole . . . . . HPLC	200 mg PO	0.05-0.27
Ceftazidime . . . . . BA	1g IV	60	Voriconazole . . . . . HPLC	200 mg PO 4 mg/kg IV	2-6
Ceftriaxone . . . . . BA	1g IV	150			
Cefuroxime . . . . . BA	1.5g IV	100			
Cephalexin . . . . . BA	250 mg 50 mg 1 g	9 18 32			
Chloramphenicol . . . HPLC	1g PO	10-25	<b>Antimycobacterial Agents</b>		
Ciprofloxacin . . . . . BA	750 mg PO 400 mg IV	3.6 4.1-4.6	Azithromycin . . . . . BA	500 mg PO	0.4
Clarithromycin . . . . . BA	500 mg PO	3-4	Capreomycin . . . . . HPLC	1g IM	20-47
Clindamycin . . . . . BA	150 mg PO 600 mg IV	2.5 10	Clarithromycin . . . . . BA	500 mg PO	2-3
Dicloxacillin . . . . . BA	500 mg PO	7-18	Cycloserine . . . . . HPLC	250 mg PO	8-20
Doxycycline . . . . . BA	100 mg PO 200 mg IV	1.5-2.1 4-10	Isoniazid . . . . . HPLC	7 mg/kg PO	1-4.5
Erythromycin . . . . . BA	500 mg PO	0.1-2	Kanamycin . . . . . BA	500 mg IM	15-30
Imipenem . . . . . BA	500 mg IV	40-55	Pyrazinamide . . . . . HPLC	20 mg/kg PO	30-50
Kanamycin . . . . . BA	500 mg IM	15-30	Rifabutin . . . . . BA	300 mg PO	0.375
Levofloxacin . . . . . BA	500 mg PO 500 mg IV	5.7 6.4	Rifampin . . . . . HPLC	600 mg PO	4.0-32
Metronidazole . . . . . BA	500 mg PO	11.5-13	Streptomycin . . . . . HPLC	1g IV	25-50 (Mtb)
Minocycline . . . . . BA	200 mg PO	2.0-3.5			
Moxifloxacin . . . . . BA	400 mg PO/IV	2.1-8.8	<b>Antiretroviral Agents</b>		
Nafcillin . . . . . BA	1g PO 500 mg IV	7.7 40-57	Amprenavir . . . . . HPLC	1200 mg PO	5.4
Neomycin . . . . . BA	4g PO	6-12	Delavirdine . . . . . HPLC	400 mg PO	19.0±11.0
Oxacillin . . . . . BA	500 mg PO 500 mg IV	2.6-3.9 40-57	Indinavir . . . . . HPLC	800 mg PO	6.0-12.0
Penicillin G . . . . . BA	12 million Units IV	20	Nelfinavir . . . . . HPLC	750 mg PO	3.0-4.0
Piperacillin . . . . . BA	4g IV	390-480	Nevirapine . . . . . HPLC	200 mg PO q12h	1.6-2.4
Rifampin . . . . . HPLC	600 mg PO	7	Saquinavir . . . . . HPLC	1200 mg PO (soft gel)	0.5-2.0
Streptomycin . . . . . HPLC	1g IV	5-25	Kaletra® . . . . . HPLC	400 mg lopinavir PO	5.5±4 (Steady State)
Sulfamethoxazole . . SP	2g PO	50-120		100 mg ritonavir PO	5-7% lopinavir level
Tetracycline . . . . . BA	250 mg PO	1.5-2.2			
Ticarcillin . . . . . BA	3g IV	260			
Ticarcillin/ Clavulanate . . . . . BA	3g IV	324	<b>Antiviral Agents</b>		
Trimethoprim . . . . . BA	100 mg PO	1	Acydovir . . . . . HPLC	200 mg PO 5 mg/kg IV	0.83 9.8
Trimethoprim/ Sulfamethoxazole . . BA	160/800 mg PO	40-60	Ganciclovir . . . . . HPLC	1g PO 5 mg/kg IV	1.2 8.3

Methods: BA = Bioassay HPLC = High Performance Liquid Chromatography SP = Spectrophotometry

## Antimicrobial Susceptibility Testing

The following drugs are available for Antimicrobial Susceptibility MIC\* Testing:

<b>Antibacterial</b>	Ceftizoxime	Linezolid	Rifampin	5-Fluorocytosine	Imipenem
Amikacin	Ceftriaxone	Lomefloxacin	Streptomycin	Griseofulvin	Isoniazid
Amoxicillin	Cefuroxime	Meropenem	Sulfamethoxazole	Itraconazole	Kanamycin
Amoxicillin/ Clavulanate	Cephalexin	Metronidazole	Sulfisoxazole	Ketoconazole	Linezolid
Ampicillin	Cephalothin	Minocycline	Tetracycline	Miconazole	Minocycline
Ampicillin/ Sulbactam	Chloramphenicol	Moxifloxacin	Ticarcillin	Natamycin	p-Aminosalicylic acid
Azithromycin	Ciprofloxacin	Mupirocin	Ticarcillin/ Clavulanate	Nystatin	Pyrazinamide
Aztreonom	Clarithromycin	Nafcillin	Tigecycline	Posaconazole	Rifabutin
Bacitracin	Clindamycin	Nalidixic Acid	Tobramycin	Terbinafine	Rifampin (Rifampicin)
Carbenicillin	Colistin	Neomycin	Trimethoprim	Terconazole	Streptomycin
Cefaclor	Daptomycin	Nitrofurantoin	Trimethoprim/ Sulfamethoxazole	Voriconazole	Tobramycin
Cefazolin	Dicloxacillin	Norfloxacin	Vancomycin	<b>Antimycobacterial</b>	Trimethoprim/ Sulfamethoxazole
Cefepime	Doripenem	Ofloxacin		Amikacin	
Cefixime	Doxycycline	Oxacillin		Capreomycin	<b>Antiviral</b>
Cefotaxime	Ertapenem	Penicillin	<b>Antifungal</b>	Cefoxitin	Acyclovir
Ceftazidime	Erythromycin	Piperacillin	Amphotericin B	Ciprofloxacin	Foscarnet
Cefoxitin	Fosfomycin	Piperacillin/ Tazobactam	Butoconazole	Clarithromycin	Ganciclovir
Cefpodoxime	Gemifloxacin	Polymyxin B	Caspofungin	Cycloserine	
Cefprozil	Imipenem	Quinupristin/ Dalfopristin	Clotrimazole	Ethambutol	
	Kanamycin		Fluconazole	Ethionamide	
	Levofloxacin				

\*MBC testing is available for selected drugs.

### Drug Resistance by Mutation Analysis

Molecular techniques are used to determine point mutations that are known to be responsible for drug resistance patterns in specific organisms. Focus Diagnostics performs testing for the following:

- ▶ Cytomegalovirus (CMV) Genotyping
- ▶ Hepatitis B Virus (HBV) Genotyping
- ▶ HIV Genotyping

Drug resistance genotyping is performed at Quest Diagnostics Nichols Institute.

### REFERENCES

1. Gilbert, D.N., Moellering, R.C., Eliopoulos, G.M., Sande, MA. *The Sanford Guide to Antimicrobial Therapy*. 2004.
2. Lorian, V. *Antibiotics in Laboratory Medicine*, Williams & Williams. 1996.
3. Mandel, GL, Bennett, JE, Dolin, R. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases*. Churchill Livingstone, 2005.
4. Yu, V.L., Merigan, T.C., Barriere, S.L. *Antimicrobial Therapy and Vaccines*, Williams & Williams. 1999.