

2012 ANTIBIOGRAM

Central Zone – Former DTHR Sites

Department of Pathology and Laboratory Medicine



Medically Relevant Pathogens Based on Gram Morphology

Gram-negative Bacilli		
Lactose Fermenters	Non-lactose Fermenters	Glucose Non-fermenters
<i>Escherichia coli</i>	<i>Serratia marcescens</i>	<i>Pseudomonas aeruginosa</i>
<i>Klebsiella pneumoniae</i>	<i>Salmonella</i> spp.	<i>Pseudomonas</i> spp.
<i>Klebsiella oxytoca</i>	<i>Proteus</i> spp.	<i>Stenotrophomonas maltophilia</i>
<i>Enterobacter cloacae</i>	<i>Morganella morganii</i>	<i>Acinetobacter baumannii</i> complex
<i>Citrobacter freundii</i> complex	<i>Aeromonas</i> spp.	<i>Achromobacter</i> species
<i>Enterobacter aerogenes</i>	<i>Providencia</i> spp.	<i>Burkholderia cepacia</i>
<i>Citrobacter koseri</i>	<i>Yersinia</i> spp.	<i>Chryseobacterium</i> species

Gram-positive Cocci	
Gram-positive Cocci in Chains	Gram-positive Cocci in Clumps
<i>Enterococcus faecium</i> , <i>Enterococcus faecalis</i>	<i>Staphylococcus aureus</i>
<i>Streptococcus pyogenes</i> (Group A)	<i>Staphylococcus</i> spp., coagulase-negative
<i>Streptococcus agalactiae</i> (Group B)	<i>Staphylococcus lugdunensis</i>
<i>Streptococcus pneumoniae</i>	<i>Micrococcus</i> spp.
Viridans group streptococci	<i>Aerococcus</i> spp.
<i>Streptococcus anginosus</i> group	<i>Rothia mucilagenosus</i>

Abbreviation Glossary for Antimicrobials

Antimicrobial	Abbreviation	Antimicrobial	Abbreviation
Amikacin	AMK	Gentamicin	GEN
Ampicillin	AMP	Imipenem	IMI
Amoxicillin/clavulanate	A/C	Meropenem	MERO
Cefazolin	FAZ	Nitrofurantoin	NIT
Ceftriaxone	CRO	Piperacillin	PIP
Ceftazidime	CAZ	Piperacillin-tazobactam	P/T
Cefuroxime	CXM	Tetracycline	TET
Ciprofloxacin	CIP	Tobramycin	TOB
Clindamycin	CLIN	Trimethoprim-sulfamethoxazole	SXT
Cloxacillin	CLOX	Vancomycin	VAN
Erythromycin	ERY		

2012 ANTIBIOGRAM TABLES

Gram Positive Organisms – Percent Isolates Susceptible

Pathogen	No. Tested	AMP	CLOX	CRO	ERY	CLIN	GEN	NIT ^a	TET	SXT	VAN
<i>Staphylococcus aureus</i> (MSSA)	1915	-	100	-	76	82	-	99	97	99	100
<i>Staphylococcus aureus</i> (MRSA)	1010	-	0	-	18	34	-	99	97	99	100
<i>Enterococcus spp.</i>	2692	97	-	-	-	-	71 ^b	97	-	-	99
<i>Streptococcus pneumoniae</i>	82	-	-	96	78	-	-	-	-	86	100

Gram Negative Enterobacteriaceae – Percent Isolates Susceptible

Pathogen	No. Tested	AMP	A/C	P/T	FAZ	CXM	CRO	MERO	CIP	GEN	NIT ^a	SXT
<i>Escherichia coli</i>	11415	61	-	98	-	96	99	100	83	94	96	80
<i>Escherichia coli</i> ESBL	523	0	0	91	0	0	0	100	14	71	82	38
<i>Klebsiella pneumoniae</i>	1295	0	98	98	-	95	100	100	97	99	45	95
<i>Klebsiella oxytoca</i>	327	0	97	97	-	93	98	100	98	100	84	98
<i>Citrobacter freundii</i>	204	0	0	96	0	0	89	100	88	97	92	81
<i>Enterobacter aerogenes</i>	103	0	0	92	0	0	89	100	99	97	12	90
<i>Enterobacter cloacae</i>	293	0	0	88	0	0	85	100	96	100	27	94
<i>Morganella morganii</i>	63	0	0	100	0	0	97	100	83	83	0	75
<i>Proteus mirabilis</i>	498	79	-	100	-	95	98	100	89	97	0	86
<i>Serratia marcescens</i>	65	0	0	97	0	0	100	100	94	98	0	98

Gram Negative Non-Enterobacteriaceae – Percent Isolates Susceptible

Pathogen	No. Tested	PIP	CAZ	IMI	MERO	CIP	GEN	TOB	AMK	SXT
<i>Pseudomonas aeruginosa</i>	803	93	90	91	90	80	88	98	96	-

-, not available; this susceptibility data is not reported either because testing is not indicated or therapy is not appropriate

^a, for urinary tract infections only

^b, reflects aminoglycoside synergistic activity when used in combination with a beta-lactam or glycopeptides antibiotic.

HIGHLIGHTS OF THE ANTIBIOGRAM

1. *S. aureus* (MSSA) susceptibility rates have not changed from 2007. Cloxacillin and first generation cephalosporins (cefazolin) remain the drugs of choice for the treatment of non-life-threatening *S. aureus* infections. MRSA strains may be referred to as 'community-associated' (CA) or 'hospital-associated' (HA). CA-MRSA tend to be more predictably susceptible to clindamycin and SXT than HA-MRSA.
2. Vancomycin remains highly active against *S. aureus* and coagulase-negative staphylococci.
3. *S. pneumoniae* resistance to the macrolides has been steadily increasing for the past decade and reached ~25% nationally in 2007. Penicillin G is the treatment of choice for susceptible non-CSF infections. No vancomycin resistance has been detected to date in *S. pneumoniae* and quinolone resistance is rare.
4. Resistance rates in clinically relevant enterococci have not changed significantly since 2005. Ampicillin +/- gentamicin is the treatment of choice for systemic infections of *E. faecalis* (for UTI's, nitrofurantoin is effective). Substitution of one aminoglycoside for another cannot be assumed and synergy testing must be completed. Periodic hospital outbreaks of vancomycin resistant enterococcus (VRE) increase the risk of serious infections with resistant enterococci. Identification of enterococci to the species level is only performed for sterile site isolates.
5. *E. coli* resistance rates to ciprofloxacin (17%) and SXT (20%) are significant. For patients with *E. coli* urinary tract infections and creatinine clearance more than 60 mL/min, consider using nitrofurantoin. The extended-spectrum β -lactamase (ESBL) resistance phenotype confers resistance to all third-generation cephalosporins and, in some cases, piperacillin-tazobactam. A significant proportion of ESBL-positive *E. coli* are also resistant to the quinolones, aminoglycosides, and SXT.
6. *Enterobacter*, *Citrobacter*, and *Serratia* species may develop resistance to all β -lactams except for imipenem and meropenem during prolonged β -lactam therapy. These pathogens are also intrinsically resistant to ampicillin, cefazolin, and cefuroxime.
7. For non-urinary tract pseudomonal infections combination therapy is recommended. Ceftazidime or piperacillin/tazobactam PLUS ciprofloxacin or aminoglycoside are drugs of choice. Tobramycin has documented higher activity than gentamicin against *Pseudomonas*.