2011 ANTIBIOGRAM

Central Zone – Former DTHR Sites

Department of Pathology and Laboratory Medicine

Medically Relevant Pathogens Based on Gram Morphology

Gram-negative bacilli		
Escherichia coli	*Serratia marcescens*	*Pseudomonas aeruginosa*
Klebsiella pneumoniae	*Proteus mirabilis*	*Pseudomonas* species
Klebsiella oxytoca	*Morganella morganii*	*Stenotrophomonas maltophilia*
Enterobacter cloacae	*Aeromonas* species	*Acinetobacter baumanii*
Enterobacter aerogenes	*Providencia* species	*Achromobacter* species
Citrobacter freundii	*Salmonella* species	*Burkholderia cepacia*
Citrobacter koseri	*Shigella* species	

Gram-positive Cocci	
Gram-positive Cocci in Chains	**Gram-positive Cocci in Clumps**
Enterococcus species	*Staphylococcus aureus*
Streptococcus species, including:	*Staphylococcus* species, coagulase-negative
Streptococcus pyogenes (Group A)	*Staphylococcus lugdunensis*
Streptococcus agalactiae (Group B)	*Aerococcus* species
Streptococcus pneumoniae	*Rothia mucilaginosus*
Viridans group streptococci	
Streptococcus anginosus group	

Abbreviation Glossary for Antimicrobials

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

2011 ANTIBIOGRAM TABLES

Gram Positive Organisms – Percent Isolates Susceptible

Pathogen	No. Tested	AMP	CLOX	CRO	ERY	CLIN	GEN	NIT[a]	TET	SXT	VAN
Staphylococcus aureus (MSSA)	1730	-	100	-	76	80	-	100	97	99	100
Coagulase negative staphylococci	32	-	28	-	47	-	-	97	97	63	100
Enterococcus spp.	2893	98	-	-	-	-	73[b]	99	-	-	99
Streptococcus pneumoniae	76	-	-	100	79	-	-	-	-	94	100

Gram Negative Enterobacteriaceae – Percent Isolates Susceptible

Pathogen	No. Tested	AMP	A/C	P/T	FAZ	CXM	CRO	MERO	CIP	GEN	NIT[a]	SXT
Escherichia coli	10200	63	-	99	-	95	99	100	83	94	98	80
Escherichia coli ESBL	441	0	0	88	0	0	0	100	12	78	89	40
Klebsiella pneumoniae	1134	0	93	99	-	93	100	100	96	99	53	93
Klebsiella oxytoca	287	0	92	98	-	92	99	100	99	100	93	99
Citrobacter freundii	235	0	0	97	0	0	90	100	92	97	96	86
Enterobacter aerogenes	109	0	0	86	0	0	79	100	90	98	21	94
Enterobacter cloacae	262	0	0	87	0	0	81	100	86	100	25	86
Morganella morganii	83	0	0	99	0	0	98	100	84	87	0	80
Proteus mirabilis	380	79	-	99	-	97	98	100	86	95	0	82
Serratia marcesens	57	0	0	77	0	0	93	100	75	96	0	86

Gram Negative Non-Enterobacteriaceae – Percent Isolates Susceptible

Pathogen	No. Tested	PIP	CAZ	IMI	MERO	CIP	GEN	TOB	AMK	SXT
Pseudomonas aeruginosa	727	99	96	90	94	81	88	97	96	-
Stenotrophomonas maltophilia	59	0	58	0	0	-	-	-	-	92

-, 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. Although DTHR data are not available, 2009 data from the UAH reports CA-MRSA susceptibility to clindamycin and SXT as 71% and 97%, respectively.

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 many 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*.