

2016 UAH Antibigrams

University of Alberta Hospital

Cross Cancer Institute

Stollery Children's Hospital

Department of Laboratory Medicine and Pathology



Introduction

The antibiograms presented herein represent cumulative annual antimicrobial susceptibility rates of the most common microbial pathogens isolated from clinical specimens submitted to the University of Alberta Hospital (UAH) Clinical Microbiology Laboratory. This report represents the 2016 local susceptibility rates at the University of Alberta Hospital, Stollery Children's Hospital, and the Cross Cancer Institute, and is to be used as a resource to direct empiric antimicrobial therapy.

Antibiograms are generated by compiling susceptibility results from all first clinical isolates of a specific pathogen recovered from an individual patient per calendar year. That is, only the first isolate, regardless of specimen type or body site, is selected for analysis. Susceptibility rates for organisms represented by less than 30 isolates are not included due to the limited statistical significance.

The susceptibility testing methods used by the UAH Clinical Microbiology Laboratory include VITEK-2, gradient diffusion, microbroth dilution and disk diffusion. Interpretation of susceptibility testing results is based on Clinical and Laboratory Standards Institute (CLSI) guidelines.

The data presented herein is also available at the following website: www.antibiogram.ca.

We would like to acknowledge the effort of the entire clinical microbiology technologist staff in generating the data contained in this document. We would also like to acknowledge Dr. Darren Hudson, UAH, for his assistance with synthesizing antibiogram data.

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**UNIVERSITY OF ALBERTA HOSPITAL ANTIBIOGRAM
2016 ADULT CUMULATIVE GRAM-NEGATIVE ISOLATES (PERCENT SUSCEPTIBLE ISOLATES)**

ADULT GRAM-NEGATIVE (≥17 years old)		β-Lactams						Cephalosporins				Aminoglycosides			Other Mechanisms of Action				
		Ampicillin	Amoxicillin/ Clavulanate	Piperacillin/ tazobactam	Ertapenem	Meropenem	Imipenem	Cephalexin ^a	Cefixime	Ceftazidime	Ceftriaxone	Amikacin	Gentamicin	Tobramycin	Ciprofloxacin	Tetracycline	Doxycycline	Trimethoprim/ sulfamethoxazole	Nitrofurantoin ^a
<i>n</i>																			
<i>Acinetobacter baumannii</i>	30					100			73			100	100	96	96		93		
<i>Citrobacter freundii</i>	84			67	97	100			76	75	100	92	90	85	78		77	91	
<i>Enterobacter aerogenes</i>	60			68	98	100			68	70	100	100	100	98	90		95	18	
<i>Enterobacter cloacae</i>	280			73	89	97			76	75	100	98	97	95	89		91	64	
<i>Escherichia coli</i> (ALL)	1908	52	79	84	100	100		86	85	89	88	100	90	89	74	73		73	97
<i>Escherichia coli</i> (ESBL only)	188				98	99	100					98	69	58	18	40		40	90
<i>Klebsiella pneumoniae</i> (ALL)	557		89	85	99	99		90	89	89	89	99	95	89	88	79		89	42
<i>Klebsiella pneumoniae</i> (ESBL only)	56				100	100	100					100	71	26	26	19		60	21
<i>Morganella morganii</i>	58			91	100	100			66	84	89	100	87	93	87			77	
<i>Proteus mirabilis</i>	177	81	96	97	100	100		94	96	96	97	100	94	95	84			79	
<i>Pseudomonas aeruginosa</i> (CF)	84			88 ^b		91	75			91		57	67	71	82				
<i>Pseudomonas aeruginosa</i> (non-CF)	571			82 ^b		88	85			89		93	90	95	84				
<i>Serratia marcescens</i>	80			93	100	100				98	93	100	98	86	96	38		97	
<i>Stenotrophomonas maltophilia</i>	212									49							80 ^c	98	

^aUrinary tract isolates only.

^bRepresents activity of piperacillin only.

^cUsing minocycline breakpoints.

**UNIVERSITY OF ALBERTA HOSPITAL ANTIBIOGRAM
2016 ADULT CUMULATIVE GRAM-POSITIVE ISOLATES (PERCENT SUSCEPTIBLE OF INITIAL ISOLATES)**

ADULT GRAM-POSITIVE (≥17 years old)		β-Lactams					Other Mechanisms of Action							Aminoglycosides		
		Ampicillin	Amoxicillin	Penicillin	Ceftriaxone	Cloxacillin ^a	Clindamycin	Erythromycin	Levofloxacin	Nitrofurantoin ^b	Tetracycline	Trimethoprim/ sulfamethoxazole	Vancomycin	Linezolid	Gentamicin ^c	Streptomycin ^c
<i>n</i>																
<i>Staphylococcus aureus</i> MRSA	347						92	25	32	99	93	95	100	100	95	
<i>Staphylococcus aureus</i> MSSA	1476					100	83	79	93	99	97	96	100	100	98	
<i>Coagulase-negative</i> <i>Staphylococcus</i> species	211					43	56	41	48	99	92	54	100	100	76	
<i>Staphylococcus lugdunensis</i>	64					100	80	80	100	100	100	100	100	100	100	
<i>Enterococcus faecalis</i>	944	99							74	99	20		100	98	77	85
<i>Enterococcus faecium</i>	242	11							8	43	50		99	98	85	63
Viridans group streptococci	72			62	98								100			
<i>Streptococcus anginosus</i> group	37			100	100								100			
<i>Streptococcus pyogenes</i>	55			100	100		61	61								
<i>Streptococcus pneumoniae</i> (meningitis BPs) ^d	176			82	85								100			
<i>Streptococcus pneumoniae</i> (non-meningitis BPs) ^d	176		93	97	93		82	71	99			89	100			

^aCephalosporin (e.g., cefazolin) activity inferred by activity of cloxacillin for *Staphylococcus* spp.

^bUrinary tract isolates only.

^cUsed for synergistic purposes only.

^dBreakpoints (BPs) are defined differently for CSF and non-CSF isolates. Numbers do not reflect meningitis rates.

UNIVERSITY OF ALBERTA HOSPITAL ANTIBIOGRAM

2016 PEDIATRIC CUMULATIVE GRAM-NEGATIVE ISOLATES (PERCENT SUSCEPTIBLE ISOLATES)

PEDIATRIC GRAM-NEGATIVE (<17 years old)		β-Lactams						Cephalosporins				Aminoglycosides			Other Mechanisms of Action				
		Ampicillin	Amoxicillin/ Clavulanate	Piperacillin/ tazobactam	Ertapenem	Meropenem	Imipenem	Cephalexin ^a	Cefixime	Ceftazidime	Ceftriaxone	Amikacin	Gentamicin	Tobramycin	Ciprofloxacin	Tetracycline	Doxycycline	Trimethoprim/ sulfamethoxazole	Nitrofurantoin ^a
<i>n</i>																			
<i>Enterobacter cloacae</i>	44			88	100	100			90	88	100	100	100	97	95		86	59	
<i>Escherichia coli</i>	487	49	85	89	100	100		90	92	94	93	99	92	92	91	73		70	97
<i>Klebsiella pneumoniae</i>	60		70	86	100	100		91	92	92	95	100	92	88	87	82		72	57
<i>Proteus mirabilis</i>	34	70	100	97	100	100		97	96	100	97	100	85	85	100			82	
<i>Pseudomonas aeruginosa</i> (CF)	30			96 ^b		96	100			100		76	76	93	96				
<i>Pseudomonas aeruginosa</i> (non-CF)	91			91 ^b		92	91			92		87	86	93	92				
<i>Stenotrophomonas maltophilia</i>	36									30							83 ^c	100	

^aUrinary tract isolates only.

^bRepresents activity of piperacillin only.

^cUsing minocycline breakpoints.

**UNIVERSITY OF ALBERTA HOSPITAL ANTIBIOGRAM
2016 PEDIATRIC CUMULATIVE GRAM-POSITIVE ISOLATES (PERCENT SUSCEPTIBLE OF INITIAL ISOLATES)**

PEDIATRIC GRAM-POSITIVE (<17 years old)		Ampicillin	Amoxicillin	Penicillin	Ceftriaxone	Cloxacillin^a	Clindamycin	Erythromycin	Levofloxacin	Nitrofurantoin^b	Tetracycline	Trimethoprim/ sulfamethoxazole	Vancomycin	Linezolid	Gentamicin^c	Streptomycin^c
<i>n</i>																
<i>Staphylococcus aureus</i> MRSA	110						79	45	50	100	99	94	100	100	97	
<i>Staphylococcus aureus</i> MSSA	392					100	83	79	95	99	97	93	100	100	98	
<i>Coagulase-negative Staphylococcus species</i>	43					39	45	30	58	100	97	55	100	100	72	
<i>Enterococcus faecalis</i>	218	100							96	100	20		100	99	85	92
<i>Streptococcus pneumoniae</i> (meningitis BPs) ^d	41			78	82								100			
<i>Streptococcus pneumoniae</i> (non-meningitis BPs) ^d	41		96	95	91		92	78	100			68	100			

^aCephalosporin (e.g., cefazolin) activity inferred by activity of cloxacillin for *Staphylococcus* spp.

^bUrinary tract isolates only.

^cUsed for synergistic purposes only.

^dBreakpoints (BPs) are defined differently for CSF and non-CSF isolates. Numbers do not reflect meningitis rates.

UNIVERSITY OF ALBERTA HOSPITAL ANTIBIOGRAM

2016 GSICU CUMULATIVE GRAM-NEGATIVE and GRAM POSITIVE ISOLATES (PERCENT SUSCEPTIBLE ISOLATES)

GSICU GRAM-NEGATIVE		β-Lactams						Cephalosporins				Aminoglycosides			Other Mechanisms of Action			
		Ampicillin	Amoxicillin/ Clavulanate	Piperacillin/ tazobactam	Ertapenem	Meropenem	Imipenem	Cephalexin ^a	Cefixime	Ceftazidime	Ceftriaxone	Amikacin ^a	Gentamicin	Tobramycin	Ciprofloxacin	Tetracycline	Trimethoprim/ sulfamethoxazole	Nitrofurantoin ^a
<i>n</i>																		
<i>Escherichia coli</i>	71	38	75	82	99	99			80	86	85	100	85	87	75	58	69	99
<i>Klebsiella pneumoniae</i>	39		85	82	97	97			87	87	87	100	90	87	87	85	87	36
<i>Pseudomonas aeruginosa</i> (non-CF)	34			61 ^b		70	70			73		91	85	94	70			

^aUrinary tract isolates only.

^bRepresents activity of piperacillin only.

GSICU GRAM-POSITIVE		β-Lactams		Other Mechanisms of Action							Aminoglycosides		
		Ampicillin	Cloxacillin ^a	Clindamycin	Erythromycin	Levofloxacin	Nitrofurantoin ^b	Tetracycline	Trimethoprim/ sulfamethoxazole	Vancomycin	Linezolid	Gentamicin ^c	Streptomycin ^c
<i>n</i>													
<i>Staphylococcus aureus</i>	144		85	79	75	89	100	98	97	100	100	100	
<i>Enterococcus faecalis</i>	38	100				71	100	21		100	100	78	84

^aCephalosporin (e.g., cefazolin) activity inferred by activity of cloxacillin for *Staphylococcus* spp.

^bUrinary tract isolates only.

^cUsed for synergistic purposes only.

UNIVERSITY OF ALBERTA HOSPITAL ANTIBIOGRAM

2016 CROSS CANCER INSTITUTE CUMULATIVE GRAM-NEGATIVE and GRAM POSITIVE ISOLATES (PERCENT SUSCEPTIBLE ISOLATES)

CROSS CANCER INSTITUTE GRAM-NEGATIVE		β-Lactams						Cephalosporins				Aminoglycosides			Other Mechanisms of Action			
		Ampicillin	Amoxicillin/ Clavulanate	Piperacillin/ tazobactam	Ertapenem	Meropenem	Imipenem	Cephalexin ^a	Cefixime	Ceftazidime	Ceftriaxone	Amikacin	Gentamicin	Tobramycin	Ciprofloxacin	Tetracycline	Trimethoprim/ sulfamethoxazole	Nitrofurantoin ^a
<i>n</i>																		
<i>Escherichia coli</i>	85	47	82	80	100	100		86	86	87	88	100	91	92	72	81	71	98
<i>Klebsiella pneumoniae</i>	31		87	87	100	100			87	87	90	100	100	90	87	84	90	61

^aUrinary tract isolates only

CROSS CANCER INSTITUTE GRAM-POSITIVE		β-Lactams		Other Mechanisms of Action								Aminoglycosides	
		Ampicillin	Cloxacillin ^a	Clindamycin	Erythromycin	Levofloxacin	Nitrofurantoin ^b	Tetracycline	Trimethoprim/ sulfamethoxazole	Vancomycin	Linezolid	Gentamicin ^c	Streptomycin ^c
<i>n</i>													
<i>Staphylococcus aureus</i>	57		89	77	74	91	100	98	96	100	100	100	
<i>Enterococcus faecalis</i>	45	100				75	100	22		100	93	75	88

^aCephalosporin (e.g., cefazolin) activity inferred by activity of cloxacillin for *Staphylococcus* spp.

^bUrinary tract isolates only

^cUsed for synergistic purposes only