2020 UAH Antibiograms

University of Alberta Hospital

Cross Cancer Institute

Stollery Children's Hospital

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 2020 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, disk diffusion and microbroth dilution. Interpretation of susceptibility testing results is based on Clinical and Laboratory Standards Institute (CLSI) guidelines unless otherwise indicated.

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

We would like to acknowledge the effort of the APL - UAH Clinical Microbiology staff for generating the data presented herein. We would also like to thank the UAH/MAZ/KEC Antimicrobial Stewardship Program and the Stollery Children's Hospital Antimicrobial Stewardship Program for helping review this document. Finally, we would like to thank Dr. Darren Hudson for maintaining www.antibiogram.ca.

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UNIVERSITY OF ALBERTA HOSPITAL ANTIBIOGRAM
2020 ADULT CUMULATIVE GRAM-NEGATIVE ISOLATES (PERCENT SUSCEPTIBLE ISOLATES)

ADULT GRAM-NEGATIVE (≥18 years old)	*n*	**Ampicillin**	**Amoxicillin/ Clavulanate (PO)**	**Piperacillin/ Tazobactam**	**Cephalexin[a]**	**Cefixime**	**Ceftazidime**	**Ceftriaxone**	**Ertapenem**	**Meropenem**	**Imipenem**	**Gentamicin**	**Tobramycin**	**Ciprofloxacin**	**Levofloxacin**	**Trimethoprim/ Sulfamethoxazole**	**Nitrofurantoin[a]**
Citrobacter freundii complex	66			[b]		[b]	[b]	[b]	95	100		89	88	68		79	92
Citrobacter koseri	37			95		94		94	100	100		97	97	97		97	83
Enterobacter cloacae complex	234			[b]		[b]	[b]	[b]	88	98		99	98	88		89	43
Escherichia coli (ALL)	1591	52	76	95	84	84		86	100	100		90	90	65		73	96
Escherichia coli (ESBL only)	192								100	100		63	53	7		41	84
Haemophilus influenzae	[c]	62														63	
Klebsiella (Enterobacter) aerogenes	40			[b]		[b]	[b]	[b]	100	100		100	100	98		98	10
Klebsiella oxytoca	113		90	91		97		91	100	100		91	96	95		95	77
Klebsiella pneumoniae	377		93	95	93	94		95	99	99		98	98	85		91	32
Morganella morganii	35			[b]		[b]	[b]	[b]	100	100		86	91	63		71	
Proteus mirabilis	144	83	95	99	97	97		97	99	99		92	94	84		81	
Pseudomonas aeruginosa (CF)	125			83			85			87	79		83	55			
Pseudomonas aeruginosa (non-CF)	425			91			88			90	88		98	83			
Serratia marcescens	53			[b]		[b]	[b]	[b]	98	100		96	91	96		98	
Stenotrophomonas maltophilia	138						55								83	98	

Underlined values represent a ≥10% decrease from the previous year.

[a]Urinary tract isolates only.

[b]This organism may develop resistance to third generation cephalosporins and beta-lactam/beta-lactamase inhibitor combination during prolonged therapy.

[c]For *Haemophilus influenzae*, denominators are as follows: Ampicillin n=102, Trimethoprim/Sulfamethoxazole n=48.

UNIVERSITY OF ALBERTA HOSPITAL ANTIBIOGRAM
2020 ADULT CUMULATIVE GRAM-POSITIVE ISOLATES (PERCENT SUSCEPTIBLE ISOLATES)

ADULT GRAM-POSITIVE (≥18 years old)	*n*	**Ampicillin**	**Penicillin**	**Ceftriaxone**	**Cloxacillin**[a]	**Clindamycin**	**Erythromycin**	**Levofloxacin**	**Nitrofurantoin**[b]	**Tetracycline**[c]	**Trimethoprim/ Sulfamethoxazole**	**Vancomycin**	**Linezolid**
Staphylococcus aureus (ALL)	1600				76	81		81	99	96	93	100	100
Staphylococcus aureus (MRSA)	376					77		36	100	94	93	100	100
Staphylococcus aureus (MSSA)	1224				100	83		95	99	97	93	100	100
Coagulase-negative Staphylococcus species	188				39	59		53	99	91	59	100	100
Staphylococcus lugdunensis	58				95	96		100	100	98	100	100	100
Enterococcus faecalis	754	100							99	19		100	99
Enterococcus faecium	284	8							14	21		73	99
Viridans group streptococci	48		75	93								100	
Streptococcus anginosus group	42		100	97								100	
Streptococcus pyogenes	70		100			99	94[e]						
Streptococcus pneumoniae (meningitis BPs)[d]	90		77	86								100	
Streptococcus pneumoniae (non-meningitis BPs)[d]	90		99	99		88	74[e]	100		78[e]	86	100	

[a]Cephalosporin (e.g., cefazolin) activity inferred by activity of cloxacillin for *Staphylococcus* spp.

[b]Urinary tract isolates only. [c]Tetracycline susceptibility predicts susceptibility to doxycycline.

[d]Breakpoints (BPs) are defined differently for CSF and non-CSF isolates. Numbers do not reflect meningitis rates.

[e]Erythromycin predicts susceptibility to azithromycin.

UNIVERSITY OF ALBERTA HOSPITAL ANTIBIOGRAM
2020 CUMULATIVE YEAST ISOLATES (PERCENT SUSCEPTIBLE ISOLATES)

YEAST (ALL AGES, STERILE SITES)	*n*	Amphotericin B[a]	Fluconazole	Micafungin
Candida albicans	34	100	97	100

[a]Using interpretive breakpoints from EUCAST.

UNIVERSITY OF ALBERTA HOSPITAL ANTIBIOGRAM
2020 CUMULATIVE ANAEROBE ISOLATES (PERCENT SUSCEPTIBLE ISOLATES)

ADULT ANAEROBE (≥18 years old)	*n*	Penicillin	Ceftriaxone	Clindamycin	Metronidazole
Cutibacterium acnes	41	100	100	95	

UNIVERSITY OF ALBERTA HOSPITAL ANTIBIOGRAM
2020 PEDIATRIC CUMULATIVE GRAM-NEGATIVE ISOLATES (PERCENT SUSCEPTIBLE ISOLATES)

PEDIATRIC GRAM-NEGATIVE (<18 years old)	*n*	**Ampicillin**	**Amoxicillin/ Clavulanate (PO)**	**Piperacillin/ Tazobactam**	**Cephalexin[a]**	**Cefixime**	**Ceftazidime**	**Ceftriaxone**	**Ertapenem**	**Meropenem**	**Imipenem**	**Gentamicin**	**Tobramycin**	**Ciprofloxacin**	**Levofloxacin**	**Trimethoprim/ Sulfamethoxazole**	**Nitrofurantoin[a]**
Enterobacter cloacae complex	40			[b]		[b]	[b]	[b]	100	100		95	93	95		90	40
Escherichia coli (ALL)	506	47	77	95	88	89	90	89	100	100		90	90	75		72	98
Escherichia coli (ESBL only)	45								100	100		60	51	7		44	87
Klebsiella oxytoca	35		86	91	[c]	91	94	91	100	100		94	94	97		89	94
Klebsiella pneumoniae	42		95	95	[c]	95	95	95	100	100		95	95	93		90	40
Pseudomonas aeruginosa (non-CF)	52			100			100			96	94		98	98			
Stenotrophomonas maltophilia	57						44								79	100	

Underlined values represent a ≥10% decrease from the previous year.

[a]Urinary tract isolates only.

[b]This organism may develop resistance to third generation cephalosporins and beta-lactam/beta-lactamase inhibitor combination during prolonged therapy.

[c]Insufficient number of isolates tested to report.

UNIVERSITY OF ALBERTA HOSPITAL ANTIBIOGRAM
2020 PEDIATRIC CUMULATIVE GRAM-POSITIVE ISOLATES (PERCENT SUSCEPTIBLE ISOLATES)

PEDIATRIC GRAM-POSITIVE (<18 years old)	*n*	**Ampicillin**	**Penicillin**	**Ceftriaxone**	**Cloxacillin**[a]	**Clindamycin**	**Erythromycin**	**Levofloxacin**	**Nitrofurantoin**[b]	**Tetracycline**[c]	**Trimethoprim/ Sulfamethoxazole**	**Vancomycin**	**Linezolid**	**Gentamicin**[d]
Staphylococcus aureus (ALL)	486				77	87	73	82	100	98	91	100	100	*98*
Staphylococcus aureus (MRSA)	111					86	45	45	100	97	89	100	100	*95*
Staphylococcus aureus (MSSA)	375				100	87	81	93	100	98	92	100	100	*99*
Coagulase-negative Staphylococcus species	47				38	60	30	78	100	85	62	100	100	*74*
Enterococcus faecalis	163	100							100	28		100	99	*91*

Underlined values represent a ≥10% decrease from the previous year.

[a]Cephalosporin (e.g., cefazolin) activity inferred by activity of cloxacillin for *Staphylococcus* spp.

[b]Urinary tract isolates only.

[c]Tetracycline susceptibility predicts susceptibility to doxycycline.

[d]Used for synergistic purposes only.

UNIVERSITY OF ALBERTA HOSPITAL ANTIBIOGRAM
2020 GSICU CUMULATIVE GRAM-NEGATIVE AND GRAM-POSITIVE ISOLATES (PERCENT SUSCEPTIBLE ISOLATES)

GSICU GRAM-NEGATIVE	*n*	Ampicillin	Amoxicillin/ Clavulanate (PO)	Piperacillin/ Tazobactam	Cefixime	Ceftazidime	Ceftriaxone	Ertapenem	Meropenem	Imipenem	Gentamicin	Tobramycin	Ciprofloxacin	Trimethoprim/ Sulfamethoxazole	Nitrofurantoin[a]
Escherichia coli	48	50	60	85	74		79	98	100		88	<u>83</u>	<u>63</u>	<u>63</u>	96
Pseudomonas aeruginosa	44			82		75			75	77		95	68		

Underlined values represent a ≥10% decrease from the previous year.
Other Gram negative organisms were in insufficient quantities to report on this year's antibiogram.
[a]Urinary tract isolates only.

GSICU GRAM-POSITIVE	*n*	Cloxacillin[a]	Clindamycin	Levofloxacin	Nitrofurantoin[b]	Tetracycline[c]	Trimethoprim/ Sulfamethoxazole	Vancomycin	Linezolid
Staphylococcus aureus	139	79	82	86	100	95	96	100	100

Other Gram positive organisms were in insufficient quantities to report on this year's antibiogram.
[a]Cephalosporin (e.g., cefazolin) activity inferred by activity of cloxacillin for *Staphylococcus* spp.
[b]Urinary tract isolates only.
[c]Tetracycline susceptibility predicts susceptibility to doxycycline.

UNIVERSITY OF ALBERTA HOSPITAL ANTIBIOGRAM
2020 CROSS CANCER INSTITUTE CUMULATIVE GRAM-NEGATIVE and GRAM POSITIVE ISOLATES (PERCENT SUSCEPTIBLE ISOLATES)

CROSS CANCER INSTITUTE GRAM-NEGATIVE	*n*	Ampicillin	Amoxicillin/ Clavulanate (PO)	Piperacillin/ Tazobactam	Cephalexin[a]	Cefixime	Ceftriaxone	Ertapenem	Meropenem	Gentamicin	Tobramycin	Ciprofloxacin	Trimethoprim/ Sulfamethoxazole	Nitrofurantoin[a]
Escherichia coli	77	64	82	94	84	84	88	100	100	95	91	64	80	97
Klebsiella pneumoniae	36			83	[b]	86	86	100	100	89	89	86	83	25

Underlined values represent a ≥10% decrease from the previous year.
Other Gram negative organisms were in insufficient quantities to report on this year's antibiogram.
[a]Urinary tract isolates only.
[b]Insufficient number of isolates tested to report.

CROSS CANCER INSTITUTE GRAM-POSITIVE	*n*	Ampicillin	Cloxacillin[a]	Clindamycin	Levofloxacin	Nitrofurantoin[b]	Tetracycline[c]	Trimethoprim/ Sulfamethoxazole	Vancomycin	Linezolid
Staphylococcus aureus	39		90	85	92	97	97	95	100	100
Enterococcus faecalis	40	100				100	30		100	100

Underlined values represent a ≥10% decrease from the previous year.
Other Gram positive organisms were in insufficient quantities to report on this year's antibiogram.
[a]Cephalosporin (e.g., cefazolin) activity inferred by activity of cloxacillin for *Staphylococcus* spp.
[b]Urinary tract isolates only.
[c]Tetracycline susceptibility predicts susceptibility to doxycycline.