

2017 Antibigram

Central Zone

Alberta Health Services

including

Red Deer Regional Hospital

St. Mary's Hospital, Camrose



Introduction

This antibiogram is a cumulative report of the antimicrobial susceptibility rates of common microbial pathogens isolated from infections in samples submitted to Red Deer Regional Hospital Microbiology Laboratory and to St. Mary's Hospital Laboratory, Camrose to antimicrobials available on the hospital formularies. This cumulative data in general reflects overall rates of antimicrobial susceptibilities throughout Central Zone since the large majority of samples submitted from the Zone are processed in the microbiology laboratories in the two hospitals. The antibiogram is intended to be used as an *in vitro* resource to assist with empiric antimicrobial therapy.

The antibiogram represents the results of first clinical isolates collected from individual patients in a calendar year from a specific body site. The rationale is to avoid over representation of antimicrobial resistance that may develop during prolonged stays in hospital. Susceptibility rates for individual species (or groups of similar species) of less than 30 isolates are not calculated, due to limited statistical significance and interpretive value.

This antibiogram contains summary data for the 2017 calendar year and is divided alphabetically into Gram-negative and Gram-positive bacterial species. Specific anaerobic bacteria are included in the lists even if they have fewer than 30 strains isolated. No yeasts are included because the laboratory does not perform susceptibility testing on yeasts. For susceptibility results on those micro-organisms the reader can consult <http://www.antibiogram.ca>.

A significant amount of work is required to generate this data, and the efforts of Debbie Dyrland and Valerie Burton in the Microbiology Laboratories are gratefully acknowledged.

The Antibiogram is available in PDF format at <https://www.albertahealthservices.ca/lab/Page3294.aspx>

Inquiries and feed-back can be directed to the Microbiology Laboratory, Red Deer Regional Hospital or to the Microbiology Consultant (available through the laboratory).

Comments on Bacterial species included in the Antibiogram.

Gram-negative bacteria.

Acinetobacter includes both the *A. baumannii* complex, *A. lwoffii*, and unspiciated isolates.

Bacteroides includes both *B. fragilis*, and *B. fragilis* group isolates (*B. thetaiotaomicron*, *B. ovatus*, *B. uniformis* and *B. vulgatus*).

Citrobacter species are separated from *C. freundii* and include *C. amalonaticus*, *C. braakii*, *C. koseri*, *C. werkmanii*, *C. youngae*, and unspiciated isolates.

Enterobacter species include unspiciated isolates other than *E. aerogenes* and *E. cloacae* complex.

Gram-positive bacteria.

Beta-haemolytic streptococci are grouped together and include *S. pyogenes* (Group A), *S. agalactiae* (Group B) *S. equisimilis*, *S. equi* and *S. zooepidemicus* (Group C and Group G) isolates.

Coagulase negative staphylococci include *S. epidermidis*, and a variety of other species. Most of the coagulase negative staphylococci isolated are considered part of normal flora, and antimicrobial susceptibilities are not routinely performed on these micro-organisms.

Vancomycin –resistant enterococci are included and separated from *E. faecalis* and *E. faecium* isolates for epidemiological purposes (less than 30 isolates in 2017) and to provide information for treatment options in cases of serious infections with these organisms. For 2017, Only *E. faecium* VRE were recovered.

Staphylococcus aureus is divided into MSSA and MRSA strains for epidemiological purposes and for treatment options for MRSA as required.

The *Streptococcus anginosus* group includes *S. anginosus*, *S. constellatus* and *S. intermedius* species. All these species are generally grouped for reporting purposes as *S. anginosus* group since they have similar antimicrobial susceptibility patterns. For 2017, *Streptococcus bovis* group has been added.

For other species not listed in the Tables (e.g., fewer than 30 isolates), information is available on a specific basis by contacting the Microbiology Laboratory at Red Deer Regional Hospital 1-403-343-4731.

Abbreviations

Abbreviations Glossary for Antimicrobials in this Antibiogram

Antimicrobial	Abbreviation	Antimicrobial	Abbreviation
Amikacin	AMK	Levofloxacin	LEV
Ampicillin	AMP	Linezolid	LNZ
Amoxicillin-Clavulanate	AMC	Meropenem	MERO
Ceftriaxone	CAX	Metronidazole	MTZ
Ceftazidime	CAZ	Nitrofurantoin	NIT
Cephalexin	LEX	Penicillin	PEN
Ciprofloxacin	CIP	Penicillin-meningitis	P-MEN
Clindamycin	CLIN	Penicillin Non-meningitis	P- NMEN
Cloxacillin	CLOX	Piperacillin-Tazobactam	P-T
Doxycycline	DOXY	Rifampin	RIF
Ertrapanem	ERT	Streptomycin Synergy	STRSYN
Erythromycin	ERY	Tetracycline	TET
Fosfomycin	FOS	Tigecycline	TIG
Gentamicin	GEN	Tobramycin	TOB
Gentamicin Synergy	GM500	Trimethoprim-sulfamethoxazole	SXT
Imipenem	IMI	Vancomycin	VAN

Comments on the 2017 Antibiogram

Summary of Susceptibility Changes in 2017 compared to the 2016 Antibiogram

Greater than 5-10% change year over year. In some cases fewer isolates within a species may accentuate differences. Presence of strains with specific mechanisms of resistance may also alter overall susceptibility rates for certain antimicrobial agents. For details, please consult the Microbiologist for Central Zone.

Other notes regarding updated reporting for specific species and antimicrobial agents are included in the lists below.

Gram-negative bacteria.

- *Acinetobacter species*. Reduced susceptibility amikacin, amoxicillin-clavulanate, ampicillin by >10%; Increased susceptibility to ceftazidime, piperacillin-tazobactam, co-trimoxazole (SXT) by > 10%.
- *Citrobacter freundii*. No significant change from 2016.
- *Citrobacter species*. Reduced susceptibility to amoxicillin-clavulanate, ampicillin by > 10%.
- *Escherichia coli*. Fosfomycin is tested and reported only on ESBL-producing isolates from the urinary tract.
- *Enterobacter cloacae* complex and *Enterobacter sp.* Reduced susceptibility to nitrofurantoin by > 10%.
- *Haemophilus influenzae*. Increased susceptibility to meropenem by > 10%; decreased susceptibility to co-trimoxazole (SXT) by > 15%.
- *K. oxytoca* and *K. pneumoniae*. Decreased susceptibility to nitrofurantoin by >10%.
- *M. morgani*. Decreased susceptibility to tetracycline by >10%.
- *P. mirabilis*. No significant change from 2016.
- *Stenotrophomonas maltophilia*. Decreased susceptibility to co-trimoxazole (SXT) by > 15%.

Gram-positive bacteria.

- Coagulase-negative staphylococci. Some changes in susceptibility may occur that are a result of different species being isolated. Since most coagulase negative staphylococci are not speciated, these changes cannot be quantified readily.
- *E. faecium* (VRE). Decreased susceptibility to gentamicin-synergy by 30%. Increased susceptibility to tetracycline by > 25%.
- MRSA. No significant change from 2016.
- *S. aureus* (MSSA). Cefazolin susceptibility may be inferred from the cloxacillin reported result.
- *S. pneumoniae*. Decreased susceptibility to penicillin (meningitis breakpoint) by 10%. Changes tend to reflect occurrence of different strains in the population.

For additional information on interpretation of the Tables or on antimicrobial agents not reported in the Tables, please contact the Microbiologist through one of the laboratories in Central Zone.

Gram Negative bacteria (2017)	Antimicrobial Agent (% S)																				
	Amikacin (AMK)	Amox/Clav (AMC)	Ampicillin (AMP)	Ceftazidime (CAZ)	Ceftriaxone (CAX)	Ciprofloxacin (CIP)	Clindamycin (CLIN)	Cephalexin (LEX)	Ertapenem (ERT)	Fosfomycin (FOS)	Gentamicin (GEN)	Imipenem (IMI)	Meropenem (MERO)	Metronidazole (MTZ)	Nitrofurantoin (NIT)	Piperacillin/ Tazobactam(P-T)	Tetracycline (TET)	Tobramycin (TOB)	Trimethoprim/ Sulpha (SXT)	Levofloxacin (LEV)	Doxycycline (DOXY)
Organism (No.)																					
Acinetobacter species (31)	83	26	17	72	8	100					97		96		0	77	100	93	100		
Bacteroides fragilis group (15)							67							93							
Citrobacter freundii (110)	100	0	0	88	85	94			99		99		98		93	88	86	97	88		
Citrobacter species (243)	100	50	2	94	94	98			100		99		100		90	95	94	99	97		
Enterobacter aerogenes (95)	100	0	0	89	89	98			100		100		100		16	90	95	100	99		
Enterobacter cloacae complex (334)	100	0	0	88	83	98			93		99		97		38	87	94	99	95		
Enterobacter species (33)	100	6	0	97	94	97			94		100		100		30	93	97	100	97		
Escherichia coli – All (9233)	99	83	61	94	93	84		92	100	99	94	99	99		98	95	79	93	81		
Escherichia coli – ESBL only (549)	98	38	0	0	0	31		0	98	99	72	99	99		92	67	44	62	53		
Haemophilus influenzae (48)			48		96								96						46		
Klebsiella oxytoca (308)	100	91	0	100	95	99		85			99		100		84	93	95	99	98		
Klebsiella pneumoniae All (1218)	100	94	0	97	97	97		96	100		97		100		37	97	90	97	94		
Klebsiella pneumoniae – ESBL only (30)	100	27	0	0	0	33		0	100		27	97	100		7	55	38	20	20		
Morganella morganii (92)	97	0	0	91	91	74			99		79		100		0	98	8	88	70		
Proteus mirabilis (520)	99	91	78	98	98	85		96	100		93		100		0	99	0	94	80		
Pseudomonas aeruginosa (620)	97	0	0	91	0	92			0		94		93		0	92	0	99	0		
Serratia marcescens (41)	100	0	0	100	95	100			100		100		100		0	100	29	97	100		
Stenotrophomonas maltophilia (52)																			79	73	78

Gram Positive bacteria

Antimicrobial Agent (%S)																			
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(2017)

Organism (No.)	Ampicillin (AMP)	Ceftriaxone (CAX)	Ciprofloxacin (CIP)	Clindamycin (CLIN)	Cloxacillin (CLOX)	Erythromycin (ERY)	Gentamicin (GEN)	Gentamicin Synergy Screen (GM500)	Linezolid (LNZ)	Nitrofurantoin (NIT)	Penicillin (PEN)	Penicillin (Meningitis) (P-Men)	Penicillin (Non-meningitis) (P-NMEN)	Rifampin (RIF)	Streptomycin Synergy Screen (STRSYN)	Tetracycline (TET)	Tigicyline (TIG)	Trimethoprim-sulpha (SXT)	Vancomycin (VAN)
Beta hemolytic Strep (188)	99			64		61					100								100
Coagulase negative Staph (112)			68	65	51	46	91		100	99	16			97		88	100	73	100
Enterococcus faecalis (2547)	99		81	0		7		80	98	99					86	20	100		100
Enterococcus faecium (196)	39		29	0		4		92	94	28					78	59	100		100
Enterococcus faecium (VRE) (19)	5		0	0		0		74	95	17					67	39	100		0
Staph aureus MSSA (2177)			88	81	99	77	99		100	99	30			100		97	100	98	100
Staph aureus MRSA (900)			43	66	0	42	99		100	99	0			100		96	100	98	100
Staph lugdunensis (124)			99	87	90	87	99		100	100	60			99		96	100	100	100
Strep anginosus group (45)	95										100								100
Strep bovis group (167)		100									99								100
Strep pneumoniae (114)						73					82	83	100					90	100