Adult Antibiogram – Milton S. Hershey Medical Center – 2018 Data

A joint effort of the Clinical Microbiology Laboratory and the Antimicrobial Stewardship Program

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Purpose: To report susceptibilities of common bacteria and yeast isolates from January to December of 2018.

Contents: Inpatient and outpatient data for Gram-positive and Gram-negative bacteria, and data for *Candida* species.

What data are included: As per national recommendations, the data reflect the first isolate for any patient, at any site, during the time period of this antibiogram, and only bacteria with at least 30 isolates are shown.

How to use: Percent susceptibility is shown for selected bug–drug combinations. A blank box can mean that a particular drug is inappropriate for that organism, or that a simpler drug in that class usually can be used.

Please note: Although antibiograms can guide empiric therapy before microbiological data are available, quality care and good stewardship require considering additional clinical information and may require an Infectious Diseases consult.

Selected Recent Data (by year):

Methicillin (Oxacillin)-Resistant *Staph aureus* (MRSA)

2017: 36% of inpatient isolates and 29% of outpatient isolates
2018: 32% of inpatient isolates and 27% of outpatient isolates

Methicillin (Oxacillin)-Resistant Coagulase-Negative Staphylococci (MRCNS)

2017: 53% of inpatient isolates and 34% of outpatient isolates
2018: 53% of inpatient isolates and 28% of outpatient isolates

Vancomycin-Resistant *Enterococcus* (VRE)

2017: 17% of inpatient isolates and 5% of outpatient isolates; 3% of *E. faecalis* but 60% of *E. faecium*
2018: 16% of inpatient isolates and 6% of outpatient isolates; 3% of *E. faecalis* but 53% of *E. faecium*

For questions, please contact:

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Hershey Medical Center Adult Antibiogram for Gram-Positives, Jan – Dec 2018 (Inpatient at top and Outpatient at bottom)

Gram-Positives January – December, 2018	# Isolates Tested (not all tested for each drug)	% Susceptible (A blank box can mean that drug is inappropriate for that bacteria or that a simpler drug in that class usually can be used)																				
		Penicillins and Cephalosporins					Macrolides		Fluoroquinolones			Amino-glycosides		Others (in alphabetical order)								
Common Gram-Positive Organisms		Penicillin	Ampicillin	Amoxicillin / Clavulanate	Oxacillin	Ceftriaxone	Azithromycin	Erythromycin	Ciprofloxacin	Levofloxacin	Moxifloxacin	Gentamicin (Do not use alone)	Gentamicin Synergy	Clindamycin	Daptomycin	Linezolid	Nitrofurantoin (for urine infections)	Quinupristin / Dalfopristin	Rifampin (Do not use alone)	Tetracycline	Trimethoprim / Sulfamethoxazole	Vancomycin
INPATIENT																						
Staph aureus (total)	680	0	0	68	68	68		48	68	70	80	98		71	100	100	100	99	98	93	97	100
Staph aureus (MRSA only)	219	0	0	0	0	0		12	25	26	46	97		56	100	100	*	100	98	90	93	100
Staph aureus (MSSA only)	461	0	0	100	100	100		64	88	91	95	98		77	100	100	*	100	98	94	99	100
Staph coag. neg.	283	0	0	47	47	47		41	62	62	76	78		59	99	100	*	99	99	85	64	100
Strep pneumoniae	31	68**		100		97**	53	53		97				93						94	74	100
Viridans Strep group	47	83	87			100	51	45		83				83						64		100
Enterococcus faecalis	288	100	100						70	76			79		100	99	99			23		94
Enterococcus faecium	79	27	29						16	20			97		89	96	35			28		49
OUTPATIENT ***																						
Staph aureus (total)	822	0	0	73	73	73		47	71	74	85	98		73	100	100	100	99	99	94	99	100
Staph aureus (MRSA only)	220	0	0	0	0	0		15	30	34	61	96		66	100	100	*	100	100	93	98	100
Staph aureus (MSSA only)	602	0	0	100	100	100		59	85	89	94	99		75	100	100	100	100	99	95	100	100
Staph coag. neg.	128	0	0	72	72	72		56	84	86	88	93		75	100	100		98	98	84	81	100
Strep pneumoniae	26*	65**		96*		92**	38*	35*		100*				96*						92*	81*	100*
Enterococcus faecalis	291	100	100						76	85			81		100	98	99			26		99
Enterococcus faecium	26*	12*	12*						4*	8*			96*		92*	92*	36*			27*		42*

Footnotes:

* Fewer than 30 isolates tested, so results are not considered statistically reliable.

** The Penicillin-Resistant *Streptococcus pneumoniae* (PRSP) rates shown above (32% for inpatients and 35% for outpatients) used the "meningitis" breakpoints, which are very conservative. However, most *S. pneumoniae* outside the central nervous system (such as in the respiratory tract) are treatable with penicillin. If the higher "non-meningitis" breakpoints are used, 0% of our *S. pneumoniae* would be resistant to penicillin and 2% would be resistant to ceftriaxone (as combined inpatient and outpatient data).

*** Outpatient numbers and data include Pediatric isolates.

Comments:

– The Methicillin (Oxacillin)-Resistant *Staphylococcus aureus* (MRSA) rate was 32% for inpatients and 27% for outpatients.

– The Methicillin (Oxacillin)-Resistant Coagulase-Negative Staphylococci (MRCNS) rate was 53% for inpatients and 28% for outpatients.

– The Vancomycin-Resistant *Enterococcus* (VRE) rate was 16% for inpatients (6% of *E. faecalis* and 51% of *E. faecium*) and 6% for outpatients (1% of *E. faecalis* and 58% of *E. faecium*).

Hershey Medical Center Adult Antibiogram for Gram-Negatives, Jan – Dec 2018 (Inpatient at top and Outpatient at bottom)

Gram-Negatives January – December, 2018		% Susceptible (A blank box can mean that drug is inappropriate for that bacteria or that a simpler drug in that class usually can be used)																			
		Penicillins and Cephalosporins					β-lactam/β-lactamase Inhibitor Combinations			Mono-bactam	Carbapenems		Fluoroquinolones			Aminoglycosides			Others		
Common Gram-Negative Organisms	# Isolates Tested (not all tested for each drug)	Ampicillin	Cefazolin	Ceftriaxone	Ceftazidime	Cefepime	Amoxicillin / Clavulanate	Ampicillin / Sulbactam	Piperacillin / Tazobactam	Aztreonam	Meropenem	Ertapenem	Ciprofloxacin	Levofloxacin	Moxifloxacin	Gentamicin	Tobramycin	Amikacin	Nitrofurantoin (for urine infections)	Tetracycline	Trimethoprim / Sulfamethoxazole
INPATIENT																					
Escherichia coli	691	56	66	90	92	93	81	62	96	91	100	100	77	77	77	92	91	100	98	75	78
Klebsiella pneumoniae	234	0	82	89	90	91	89	77	93	91	98	98	91	94	92	97	94	100	42	82	86
Pseudomonas aeruginosa	230				91	86			89	75	91		83	80		81	97	96			
Proteus mirabilis	127	76	63	99	99	99	93	90	99	93	100	100	65	69	74	95	95	100	0	0	74
Enterobacter cloacae	103	0	0	69	73	93	0	0	77	72	99	83	95	97	97	95	96	100	12	83	90
Enterobacter aerogenes	36	0	0	72	72	100	0	0	89	78	100	94	97	97	*	100	100	100	*	94	97
Serratia marcescens	62	0	0	94	94	98	0	0	90	92	98	98	98	98	100	100	94	100	*	5	98
Citrobacter freundii	44	0	0	70	84	100	0	0	98	77	100	100	93	93	100	93	89	100	97	82	84
Morganella morganii	33	0	0	67	61	97	0	3	100	79	100	97	73	85	67	88	94	97	*	39	58
Stenotrophomonas maltophilia	36				42									89							97
OUTPATIENT **																					
Escherichia coli	1903	59	75	94	96	96	87	63	99	95	100	100	85	85	73	93	94	100	99	78	80
Klebsiella pneumoniae	281	0	84	94	94	95	91	81	95	93	99	98	93	96	89	96	94	100	39	80	86
Pseudomonas aeruginosa	235				97	95			96	86	96		86	85		85	99	97			
Proteus mirabilis	172	86	75	99	100	99	99	94	100	97	100	99	81	84	81	94	95	99	0	0	81
Enterobacter cloacae	94	0	0	70	80	97	0	0	88	81	100	83	98	100	100	98	98	100	33	81	90
Enterobacter aerogenes	45	0	0	69	71	100	0	0	87	76	100	98	98	98	100	100	100	100	10	96	98
Serratia marcescens	73	0	0	95	93	100	0	0	92	90	99	96	95	100	100	97	92	97	0	11	100
Citrobacter freundii	56	0	0	82	88	98	0	0	100	89	100	100	91	95	83	89	91	100	94	79	82
Stenotrophomonas maltophilia	63				40									90							97

Footnotes:

* Fewer than 30 isolates tested, so results are not considered statistically reliable.

** Outpatient data include Pediatric isolates.

Combination Adult Antibiogram for Selected Inpatient Gram-Negatives, Jan - Dec 2018

Gram-Negatives January – December, 2018	# Isolates Tested	% Susceptible (*In vitro* susceptibility to each drug alone or to at least one of the indicated combination of drugs)															
		Ceftazidime				Cefepime				Piperacillin/tazobactam				Meropenem			
			PLUS				PLUS				PLUS				PLUS		
Common Gram-Negative Organisms		(Alone)	Ciprofloxacin	Gentamicin	Tobramycin	(Alone)	Ciprofloxacin	Gentamicin	Tobramycin	(Alone)	Ciprofloxacin	Gentamicin	Tobramycin	(Alone)	Ciprofloxacin	Gentamicin	Tobramycin
Escherichia coli	691	92	95	99	98	93	95	99	98	96	98	99	99	100	100	100	100
Klebsiella pneumoniae	234	90	93	97	95	91	93	97	94	93	97	99	98	98	98	99	98
Pseudomonas aeruginosa	230	91	97	96	99	86	94	93	98	89	95	95	98	91	96	96	99
Enterobacter cloacae	103	73	96	96	97	93	98	98	98	77	97	97	100	99	100	100	100

HMC Antibiogram (Adult + Pediatric) for *Candida* species, Jan 2017 – Dec 2018 (2 years)

Yeast January 2017 – December, 2018	# Isolates Tested	% Susceptible				
		Azoles			Other	
Candida* Species *		Fluconazole	Itraconazole****	Voriconazole	Micafungin*****	Flucytosine****
C. albicans	110	91	95	94	99	97
C. glabrata	67	82***	48		93	100
C. krusei	9*	0	89*	100*	100*	0*
C. parapsilosis	38	95	100	100	94	100
C. tropicalis	18*	89*	100*	89*	100*	100*
Candida spp. (other)	15*	100*	100*	100*	100*	87*

Footnotes:

* Fewer than 30 isolates tested, so results are not considered statistically reliable.

** *Candida* data include Pediatric isolates.

*** *C. glabrata* susceptibility to fluconazole is dose-dependent, and a daily dose of at least 50x the MIC is suggested; empiric dosing of 800 mg daily would be sufficient for only 47% of isolates, and 400 mg daily would be sufficient for only 18% of isolates.

**** Itraconazole and flucytosine data are provided for information purposes, but there is uncertainty as to their clinical relevance.

***** Caspofungin is the formulary echinocandin at HMC.