



HSHS
St. John's
Hospital

Springfield, Illinois

CUMULATIVE ANTIMICROBIAL SUSCEPTIBILITY REPORT

January - December, 2021
(Includes Inpatients and Outpatients)

The Cumulative Antimicrobial Susceptibility Report should be considered a guide. Individual therapy should always be based on characteristics of the patient's infecting organism.

For questions, please call the Microbiology Laboratory at ext. 44135 or 814-4135.

CUMULATIVE ANTIBIOGRAM: ALL LOCATIONS AND AGES --- 2021

Gram Negative Organisms % Susceptible	# Isolates tested 2021	% Change in Isolates tested from 2020	Ampicillin	Ampicillin / sulbactam	Amoxicillin/ clavulanic acid	Piperacillin / tazobactam	Imipenem	Meropenem	Ertapenem	Aztreonam	Cefazolin	Cefotaxime/ Ceftriaxone ¹	Ceftazidime	Cefepime	Amikacin	Gentamicin	Tobramycin	Ciprofloxacin	Levofloxacin	Minocycline	Tetracycline	Trimethoprim/ Sulfamethoxazole	Nitrofurantoin [^]	# Isolates tested with Nitrofurantoin [^]
<i>Acinetobacter species</i> ²	75	+3		76		59	65	-			-	-	65	65	83	81	83	63	65	-	61	66	-	-
<i>Citrobacter freundii</i> [^]	83	+12				89	94	100	100	78		75	-	99	-	96	-	89	86	-	76	86	86	56
<i>Citrobacter koseri</i>	62	+48		-	97	97	100	100	100	97	69	98	-	100	-	100	-	100	100	-	98	98	86	44
<i>Enterobacter cloacae complex</i> [^]	220	-9				82	96	100	99	80		77	-	97	-	95	-	96	94	-	89	91	34	79
<i>E. coli</i> [^]	2802	+8	57	-	83	98	100	100	100	95	86	94	-	97	-	93	-	80	78	-	81	80	97	2418
<i>Klebsiella aerogenes</i>	99	+24				80	71	100	100	84		78	-	99	-	99	-	100	99	-	96	98	18	66
<i>Klebsiella oxytoca</i> [^]	154	+21		-	91	94	100	100	100	93	5	92	-	100	-	97	-	97	97	-	93	97	76	66
<i>Klebsiella pneumoniae</i> [^]	781	+44		-	93	95	98	99	99	94	79	93	-	98	-	96	-	92	90	-	83	88	30	538
<i>Morganella morganii</i>	57	-21		-		100	35	100	100	88		79	-	86	-	84	-	63	68	-	-	73		
<i>Proteus mirabilis</i> [^]	329	-2	73	-	99	100	17	100	100	97	64	95	-	95	-	92	-	74	74	-		74		
<i>Providencia rettgeri</i>	26	-7		-		96	69	92	88	92		100	-	96	-	100	-	65	62	-		58		
<i>Pseudomonas aeruginosa</i>	507	-2				89	-	88		78			91	91	94	90	98	87	82	-			-	-
<i>Serratia marcescens</i> [^]	108	-2				-	-	99	100	97		94	-	100	-	98	-	91	91	-	34	100		
<i>Stenotrophomonas maltophilia</i>	85	+1											-	-				-	91	100		93	-	-

Haemophilus influenzae (includes non-type b isolates) Isolates tested: 29 (Percent Susceptible)
 Ampicillin (66); Cefotaxime (100); Ciprofloxacin (100); Tetracycline (78); Trimethoprim/sulfamethoxazole (72);
 Chloramphenicol (93); Cefaclor (74); Cefixime (100); Clarithromycin (85); Rifampin (93)

- (-) Drug not tested or drug not indicated.
- Organism exhibits intrinsic resistance to this drug.
- 1. Enterobacteriales organisms susceptible to Cefotaxime are also susceptible to Ceftriaxone.
- 2. Combination of all *Acinetobacter species*.
- [^]See back cover for additional footnotes.

CUMULATIVE ANTIBIOGRAM: ALL LOCATIONS AND AGES --- 2021

Gram Positive Organisms % Susceptible	# Isolates tested 2021	% Change in Isolates tested from 2020	Penicillin	Ampicillin	Oxacillin	Cefotaxime	Meropenem	Clindamycin	Erythromycin	Vancomycin	Linezolid	Ciprofloxacin	Levofloxacin	Moxifloxacin	Gentamicin	High Level (synergy) Gentamicin	High level (synergy) Streptomycin	Rifampin	Tetracycline	Tigecycline	Trimethoprim / sulfamethoxazole	Nitrofurantoin [^]	# Isolates tested with Nitrofurantoin [^]	
Staphylococcus																								
Staphylococcus aureus (MSSA)	789	+13	17	-	100	-	-	80	66	100	100	88	90	90	100	-	-	100	95	100	98	100	61	
Staphylococcus aureus (MRSA) ³	566	-13	0	-	0	-	-	63	12	100	100	31	32	32	99	-	-	99	90	100	97	100	36	
Staphylococcus coagulase negative (CONS)	1270	-19	11	-	42	-	-	55	35	100	100	67	68	68	93	-	-	99	83	100	68	100	285	
Staphylococcus lugdunensis	49	-4	27	-	69	-	-	50	50	100	100	94	92	92	100	-	-	100	94	100	96	100	7	
Streptococcus																								
Alpha hemolytic streptococcus not pneumococcus or enterococcus	114	+19	63	-	-	95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Streptococcus pneumoniae ^{4,^} (blood/sterile sites by Etest)	9	+29	*	-	-	100	71	100	-	100	-	-	100	-	-	-	-	100	-	-	-	-	-	-
Streptococcus pneumoniae ^{4,^} (other specimen types; non-sterile)	49	-22	*	-	-	96	80	80	53	100	100	-	100	-	-	-	-	100	59	-	65	-	-	-
Streptococcus pyogenes (Group A)	35	-13	100	100	-	100	-	27	27	100	100	-	100	100	-	-	-	-	-	100	-	-	-	-
Streptococcus agalactiae (Group B)	693	-11	100	100	-	100	-	40	29	100	100	-	99	99	-	-	-	-	-	100	-	-	-	-
Enterococcus																								
Enterococcus species (all species)	1099	+10	84	85	-	-	-	13	84	99	65	67	-	-	-	76	81	-	23	100	-	-	81	605
Enterococcus faecium	183	+33	10	13	-	-	-	8	30	98	5	7	-	-	-	83	65	-	14	-	-	-	12	119
Enterococcus faecalis	866	+8	100	100	-	-	-	11	97	100	79	81	-	-	-	74	84	-	24	100	-	-	99	473

(-) Drug not tested or drug not indicated.

■ Organism exhibits intrinsic resistance to this drug.

3. 99% of MRSA had vancomycin MIC ≤ 1 ug/ml.

4. *Susceptibility of *Streptococcus pneumoniae* varies according to the type of therapy and infection site.

a) Meningitis with IV penicillin [≤ 0.06(S); ≥ 0.12ug/ml (R)]: No isolates from CSF were isolated in 2021.

b) Non-meningitis IV penicillin [≤ 2(S); 4(I); ≥ 8ug/ml]: 100% of isolates from sterile sites were susceptible in 2021.

c) Non-meningitis with oral penicillin [≤ 0.06(S); 0.12 to 1.0 (I); ≥ 2 ug/ml(R)]: 51% of isolates from non-sterile sites were susceptible in 2021. (MMWR 2008:57:1353 and Clinical Laboratory Standards Institute 2021, M100-ED31)

[^]See back cover for additional footnotes.

INTENSIVE CARE UNITS ANTIBIOGRAM: ICUA, ICUB, TSICU, ICUD, CVICU --- 2021

Gram Negative Organisms % Susceptible	# isolates tested 2021	% Change in Isolates tested from 2020	Ampicillin	Ampicillin / sulbactam	Amoxicillin / clavulanic acid	Piperacillin / tazobactam	Imipenem	Meropenem	Ertapenem	Aztreonam	Cefazolin	Cefotaxime/ Ceftriaxone 1	Ceftazidime	Cefepime	Amikacin	Gentamicin	Tobramycin	Ciprofloxacin	Levofloxacin	Minocycline	Tetracycline	Trimethoprim / Sulfamethoxazole	Nitrofurantoin^	# Isolates tested with Nitrofurantoin^
Acinetobacter species ²	20	-5		70		35	45	-			-	-	45	40	55	55	60	40	45	-	40	47	-	-
Enterobacter cloacae complex	21	-55				81	100	100	100	76		76	-	95	-	90	-	100	95	-	86	76	33	3
E. coli^	90	-37	50	-	82	94	100	100	100	81	55	79	-	88	-	90	-	61	60	-	74	61	97	39
Klebsiella aerogenes	13	-8				67	85	100	100	62		62	-	92	-	100	-	100	100	-	100	100	50	2
Klebsiella oxytoca^	21	+5		-	95	95	100	100	100	95	5	95	-	100	-	100	-	95	95	-	95	95	100	1
Klebsiella pneumoniae^	85	+6		-	83	85	93	95	94	84	54	83	-	93	-	96	-	86	79	-	76	85	19	16
Proteus mirabilis^	24	-23	42	-	100	100	17	100	100	96	25	63	-	67	-	88	-	25	29	-		46		
Pseudomonas aeruginosa	84	-11				81	-	67		71			88	82	89	78	98	77	73	-				
Serratia marcescens	13	-59				-	-	100	100	85		85	-	100	-	100	-	100	100	-	31	100		
Stenotrophomonas maltophilia	26	-4											-	-				-	81	100		96	-	-

(-) Drug not tested or drug not indicated.

■ Organism exhibits intrinsic resistance to this drug.

1. Enterobacterales organisms susceptible to Cefotaxime are also susceptible to Ceftriaxone.

2. Combination of all *Acinetobacter species*.

^See back cover for additional footnotes.

INTENSIVE CARE UNITS ANTIBIOGRAM: ICUA, ICUB, TSICU, ICUD, CVICU --- 2021

Gram Positive Organisms % Susceptible	# Isolates tested 2021	% Change in Isolates tested from 2020	Penicillin	Ampicillin	Oxacillin	Cefotaxime	Meropenem	Clindamycin	Erythromycin	Vancomycin	Linezolid	Ciprofloxacin	Levofloxacin	Moxifloxacin	Gentamicin	High Level (synergy) Gentamicin	High level (synergy) Streptomycin	Rifampin	Tetracycline	Tigecycline	Trimethoprim / sulfamethoxazole	Nitrofurantoin [^]	# Isolates tested with Nitrofurantoin [^]
Staphylococcus																							
Staphylococcus aureus (MSSA)	87	-29	18	-	100	-	-	79	65	100	100	95	95	95	99	-	-	100	97	100	99	100	2
Staphylococcus aureus (MRSA) ⁵	99	-28	0	-	0	-	-	45	8	100	100	24	24	24	100	-	-	100	89	100	97	-	-
Staphylococcus coagulase negative (CONS)	206	-31	10	-	27	-	-	48	29	100	100	48	49	48	92	-	-	99	80	100	56	100	6
Streptococcus																							
Alpha hemolytic streptococcus not pneumococcus or enterococcus	10	-34	50	-	-	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Streptococcus pneumoniae ^{6^} (blood/sterile sites by Etest)	2	+100	*	-	-	100	50	100	-	100	-	-	100	-	-	-	-	100	-	-	-	-	-
Streptococcus pneumoniae ^{6^} (other specimen types; non-sterile)	24	-17	*	-	-	100	93	74	48	100	100	-	100	-	-	-	-	100	52	-	70	-	-
Streptococcus agalactiae (Group B)	15	-7	100	100	-	100	-	73	45	100	100	-	100	100	-	-	-	-	-	100	-	-	-
Enterococcus																							
Enterococcus species (all species)	91	-34	76	77	-	-	-	-	11	71	100	38	38	-	-	71	69	-	12	100	-	82	34
Enterococcus faecium	22	-37	5	5	-	-	-	-	0	14	100	0	0	-	-	95	68	-	14	-	-	14	7
Enterococcus faecalis	65	-32	98	100	-	-	-	-	13	91	100	44	44	-	-	62	68	-	8	100	-	100	25

(-) Drug not tested or drug not indicated.

■ Organism exhibits intrinsic resistance to this drug.

5. 99% of MRSA had vancomycin MIC ≤ 1 ug/mL.

6. *Susceptibility of *Streptococcus pneumoniae* varies according to the type of therapy and infection site.

- Meningitis with IV penicillin [≤ 0.06 (S); ≥ 0.12ug/ml (R)]: No Isolates from CSF were isolated in 2021.
- Non-meningitis IV penicillin [≤ 2 (S); 4 (I)]; ≥ 8 ug/ml]: 100% of isolates from sterile sites were susceptible in 2021.
- Non-meningitis with oral penicillin [≤ 0.06 (S); 0.12 to 1.0 (I)]; ≥ 2 ug/ml(R)]: 46% of isolates from non-sterile sites were susceptible in 2021. (MMWR 2008:57:1353 and Clinical Laboratory Standards Institute 2021, M100-ED31)

[^]See back cover for additional footnotes.

PEDIATRIC ANTIBIOGRAM: NICU, PICU, Peds IMC, Peds --- 2020 - 2021

Gram Negative Organisms % Susceptible	# Isolates tested 2020 - 2021	% Change in Isolates tested from 2019 - 2020	# Isolates tested with																					
			Ampicillin	Ampicillin / sulbactam	Amoxicillin/ clavulanic acid	Piperacillin / tazobactam	Imipenem	Meropenem	Ertapenem	Aztreonam	Cefazolin	Cefotaxime/ ¹ Ceftriaxone	Ceftazidime	Cefepime	Amikacin	Gentamicin	Tobramycin	Ciprofloxacin	Levofloxacin	Minocycline	Tetracycline	Trimethoprim / Sulfamethoxazole	Nitrofurantoin [^]	# Isolates tested with Nitrofurantoin [^]
<i>Acinetobacter species</i> ²	15	-17		93		87	100	-			-	-	93	100	100	93	100	100	100	-	87	67	-	-
<i>Enterobacter cloacae</i> complex	27	-4				85	100	100	100	85		85	-	100	-	100	-	100	100	-	100	96	0	3
<i>E. coli</i> [^]	65	+5	63	-	89	100	100	100	100	100	67	98	-	98	-	95	-	83	83	-	83	85	100	27
<i>Klebsiella oxytoca</i> [^]	14	+56		-	86	93	100	100	100	93	8	93	-	100	-	93	-	93	93	-	86	100	100	4
<i>Klebsiella pneumoniae</i>	27	-40		-	100	100	100	100	100	100	35	100	-	100	-	100	-	100	100	-	93	100	100	2
<i>Proteus mirabilis</i>	10	-33	100	-	100	100	10	100	100	100	33	100	-	100	-	70	-	100	100	-		100		
<i>Pseudomonas aeruginosa</i>	37	-26				86	-	97		84			86	86	84	68	95	89	81	-			-	-
<i>Serratia marcescens</i>	23	-23						100	100	100		100	-	100	-	100	-	52	52	-	39	100		
<i>Stenotrophomonas maltophilia</i>	21	-34											-	-					95	100		95	-	-

Haemophilus influenzae (includes non-type b isolates) Isolates tested: 18 (Percent Susceptible)

Ampicillin (78); Cefotaxime (100); Ciprofloxacin (100); Tetracycline (76); Trimethoprim/sulfamethoxazole (67); Chloramphenicol (100); Cefaclor (71); Cefixime (100); Clarithromycin (71); Rifampin (94)

(-) Drug not tested or drug not indicated.

■ Organism exhibits intrinsic resistance to this drug.

1. Enterobacterales organisms susceptible to Cefotaxime are also susceptible to Ceftriaxone.
2. Combination of all *Acinetobacter species*.

[^]See back cover for additional footnotes.

PEDIATRIC ANTIBIOGRAM: NICU, PICU, Peds IMC, Peds --- 2020 - 2021

Gram Positive Organisms % Susceptible	# isolates tested 2020 - 2021	% Change in isolates tested from 2019 - 2020	Penicillin	Ampicillin	Oxacillin	Cefotaxime	Meropenem	Clindamycin	Erythromycin	Vancomycin	Linezolid	Ciprofloxacin	Levofloxacin	Moxifloxacin	Gentamicin	High Level (synergy) Gentamicin	High level, (synergy) Streptomycin	Rifampin	Tetracycline	Tigecycline	Trimethoprim / Sulfamethoxazole	Nitrofurantoin [^]	# isolates tested with Nitrofurantoin [^]
Staphylococcus																							
Staphylococcus aureus (MSSA)	91	-9	23	-	100	-	-	85	76	100	100	90	96	96	100	-	-	100	98	100	98	100	3
Staphylococcus aureus (MRSA) ⁷	36	-40	0	-	0	-	-	77	23	100	100	42	47	47	100	-	-	100	97	100	94	100	1
Staphylococcus coagulase negative (CONS)	94	-7	10	-	38	-	-	51	28	100	100	78	77	78	86	-	-	99	92	100	77	100	13
Streptococcus																							
Alpha hemolytic streptococcus not pneumococcus or enterococcus	17	+21	71	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Streptococcus pneumoniae ^{8,^} (blood/sterile sites by Etest)	1	0	*	-	-	100	100	100	-	100	-	-	100	-	-	-	-	100	-	-	-	-	-
Streptococcus pneumoniae ^{8,^} (other specimen types; non-sterile)	11	-27	*	-	-	100	-	91	73	100	100	-	100	-	-	-	-	100	91	-	91	-	-
Streptococcus agalactiae (Group B)	12	-37	100	100	-	100	-	20	20	100	100	-	100	100	-	-	-	-	-	100	-	-	-
Enterococcus																							
Enterococcus species (all species)	50	-32	96	96	-	-	-	-	16	96	100	83	86	-	-	84	82	-	50	100	-	83	6
Enterococcus faecium	5	0	60	60	-	-	-	-	0	80	100	0	0	-	-	80	80	-	0	-	-	0	1
Enterococcus faecalis	42	+37	100	100	-	-	-	-	11	100	100	100	100	-	-	83	81	-	60	100	-	100	5

(-) Drug not tested or drug not indicated.

■ Organism exhibits intrinsic resistance to this drug.

7. 100% of MRSA had vancomycin MIC \leq 1 ug/ml.

8. *Susceptibility of *Streptococcus pneumoniae* varies according to the type of therapy and infection site.

a) Meningitis with IV penicillin [\leq 0.06(S); \geq 0.12ug/ml (R)]: No isolates from CSF were isolated in 2020-2021.

b) Non-meningitis IV penicillin [\leq 2(S); 4(I); \geq 8ug/ml]: 100% of isolates from sterile sites were susceptible in 2020-2021.

c) Non-meningitis with oral penicillin [\leq 0.06(S); 0.12 to 1.0 (I); \geq 2 ug/ml(R)]: 91% of isolates from non-sterile sites were susceptible in 2020-2021. (MMWR 2008;57:1353 and Clinical Laboratory Standards Institute 2021, M100-ED31)

[^]See back cover for additional footnotes.

^Additional Information (all locations & all ages)

ESBL Rates, n/N (%)

	All hospital	ICU	Pediatrics
E. coli	159/2802 (5.5)	18/90 (20)	1/64 (2)
K. oxytoca	8/154 (5)	1/21 (5)	1/14 (7)
K. pneumoniae	45/781 (6)	7/85 (8)	-
P. mirabilis	15/329 (4.5)	7/24 (29)	-

CRE Rates, n/N (%)

	All hospital	ICU	Pediatrics
C. freundii	1/83 (1)	-	-
E. cloacae	3/220 (1.5)	-	-
E. coli	1/2802 (0.05)	-	-
K. pneumoniae	7/781 (1)	5/85 (6)	-
S. marcescens	1/108 (1)	-	-

Based on CDC definition of CRE (*Enterobacterales* resistant to any carbapenem)

^Additional Footnotes:

- Nitrofurantoin tested on urine isolates only
- For *Staphylococci* the susceptibility to oxacillin is the same as to 1st generation cephalosporins
- For *Streptococcus pneumoniae*:
 - Isolates susceptible to penicillin are considered susceptible to ertapenem, imipenem & meropenem.
 - Cefotaxime and meropenem were tested by Etest in penicillin non-susceptible isolates.
 - If penicillin S by disk diffusion, cefotaxime assumed S. If penicillin R by disk diffusion, cefotaxime tested by Etest.
 - CLSI has established two sets of *Streptococcus pneumoniae* breakpoints for cefotaxime or ceftriaxone.
 - Meningitis: [≤ 0.5 (S); 1.0 (I)]; ≥ 2 ug/ml (R)]
 - Non-meningitis: [≤ 1 (S); 2 (I)]; ≥ 4 ug/ml(R)]. (CLSI 2021, M100-ED31).

For questions, please call the Microbiology Laboratory at ext. 44135 or 814-4135.