



# UC Davis Health Antimicrobial Stewardship Program

Volume 4, Issue 2  
March 2022

The UC Davis Antimicrobial Stewardship Program (ASP) was first established in 1986 and then expanded in pediatrics in 2011 and hospital wide in 2013 in response to the growing challenge of antibiotic resistance. Due to increasing antibiotic resistance, patients are at a higher risk for adverse effects and poor outcomes and treatment strategies become more complex.

Antibiotics are life-saving drugs, and their use has important implications for patient care and public health. With this in mind, the UC Davis Health ASP strives to ensure all patients receive optimal antibiotic therapy when indicated. We thank you for your support in putting this very important program into action.

*Image: "Handprint on a large TSA plate from my 8 1/2-year-old son after playing outside." Submitted by: Tasha Sturm, Cabrillo College. Taken from [www.microbeworld.org](http://www.microbeworld.org).*

## In This Issue

- Diverticulitis: What You Need to Know
- 2021 UCD Antibiograms!
- Test Your Knowledge
- ASP Gold Star Winners for March 2022

## Diagnosis

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- Abdominal pain (usually left lower quadrant, ~90%), low-grade fever (~90%)
- Diagnostic testing: computed tomography (CT) scan of abdomen for diagnosis and complications (e.g., abscess, perforation)
- Microbiology: *Escherichia coli*, *Klebsiella pneumoniae*, *Bacteroides fragilis*;
  - *Staphylococcus aureus* is generally not a pathogen in intra-abdominal infections
- Blood cultures only for severe illness

## Treatment

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- **Acute, uncomplicated diverticulitis** (CT-confirmed left colonic disease without abscess, perforation, fistula; patient can have fever and/or elevated white blood cell count)
  - In patients with acute uncomplicated diverticulitis, trials suggest that antibiotics **do not** reduce time to improvement or prevent complications, and American Gastroenterological Association guidelines recommend selective rather than routine antibiotic use
  - Oral therapy (preferred if antibiotics are given): Amoxicillin-clav 875/125 mg PO q8h
  - Intravenous therapy: Ceftriaxone 1 g IV q24h + Metronidazole 500 mg IV q8h
- **Complicated diverticulitis** (CT-confirmed diverticulitis associated with abscess, fistula, obstruction, perforation, peritonitis) in a stable patient
  - Source control via percutaneous drain or operation when possible
  - Ceftriaxone 1 g IV q24h + Metronidazole 500 mg IV q8h
  - If penicillin allergic: Clindamycin 900 mg IV q8h + Aztreonam 1 g IV q8h
- **Diverticulitis in a severely ill patient**
  - Broader coverage for *Enterobacteriaceae spp.* and *Pseudomonas aeruginosa*
  - Piperacillin-tazobactam 4.5 g IV q6h + Vancomycin 1 g (dosed per pharmacy)
  - If penicillin allergic: discuss with your friendly ASP provider
- **Narrowing and oral therapy**
  - Narrow based on available culture data
  - Consider transition to oral therapy when patient shows clinical improvement (usually by 48–72 hours) and source control is achieved
  - Oral therapy: Amoxicillin-clavulanate 875/125 mg PO q8h
- **Surgical management**
  - Obtain immediate surgical consultation for presence of perforation, peritonitis, obstruction
  - Obtain surgical consultation during admission for failure of medical therapy, abscess (generally  $\geq 5$  cm) that cannot be drained percutaneously, fistula or stricture, recurrent episodes of diverticulitis

## Duration

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- Acute, uncomplicated: 4 days
- Complicated or initial severe illness with source control: 4 days after source control
- Complicated with small abscess not drained: 7–14 days depending on clinical response

## References

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# UC Davis 2021 AntibioGrams - ADULTS

## UCDH ANTIBIOGRAM

01/01/2021 - 12/31/2021

PERCENT OF ISOLATES SUSCEPTIBLE

Stuart Cohen, M.D.

Director, Clinical Microbiology Laboratory

### Inpatient ICU - Gram Negative Organisms

Category		Beta-lactams									Fluoroquinolones		Aminoglycosides			Other	
Organism	n	Ampicillin	Ampicillin/Sulbactam	Piperacillin/Tazobactam	Cefazolin	Ceftazidime	Ceftriaxone	Cefepime	Aztreonam	Meropenem	Ciprofloxacin	Levofloxacin	Amikacin	Gentamicin	Tobramycin	Trimethoprim/Sulfamethoxazole	Nitrofurantoin
breakpoints (mcg/mL)			8/4	16/4		8	8	8		2	1	2	16	4	4	2/38	
Acinetobacter baumannii complex	28 <sup>A</sup>	-	80	0	-	57	0	67	-	75	71	75	85	67	89	78	-
breakpoints (mcg/mL)		8	8/4	16/4	2	4	1	2	4	1	0.25	0.5	16	4	4	2/38	32
Enterobacter cloacae complex	38	0	2	78	0	78	72	92	78	100	100	100	100	100	100	97	16
Escherichia coli	95	43	51	92	60	81	77	81	79	98	68	70	100	84	81	63	100
Klebsiella aerogenes	19 <sup>A</sup>	0	0	68	0	68	68	100	68	100	94	94	100	100	100	100	0
Klebsiella pneumoniae	67	0	75	94	74	80	80	80	80	100	77	84	100	92	89	82	47
Proteus mirabilis	17 <sup>A</sup>	70	86	100	11	88	76	82	88	-	58	64	88	70	70	64	0
Serratia marcescens	24 <sup>A</sup>	0	0	95	0	93	87	91	95	100	75	86	100	91	70	-	0
breakpoints (mcg/mL)				16/4		8		8	8	2	0.5	1	16	4	4		
Pseudomonas aeruginosa	102	-	-	68	-	69	-	78	60	80	71	70	98	94	97	-	-
breakpoints (mcg/mL)						8						2				2/38	
Stenotrophomonas maltophilia	41	-	-	-	-	58	-	-	-	-	-	75	-	-	-	100	0

### Inpatient Non-ICU - Gram Negative Organisms

Category		Beta-lactams									Fluoroquinolones		Aminoglycosides			Other	
Organism	n	Ampicillin	Ampicillin/Sulbactam	Piperacillin/Tazobactam	Cefazolin	Ceftazidime	Ceftriaxone	Cefepime	Aztreonam	Meropenem	Ciprofloxacin	Levofloxacin	Amikacin	Gentamicin	Tobramycin	Trimethoprim/Sulfamethoxazole	Nitrofurantoin
breakpoints (mcg/mL)		8	8/4	16/4	2	4	1	2	4	1	0.25	0.5	16	4	4	2/38	32
Citrobacter freundii complex	13 <sup>A</sup>	0	0	76	0	61	61	100	61	100	84	84	100	100	92	92	100
Enterobacter cloacae complex	34	0	8	70	2	67	64	85	67	100	97	97	100	100	100	81	53
Escherichia coli	280	48	56	95	67	82	80	81	81	99	68	71	99	90	90	71	98
Klebsiella aerogenes	15 <sup>A</sup>	0	0	80	0	66	66	93	73	93	93	93	100	100	100	100	30
Klebsiella oxytoca	15 <sup>A</sup>	0	53	83	26	100	93	100	93	100	93	93	100	100	100	100	100
Klebsiella pneumoniae	87	0	61	89	77	86	85	86	86	100	79	81	100	88	88	78	32
Proteus mirabilis	44	79	84	97	15	97	93	97	100	100	72	75	100	84	79	81	0
Serratia marcescens	12 <sup>A</sup>	0	0	91	0	91	83	91	91	100	100	100	100	100	58	-	0
breakpoints (mcg/mL)				16/4		8		8	8	2	0.5	1	16	4	4		
Pseudomonas aeruginosa	112	-	-	90	-	88	-	92	81	91	83	83	99	94	98	-	-
breakpoints (mcg/mL)						8						2				2/38	
Stenotrophomonas maltophilia	28 <sup>A</sup>	-	-	-	-	53	-	-	-	-	-	82	-	-	-	96	-

## Outpatient / ED - Gram Negative Organisms

Category		Beta-lactams									Fluoroquinolones		Aminoglycosides			Other	
Organism	n	Ampicillin	Ampicillin/Sulbactam	Piperacillin/Tazobactam	Cefazolin	Ceftazidime	Ceftriaxone	Cefepime	Aztreonam	Meropenem	Ciprofloxacin	Levofloxacin	Amikacin	Gentamicin	Tobramycin	Trimethoprim/Sulfamethoxazole	Nitrofurantoin
breakpoints (mcg/mL)		8	8/4	16/4	2	4	1	2	4	1	0.25	0.5	16	4	4	2/38	32
Citrobacter freundii complex	57	0	0	92	0	84	84	98	84	100	94	94	100	92	92	84	94
Citrobacter koseri	63	0	94	98	90	95	96	98	98	100	96	98	100	100	100	96	38
Enterobacter cloacae complex	77	1	0	85	0	80	80	93	84	100	93	93	100	96	96	88	29
Escherichia coli	2694	63	69	98	83	94	93	94	94	100	80	82	100	93	93	80	98
Klebsiella aerogenes	54	0	0	90	0	88	88	98	88	100	92	94	100	100	100	98	34
Klebsiella oxytoca	71	0	51	91	35	94	91	94	90	100	92	97	100	95	95	91	89
Klebsiella pneumoniae	560	0	83	94	86	94	94	95	95	100	89	93	100	97	96	88	46
Morganella morganii	36	0	25	88	0	88	88	100	87	100	64	64	100	84	92	68	0
Proteus mirabilis	166	81	86	99	35	98	96	98	98	100	82	83	100	88	89	84	0
Serratia marcescens	38	0	0	100	0	100	87	100	100	100	76	84	100	97	81	100	0
breakpoints (mcg/mL)				16/4		8		8	8	2	0.5	1	16	4	4		
Pseudomonas aeruginosa	231	-	-	93	-	95	-	93	80	91	79	78	99	94	98	-	-
breakpoints (mcg/mL)						8						2				2/38	
Stenotrophomonas maltophilia	31	-	-	-	-	29	-	-	-	-	-	83	-	-	-	96	-

Data source: UCDH Laboratory Information Service, excluding duplicate, CF and surveillance isolates.

Breakpoints for susceptibility defined by Clinical Laboratory Standards Institute (CLSI M100 29th Edition, Jan 2019) .

Breakpoint values in red are values that are different from the 2019 AntibioGram which was based on CLSI M100 28th Ed, Jan 2018.

Organisms with a total number of less than 10 isolates recovered for the year are not included in this report.

≥10% increase in % of susceptible isolates compared to 2019

≥10% decrease in % susceptible isolates compared to 2019

### Footnote

<sup>A</sup> Calculated from fewer than the standard recommendation of 30 isolates. Interpret with caution.

## Adult GNR Summary...

- *Pseudomonas* resistance is increasing, particularly in our ICUs and particularly to meropenem and piperacillin-tazobactam
  - Cefepime remains as likely to be active as both these agents
  - Amikacin remains the most consistent anti-GNR antibiotic
- With the revised fluoroquinolone MICs for *Pseudomonas* and the *Enterobacterales*, fluoroquinolone resistance is now more evident
- The majority of outpatient and ED isolates (those with community-onset disease) are *E coli* which remains susceptible to ceftriaxone in the majority of instances (i.e. no risk factors for resistance)



**Inpatient ICU - Gram Positive Organisms**

Category		Beta Lactams				Macrolide Linco- samide	Fluor oquin olone	Tetra cyclines		Aminoglycosides			Other					
Organism	n	Penicillin G	Ampicillin	Oxadillin <sup>B</sup>	Cefazolin	Erythromycin	Clindamycin	Levofloxacin	Tetracycline	Minocycline	Gentamicin	Gent, High Level	Strep, High Level	Daptomycin	Linezolid	Rifampin	Trimethoprim/ Sulfamethoxazole	Vancomycin <sup>C</sup>
breakpoints (mcg/mL) Staph spp				2 <sup>B</sup>	8	0.5	0.5	1	4	4	4			1	4	1	2/38	2 <sup>C</sup>
Staphylococcus aureus, all	163	-	-	58	58	50	74	62	94	100	94	-	-	100	100	99	98	100
Staphylococcus aureus, MSSA	98	-	-	100	100	77	85	92	96	100	100	-	-	100	100	100	98	100
Staphylococcus aureus, MRSA	70	-	-	0	0	12	61	19	92	100	87	-	-	100	100	98	97	100
Coagulase Neg Staphylococci	13 <sup>A</sup>	-	-	23	23	33	41	100	100	100	55	-	-	100	100	92	-	100
breakpoints (mcg/mL) Enterococcus spp		8	8			0.5		2	4	4	S	S	4	2				4
Enterococcus species, all	68	77	77	-	-	17	-	76	24	26	-	86	79	97	100	-	-	76
Enterococcus faecalis	50	100	100	-	-	14	-	90	17	17	-	84	79	100	100	-	-	96
Enterococcus faecium	17 <sup>A</sup>	5	5	-	-	14	-	18	27	50	-	94	76	88	100	-	-	17

**Inpatient Non-ICU - Gram Positive Organisms**

Category		Beta Lactams				Macrolide Linco- samide	Fluor oquin olone	Tetra cyclines		Aminoglycosides			Other					
Organism	n	Penicillin G	Ampicillin	Oxadillin <sup>B</sup>	Cefazolin	Erythromycin	Clindamycin	Levofloxacin	Tetracycline	Minocycline	Gentamicin	Gent, High Level	Strep, High Level	Daptomycin	Linezolid	Rifampin	Trimethoprim/ Sulfamethoxazole	Vancomycin <sup>C</sup>
breakpoints (mcg/mL) Staph spp				2 <sup>B</sup>	8	0.5	0.5	1	4	4	4			1	4	1	2/38	2 <sup>C</sup>
Staphylococcus aureus, all	198	-	-	63	63	52	75	68	82	97	89	-	-	100	100	98	98	100
Staphylococcus aureus, MSSA	125	-	-	100	100	73	80	86	93	98	95	-	-	100	100	98	99	100
Staphylococcus aureus, MRSA	74	-	-	0	0	16	67	39	66	96	78	-	-	100	100	100	97	100
Coagulase Neg Staphylococci	45	-	-	48	48	40	64	75	89	100	81	-	-	100	100	100	-	100
breakpoints (mcg/mL) Enterococcus spp		8	8			0.5		2	4	4	S	S	4	2				4
Enterococcus species, all	154	68	70	-	-	14	-	64	37	44	-	87	65	98	97	-	-	75
Enterococcus faecalis	96	98	100	-	-	16	-	83	36	39	-	80	78	100	100	-	-	97
Enterococcus faecium	55	16	18	-	-	9	-	22	40	47	-	98	43	96	90	-	-	40

## Outpatient / ED - Gram Positive Organisms

Category		Beta Lactams				Macrolide Linco- samide	Fluor oquin olone	Tetra cyclines		Aminoglycosides			Other					
Organism	n	Penicillin G	Ampicillin	Oxacillin <sup>B</sup>	Cefazolin	Erythromycin	Clindamycin	Levofloxacin	Tetracycline	Minocycline	Gentamicin	Gent, High Level	Strep, High Level	Daptomycin	Linezolid	Rifampin	Trimethoprim/ Sulfamethoxazole	Vancomycin <sup>C</sup>
breakpoints (mcg/mL) Staph spp				2 <sup>B</sup>	8	0.5	0.5	1	4	4	4			1	4	1	2/38	2 <sup>C</sup>
Staphylococcus aureus, all	563	-	-	75	75	58	75	74	89	97	94	-	-	100	100	98	99	100
Staphylococcus aureus, MSSA	430	-	-	99	99	72	79	90	93	97	97	-	-	100	100	98	98	100
Staphylococcus aureus, MRSA	138	-	-	0	0	12	63	25	74	96	86	-	-	100	100	99	100	100
Coagulase Neg Staphylococci	83	-	-	86	86	74	87	89	91	98	95	-	-	100	100	100	-	100
breakpoints (mcg/mL) Enterococcus spp		8	8			0.5		2	4	4		S	S	4	2			4
Enterococcus species, all	320	94	96	-	-	20	-	88	29	32	-	90	86	99	99	-	-	97
Enterococcus faecalis	296	99	100	-	-	16	-	91	27	30	-	89	88	99	99	-	-	99
Enterococcus faecium	23 <sup>A</sup>	39	43	-	-	50	-	47	47	56	-	100	56	95	100	-	-	73

Data source: UCDH Laboratory Information Service, excluding duplicate, CF and surveillance isolates.

Breakpoints for susceptibility defined by Clinical Laboratory Standards Institute (CLSI M100 29th Edition, Jan 2019) .

Organisms with a total number of less than 10 isolates recovered for the year are not included in this report.

≥10% increase in % of susceptible isolates compared to 2019

≥10% decrease in % of susceptible isolates compared to 2019

### Footnotes:

<sup>A</sup> Calculated from fewer than the standard recommendation of 30 isolates. Interpret with caution.

<sup>B</sup> *S. aureus* and *S. lugdunensis* oxacillin breakpoint = 2 mcg/mL;

other coagulase-negative staphylococci breakpoint = 0.25 mcg/mL.

<sup>C</sup> Coagulase-negative staphylococci vancomycin breakpoint = 4 mcg/mL.

## Adult GPC Summary...

- *Staph aureus* resistance rates are stable. For empiric therapy of non-severe disease clindamycin remains a relatively poor choice given continued resistance. Consider doxycycline or trimethoprim-sulfamethoxazole instead.
- *Enterococcus* resistance rates are stable with a slight down trend in the frequency of isolation of *E. faecium* and VRE
  - The Enterococci as always are considered resistant to the cephalosporins, clindamycin, & trimethoprim-sulfamethoxazole
  - Almost all *E. faecalis* isolates remain ampicillin susceptible which remains the drug of choice

# UC Davis 2021 AntibioGrams - PEDIATRICS

## UCDH ANTIBIOGRAM

01/01/2021 - 12/31/2021

### PERCENT OF ISOLATES SUSCEPTIBLE

Stuart Cohen, M.D.

Director, Clinical Microbiology Laboratory

### PEDIATRIC Inpatient ICU - Gram Negative Organisms

Category		Beta-lactams									Fluoroquinolones		Aminoglycosides			Other	
Organism	n	Ampicillin	Ampicillin/Sulbactam	Piperacillin/Tazobactam	Cefazolin	Ceftazidime	Ceftriaxone	Cefepime	Aztreonam	Meropenem	Ciprofloxacin	Levofloxacin	Amikacin	Gentamicin	Tobramycin	Trimethoprim/Sulfamethoxazole	Nitrofurantoin
breakpoints (mcg/mL)		8	8/4	16/4	2	4	1	2	4	1	0.25	0.5	16	4	4	2/38	32
Enterobacter cloacae complex	12 <sup>A</sup>	0	18	91	0	91	91	100	91	100	100	100	100	100	100	100	25
Escherichia coli	39	46	55	92	60	87	79	84	82	100	71	74	100	79	87	61	95
Klebsiella oxytoca	12 <sup>A</sup>	0	22	91	33	100	100	100	91	100	100	100	100	100	100	100	100
Klebsiella pneumoniae	18 <sup>A</sup>	0	80	100	83	88	83	83	83	100	83	88	100	83	83	66	50
Serratia marcescens	22 <sup>A</sup>	0	0	100	0	100	100	100	100	100	100	100	100	100	81	-	0
breakpoints (mcg/mL)				16/4		8		8	8	2	0.5	1	16	4	4		
Pseudomonas aeruginosa	30	-	-	83	-	90	-	86	70	96	86	86	100	96	100	-	-
breakpoints (mcg/mL)						8						2				2/38	
Stenotrophomonas maltophilia	12 <sup>A</sup>	-	-	-	-	66	-	-	-	-	-	91	-	-	-	100	-

### PEDIATRIC Inpatient Non-ICU - Gram Negative Organisms

Category		Beta-lactams									Fluoroquinolones		Aminoglycosides			Other	
Organism	n	Ampicillin	Ampicillin/Sulbactam	Piperacillin/Tazobactam	Cefazolin	Ceftazidime	Ceftriaxone	Cefepime	Aztreonam	Meropenem	Ciprofloxacin	Levofloxacin	Amikacin	Gentamicin	Tobramycin	Trimethoprim/Sulfamethoxazole	Nitrofurantoin
breakpoints (mcg/mL)		8	8/4	16/4	2	4	1	2	4	1	0.25	0.5	16	4	4	2/38	32
Escherichia coli	39	51	63	92	74	89	87	89	87	100	69	74	100	74	82	63	100
Klebsiella oxytoca	10 <sup>A</sup>	0	12	90	20	100	100	100	90	100	100	100	100	100	100	100	100
Klebsiella pneumoniae	11 <sup>A</sup>	0	90	100	90	90	90	90	90	100	100	100	100	100	100	90	50
Serratia marcescens	11 <sup>A</sup>	0	0	100	0	100	100	100	100	100	100	100	100	100	90	-	0
breakpoints (mcg/mL)				16/4		8		8	8	2	0.5	1	16	4	4		
Pseudomonas aeruginosa	10 <sup>A</sup>	-	-	80	-	80	-	90	90	90	90	90	100	100	100	-	-



**PEDIATRIC Outpatient / ED - Gram Negative Organisms**

Category		Beta-lactams									Fluoro quino lones		Amino glycosides			Other	
Organism	n	Ampicillin	Ampicillin/ Sulbactam	Piperacillin/ Tazobactam	Cefazolin	Ceftazidime	Ceftriaxone	Cefepime	Aztreonam	Meropenem	Ciprofloxacin	Levofloxacin	Amikacin	Gentamicin	Tobramycin	Trimethoprim/ Sulfamethoxazole	Nitrofurantoin
breakpoints (mcg/mL)		8	8/4	16/4	2	4	1	2	4	1	0.25	0.5	16	4	4	2/38	32
Escherichia coli	113	64	72	100	84	94	93	93	93	100	87	89	100	92	92	79	98
Klebsiella pneumoniae	13 <sup>A</sup>	0	66	84	76	76	76	92	76	100	76	92	100	92	92	84	38
Proteus mirabilis	5 <sup>A</sup>	80	100	100	60	100	100	100	100	-	100	100	100	100	100	100	0
breakpoints (mcg/mL)				16/4		8		8	8	2	0.5	1	16	4	4		
Pseudomonas aeruginosa	21 <sup>A</sup>	-	-	95	-	95	-	95	95	100	85	85	100	95	100	-	-

Data source: UCDH Laboratory Information Service, excluding duplicate, CF and surveillance isolates.

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≥10% increase in % of susceptible isolates compared to 2019

≥10% decrease in % susceptible isolates compared to 2019

**Footnote**

A Calculated from fewer than the standard recommendation of 30 isolates. Interpret with caution.

**Pediatric GNR Summary...**

- The majority of outpatient and ED isolates (those with community-onset disease) are *E coli* which remains susceptible to ceftriaxone in the majority of instances (i.e. no risk factors for resistance)
- The number of isolates for most organisms is small so should be interpreted with caution and in context of the individual patient given limited data

## UCDH ANTIBIOGRAM

01/01/2021 - 12/31/2021

## PERCENT OF ISOLATES SUSCEPTIBLE

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## PEDIATRIC Inpatient ICU - Gram Positive Organisms

Category		Beta Lactams				Macrolide Linco- samide	Fluor oquin olone	Tetra cyclines		Aminoglycosides			Other					
Organism	n	Penicillin G	Ampicillin	Oxacillin <sup>B</sup>	Cefazolin	Erythromycin	Clindamycin	Levofloxacin	Tetracycline	Minocycline	Gentamicin	Gent, High Level	Strep, High Level	Daptomycin	Linezolid	Rifampin	Trimethoprim/ Sulfamethoxazole	Vancomycin <sup>C</sup>
breakpoints (mcg/mL) Staph spp				2 <sup>B</sup>	8	0.5	0.5	1	4	4	4			1	4	1	2/38	2 <sup>C</sup>
Staphylococcus aureus, all	42	-	-	80	80	59	78	87	96	100	100	-	-	100	100	100	97	100
Staphylococcus aureus, MSSA	34	-	-	100	100	73	79	92	100	100	100	-	-	100	100	100	97	100
Staphylococcus aureus, MRSA	8 <sup>A</sup>	-	-	0	0	0	75	50	75	100	100	-	-	100	100	100	100	100
Coagulase Neg Staphylococci	12 <sup>A</sup>	-	-	8	8	0	10	66	100	100	40	-	-	100	100	100	-	100
breakpoints (mcg/mL) Enterococcus spp		8	8			0.5		2	4	4		S	S	4	2			4
Enterococcus species, all	26 <sup>A</sup>	100	100	-	-	0	-	100	20	20	-	80	80	100	100	-	-	100
Enterococcus faecalis	25 <sup>A</sup>	100	100	-	-	0	-	100	20	20	-	80	80	100	100	-	-	100
Enterococcus faecium	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

## PEDIATRIC Inpatient Non-ICU - Gram Positive Organisms

Category		Beta Lactams				Macrolide Linco- samide	Fluor oquin olone	Tetra cyclines		Aminoglycosides			Other					
Organism	n	Penicillin G	Ampicillin	Oxacillin <sup>B</sup>	Cefazolin	Erythromycin	Clindamycin	Levofloxacin	Tetracycline	Minocycline	Gentamicin	Gent, High Level	Strep, High Level	Daptomycin	Linezolid	Rifampin	Trimethoprim/ Sulfamethoxazole	Vancomycin <sup>C</sup>
breakpoints (mcg/mL) Staph spp				2 <sup>B</sup>	8	0.5	0.5	1	4	4	4			1	4	1	2/38	2 <sup>C</sup>
Staphylococcus aureus, all	29 <sup>A</sup>	-	-	75	75	58	86	84	88	100	100	-	-	100	100	100	100	100
Staphylococcus aureus, MSSA	22 <sup>A</sup>	-	-	100	100	68	90	95	90	100	100	-	-	100	100	100	100	100
Staphylococcus aureus, MRSA	7 <sup>A</sup>	-	-	0	0	28	71	40	80	100	100	-	-	100	100	100	100	100
Coagulase Neg Staphylococci	9 <sup>A</sup>	-	-	55	62	33	44	-	-	-	77	-	-	100	100	100	-	100
breakpoints (mcg/mL) Enterococcus spp		8	8			0.5		2	4	4		S	S	4	2			4
Enterococcus species, all	13 <sup>A</sup>	92	92	-	-	66	-	72	66	66	-	84	92	100	92	-	-	84
Enterococcus faecalis	11 <sup>A</sup>	100	100	-	-	100	-	80	70	70	-	81	100	100	100	-	-	100
Enterococcus faecium	1 <sup>A</sup>	0	0	-	-	0	-	0	0	0	-	100	0	100	100	-	-	0

## PEDIATRIC Outpatient / ED - Gram Positive Organisms

Category		Beta Lactams				Macrolide Linco- samide	Fluor oquin olone	Tetra cyclines		Aminoglycosides			Other					
Organism	n	Penicillin G	Ampicillin	Oxacillin <sup>B</sup>	Cefazolin	Erythromycin	Clindamycin	Levofloxacin	Tetracycline	Minocycline	Gentamicin	Gent, High Level	Strep, High Level	Daptomycin	Linezolid	Rifampin	Trimethoprim/ Sulfamethoxazole	Vancomycin <sup>C</sup>
breakpoints (mcg/mL) Staph spp				2 <sup>B</sup>	8	0.5	0.5	1	4	4	4			1	4	1	2/38	2 <sup>C</sup>
Staphylococcus aureus, all	237	-	-	89	89	68	81	85	97	98	96	-	-	100	100	99	99	100
Staphylococcus aureus, MSSA	213	-	-	100	100	75	82	93	97	98	97	-	-	100	100	100	100	100
Staphylococcus aureus, MRSA	46	-	-	0	0	12	71	18	93	100	84	-	-	100	100	96	96	100
Coagulase Neg Staphylococci	8 <sup>A</sup>	-	-	100	100	75	87	100	100	100	100	-	-	100	100	100	-	100
breakpoints (mcg/mL) Enterococcus spp		8	8			0.5		2	4	4		S	S	4	2			4
Enterococcus species, all	15 <sup>A</sup>	93	93	-	-	0	-	86	26	26	-	86	86	100	100	-	-	93
Enterococcus faecalis	14 <sup>A</sup>	100	100	-	-	0	-	92	28	28	-	85	92	100	100	-	-	100
Enterococcus faecium	1 <sup>A</sup>	0	0	-	-	0	-	0	0	0	-	100	0	100	100	-	-	0

Data source: UCDH Laboratory Information Service, excluding duplicate, CF and surveillance isolates.

Breakpoints for susceptibility defined by Clinical Laboratory Standards Institute (CLSI M100 29th Edition, Jan 2019) .

Organisms with a total number of less than 10 isolates recovered for the year are not included in this report with some exceptions.

≥10% increase in % of susceptible isolates compared to 2019

≥10% decrease in % of susceptible isolates compared to 2019

### Footnotes:

<sup>A</sup> Calculated from fewer than the standard recommendation of 30 isolates. Interpret with caution.

<sup>B</sup> *S. aureus* and *S. lugdunensis* oxacillin breakpoint = 2 mcg/mL;  
other coagulase-negative staphylococci breakpoint = 0.25 mcg/mL.

<sup>C</sup> Coagulase-negative staphylococci vancomycin breakpoint = 4 mcg/mL.

## Pediatric GPC Summary...

- *Staph aureus* resistance rates are stable. Please note that 28% of MRSA isolates and 17% of MSSA isolates are resistant to clindamycin. Alternative medications include vancomycin, trimethoprim-sulfa, linezolid, and doxycycline (if age ≥ 8 years). All MSSA isolates are susceptible to 1<sup>st</sup> gen cephalosporins, such as cephalexin or cefazolin.
- *Enterococcus* resistance rates are stable with a down trend in the frequency of isolation of *E. faecium* and no VRE in 2021.
  - The Enterococci as always are considered resistant to the cephalosporins, clindamycin, & trimethoprim-sulfamethoxazole
  - Almost all *E. faecalis* isolates remain ampicillin susceptible which remains the drug of choice

## Test Your Knowledge

Would you like to win a \$10 gift certificate to the Sunshine Café? Complete the following post-newsletter quiz and submit to [hs-ASP@ucdavis.edu](mailto:hs-ASP@ucdavis.edu) to be entered into a raffle for a free lunch!

A 50-year-old man presents to the ED with chest pain and is admitted for unstable angina. A few days into his admission he develops 3 out of 10 poorly localizing abdominal pain and nausea for which he undergoes CT imaging of his abdomen and pelvis. Diverticulitis is noted by the radiologist without further comment. He is otherwise stable and afebrile though his WBC count trended up from 8.5 to 10 this morning. He is started on IV antibiotics.

1. Which antibiotic regimen would be most appropriate?
  - a. Ceftriaxone 1 g IV q24h + metronidazole 500 mg IV q8h
  - b. Vancomycin 1 g IV dosed by pharm + ceftriaxone 1 g IV q24h + metronidazole 500 mg IV q8h
  - c. Meropenem 1 g IV q8h
  - d. Levofloxacin 750 mg IV q24h + metronidazole 500 mg IV q8h
2. True or False: The patient's nurse asks whether the patient needed to have been treated with antibiotics at all. Given the patient's stability, mild illness, and absence of diverticulitis complications he could have been safely observed without any antibiotic interventions.
3. The patient rapidly improves, and he is ready for discharge by the next hospital day. He has tolerated his antibiotics and is now tolerating a full cardiac diet without event. Which regimen would be best to complete his antibiotic treatment for his diverticulitis?
  - a. Continue his intravenous antibiotics, place a PICC line, complete 7-day total course
  - b. Levofloxacin 750 mg PO q24h + metronidazole 500 mg PO q8h, complete 7-day total course
  - c. Amoxicillin-clavulanate 875/125 mg PO q8h, complete 4-day total course
  - d. Stop all antibiotics and wish him well
4. To which oral anti-MRSA antibiotic are MRSA isolates at UCD most frequently resistant to?
  - a. Linezolid
  - b. Doxycycline
  - c. Trimethoprim-sulfamethoxazole
  - d. Clindamycin

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## ASP Gold Star Winners for March 2022



The following staff have been recognized by the ASP team for their dedication to combatting antimicrobial resistance and commitment to the principles of antimicrobial stewardship:

- Noah Canvasser (Urology)
- Daniel Neudorf (PMR)

### Fun Microbe Fact:

Per the “biodiversity hypothesis,” reduced contact with environmental biodiversity may adversely affect human commensal microbiota and its immunomodulatory capacity. A study conducted among kids showed that compared with healthy children, atopic kids had lower biodiversity in the surroundings of their homes and significantly lower diversity of gammaproteobacteria on their skin.

## Contact Us

The Antimicrobial Stewardship Program team members

### Adult ASP Physicians:

Stuart Cohen, MD  
Archana Maniar, MD  
Sarah Waldman, MD  
Scott Crabtree, MD  
Natascha Tuznik, DO  
Christian Sandrock, MD  
Larissa May, MD  
Angel Desai, MD  
Naomi Hauser, MD  
Alan Koff, MBBS

### Pediatric ASP Physicians:

Natasha Nakra, MD  
Jean Wiedeman, MD  
Ritu Cheema, MD  
Elizabeth Partridge, MD

### ASP Pharmacists:

Monica Donnelley, PharmD  
Nicola Clayton, PharmD  
Jen Curello, PharmD  
James Go, PharmD

**Antibiotic questions? Contact us.**

**See the On-Call Schedule for the ASP attending/fellow of the day**

**Contact the ASP Pharmacist at 916-703-4099 or by Vocera "Infectious Disease Pharmacist"**