

Only add vancomycin if MRSA coverage is warranted due to previous respiratory isolation or at risk for MRSA infection or recent hospitalization

Antimicrobials Restrictions Policy

Restriction of the use of certain antimicrobial agents based on indication, spectrum of activity, potential for serious adverse effects, or associated toxicities can ensure appropriate use of therapy. By ensuring the appropriate use, the emergence of multi-resistant organisms may be minimized while achieving therapeutic goals and reducing healthcare costs.

See the policy for details on restriction criteria for the following:

- Piperacillin/tazobactam
- Fluoroquinolones
- Ertapenem (Invanz)
- Meropenem (Merrem)
- Daptomycin (Cubicin)
- Linezolid (Zyvox)
- Ceftaroline (Teflaro)
- Ceftazidime/avibactam
- Ceftolozane/tazobactam
- Aztreonam
- Colistimethate (Colistin)
- Fidaxomicin
- Voriconazole
- Isavuconazole
- Posaconazole
- Micafungin

Pre-Op Antimicrobial Prophylaxis Recommendations

SURGERY TYPE	FIRST CHOICE	ALTERNATIVE
Cardiac, Non-cardiac Thoracic, Vascular	Cefazolin* + Vancomycin 15mg/kg**	Vancomycin 15mg/kg
Neurosurgical	Cefazolin* + Vancomycin 15mg/kg**	Vancomycin 15mg/kg
Orthopedic	Cefazolin* + Vancomycin 15mg/kg**	Vancomycin 15mg/kg
Head and Neck	Cefazolin* + Metronidazole	Clindamycin
Gastroduodenal, Esophageal, Hernia Repair, PEG Placement	Cefazolin* + Vancomycin 15mg/kg**	Vancomycin 15mg/kg + Gentamicin
Colon and Abdominal/ General	Cefazolin* + Metronidazole OR Cefazolin*	Levofloxacin + Metronidazole OR Vancomycin 15mg/kg
Gynecological	Cefazolin*	Clindamycin + Gentamicin
Urological	Cefazolin* OR Cefazolin* + Metronidazole OR Cefazolin* + Gentamicin	Levofloxacin OR Vancomycin 15mg/kg ± Gentamicin

*Recommended dose is 2 grams in adult patients (3 grams ≥ 120 kg)
** If known MRSA colonization

Risk Factors for MRSA Infection

HOSPITAL SETTING	COMMUNITY SETTING
Recent antibiotic exposure	History of skin trauma
Hemodialysis/Peritoneal Dialysis	Poor personal hygiene
Indwelling vascular catheter	Illicit IV drug use
Diabetes mellitus	Exposure to crowded environments (prisons, day care centers and military quarters)
Immune system dysfunction	
Recent surgical procedures	
Recent infection/colonization with MRSA	

Shorter Duration of Antibiotic Therapy

INFECTION	OLD	NEW
Community Acquired Pneumonia	7 to 14 Days	5 Days
Ventilator Associated Pneumonia	10 to 15 Days	≤ 8 Days
Pyelonephritis	10 to 14 Days	5 to 7 Days
Intra-abdominal Infection	10 Days	4 Days
Cellulitis	10 Days	5 Days
Acute Bacterial Sinusitis	10 Days	5 Days
Acute Exacerbation of Chronic Bronchitis and COPD	≥ 7 Days	≤ 5 Days
Neutropenic Fever	Until ANC > 500	Afebrile x 72 hours

Verigene Resistance Markers

ORGANISMS	RESISTANCE GENE	INTERPRETATION
Staphylococcus aureus OR S. epidermidis	None	None
	MecA	Methicillin Resistance
Enterococcus faecalis OR E. faecium	None	None
	Van A or Van B	Vancomycin Resistance
Escherichia coli, Klebsiella pneumoniae, Klebsiella oxytoca	None	None
	CTX-M	ESBL Producing Organism
	KPC, NDM, OXA or VIM	CRE/MDR Organism*
Proteus species OR Enterobacter species	None	None
	CTX-M	ESBL Producing Organism
Pseudomonas aeruginosa	None	None
	IMP, KPC, NDM, OXA or VIM	CRPA/MDR Organism*
Acinetobacter species	None	None
	IMP or OXA	CRAB/MDR Organism*
Enterobacter species	None	None
	CTX-M	ESBL Producing Organism
	IMP, KPC, NDM or VIM	CRE/MDR Organism*

*ID Consult Recommended

Antimicrobial Guideline

Approved by the Antimicrobial Stewardship Committee
& Infection Control Committee

2024 Recommended Empiric Antimicrobial Therapy of Selected Infections in Adults Requiring Hospitalization

INFECTION	1ST LINE	ALTERNATIVE / ALLERGY
Community Acquired Pneumonia	Ceftriaxone + Azithromycin	Levofloxacin*
UTI, Uncomplicated	Nitrofurantoin**	Cephalexin
UTI, Complicated	Ceftriaxone	Ciprofloxacin*
Sepsis of Unknown Etiology	Cefepime ± Vancomycin	Levofloxacin* ± Vancomycin
Intra-Abdominal Sepsis	Ceftriaxone + Metronidazole	Ciprofloxacin* + Metronidazole
Suspected or confirmed C. difficile infection	Vancomycin PO	Fidaxomicin*
Bacterial Meningitis	Ceftriaxone + Vancomycin ± Ampicillin	Ceftriaxone + Vancomycin ± Bactrim
Health Care Associated Meningitis	Cefepime + Vancomycin ± Ampicillin	Meropenem* + Vancomycin
Pelvic Inflammatory Disease	Cefoxitin + Doxycycline	Clindamycin + Gentamicin
Cellulitis	Ceftriaxone ± Clindamycin	Vancomycin OR Clindamycin
Cellulitis, Complicated OR Diabetic Foot Ulcer	Ceftazidime ± Clindamycin OR Metronidazole	Ciprofloxacin* ± Vancomycin
Febrile Neutropenia (ANC < 500) based on source and MRSA risk	Cefepime ± Metronidazole ± Vancomycin	Aztreonam* ± Metronidazole ± Vancomycin

* Restrictions for use may apply

** Avoid use in geriatric patients and CrCl less than 30 mL/min

Only add vancomycin if MRSA coverage is warranted due to previous isolation of MRSA, at risk for MRSA infection or recent hospitalization

Ensuring patients receive the right antibiotic, at the right dose, at the right time, and for the right duration reduces mortality, risk of Clostridium difficile-associated diarrhea, hospital stays, overall antimicrobial resistance within the facility, and costs.

St. Joseph's Medical Center - Stockton

Antibiogram 01/01/2023- 12/31/2023

Percent (%) susceptible	# Tested (n)	Penicillins							Cephalosporins					Carbapenems			Aminoglycosides			Fluoroquinolones		Other									
		Ampicillin	Amoxicillin	Oxacillin	Penicillin	Piperacillin/Tazo	Ticarcillin	Ticar/Clav Acid	Amp/Sublactam	Cefazolin	Cefepime	Cefotaxime	Ceftazidime	Ceftriaxone	Ertapenem	Imipenem	Meropenem	Amikacin	Gentamicin	Tobramycin	Ciprofloxacin	Levofloxacin	Clindamycin	Erythromycin	Linezolid	Rifampin	Trimeth/Sulfa	Daptomycin	Tetracycline	Vancomycin	Nitrofurantoin*
Gram negative rods:																															
Acinetobacter baumannii	89				30		27	47		31	28	36	19		43	36	60	57	60	33	30						39		35		
Citrobacter freundii	74	0						0	0	97		73	73	99	100		100	99	99	93	94										92
Citrobacter koseri	43	0			100				91	100		93	93	100	100		100	100	98	98	98										90
Enterobacter cloacae	198	0			44			0	0	90		74	75	89	94		99	93	91	87	89						81				42
Escherichia coli	3244	46			95			58	74	80		79	80	100	100		99	87	85	71	71						70				97
Klebsiella aerogenes	89	0						0	0	96		76	80	99	98		100	100	100	98	98						93				11
Klebsiella oxytoca	112	0							75	74	91	91	91	100	100		99	95	92	94	95						90				94
Klebsiella pneumoniae	798	0			88			71	76	77		77	77	96	96		96	88	84	83	86						77				31
Morganella morganii	124	0			95			10	0	98		84	93	99	87		100	81	89	72	73						63				0
Proteus mirabilis	630	71			100			84	78	86		85	84	100			98	85	88	68	70						73				0
Providencia rettgeri	42	0			93			64	0	93		95	98		95		100	98	100	98	98										
Providencia stuartii	58	0			98			12	0	95		93	91		98		100	0	0	36	28										
Pseudomonas aeruginosa	683				84	72				88		85			84	88	97	23	25	81	75										
Serratia marcescens	103	0			90			1	0	99		93	93	100			100	100	96	96	97										0
Stenotrophomonas maltophilia	101																										96				
Gram positive cocci:																															
Enterococcus faecalis	958	99																		*72	*73			100				100		89	99
Enterococcus faecium	211	69																		*11	*10			100						48	61
Staphylococcus aureus	1157			51														88		57	58	65	42	100	99	95	99	75	100	98	
Staphylococcus epidermidis	191			38															90	70	70	55	27	99	97			73	100	100	
Staphylococcus lugdunensis	43			86																98	98	75	76		100			88	100		
Streptococcus agalactiae	30	100			100					100	100		100										63	47							100
Streptococcus mitis/oralis	44	84			77					95	100		100										98	49							100
Streptococcus pneumoniae	36				75							86															77		87	100	

* Urinary Tract isolates only

Non urine

 >= 5% more resistant 2023 than 2022

 >= 5% more sensitive 2023 than 2022

NOTES:

A. Some strains of *Escherichia coli*, *Klebsiella* sp., and *Proteus mirabilis* can produce Extended Spectrum Beta Lactamases (ESBLs). These strains should be considered resistant to all penicillins, cephalosporins, and monobactams. Treatment with a carbapenem is recommended.

B. Emerging resistance in Gram negative rods due to Carbapenemase and Metallo Beta Lactamase production is increasing world wide. These strains should be considered resistant to all penicillins, cephalosporins, carbapenems, and aztreonam. Resistance may also be demonstrated to the aminoglycosides and fluoroquinolones. Infectious Disease consult is recommended.

C. Clinical outcomes for aminoglycosides as monotherapy for systemic *Pseudomonas aeruginosa* infections are limited and have resulted in worse treatment outcomes (for infections outside of the urinary tract) compared with other therapies. Combination therapy for most indications other than urinary tract infections should be considered. Consultation with an infectious disease specialist is recommended.

D. Levofloxacin should not be used alone for antimicrobial therapy treatment for *Stenotrophomonas maltophilia*.

E. Some Enterobacterales (most commonly seen with *Citrobacter freundii* complex, *Enterobacter cloacae* complex and *Klebsiella aerogenes*) may develop resistance during therapy with 3rd-generation cephalosporins as a result of derepression of AmpC β-lactamase. Isolates initially susceptible may become resistant within a few days after initiation of therapy, so 3rd-generation cephalosporins are NOT recommended for these cases of bacteremia or invasive infection.

F. 49% of the *Staphylococcus aureus* isolates are MRSA (methicillin resistant). Susceptibility results for both hospital-acquired and community acquired MRSA isolates are combined on this antibiogram. Community acquired isolates tend to be susceptible to a greater number of antibiotics than hospital acquired MRSA strains, but they can be associated with more virulent infections.

G. 28% of *Haemophilus influenzae* are β-lactamase positive.

H. Per SJMC Infection Control Dept. policy for Multi-Drug Resistant Organisms: In addition to appropriate antibiotic therapy, patients must be placed in CONTACT ISOLATION PRECAUTIONS.