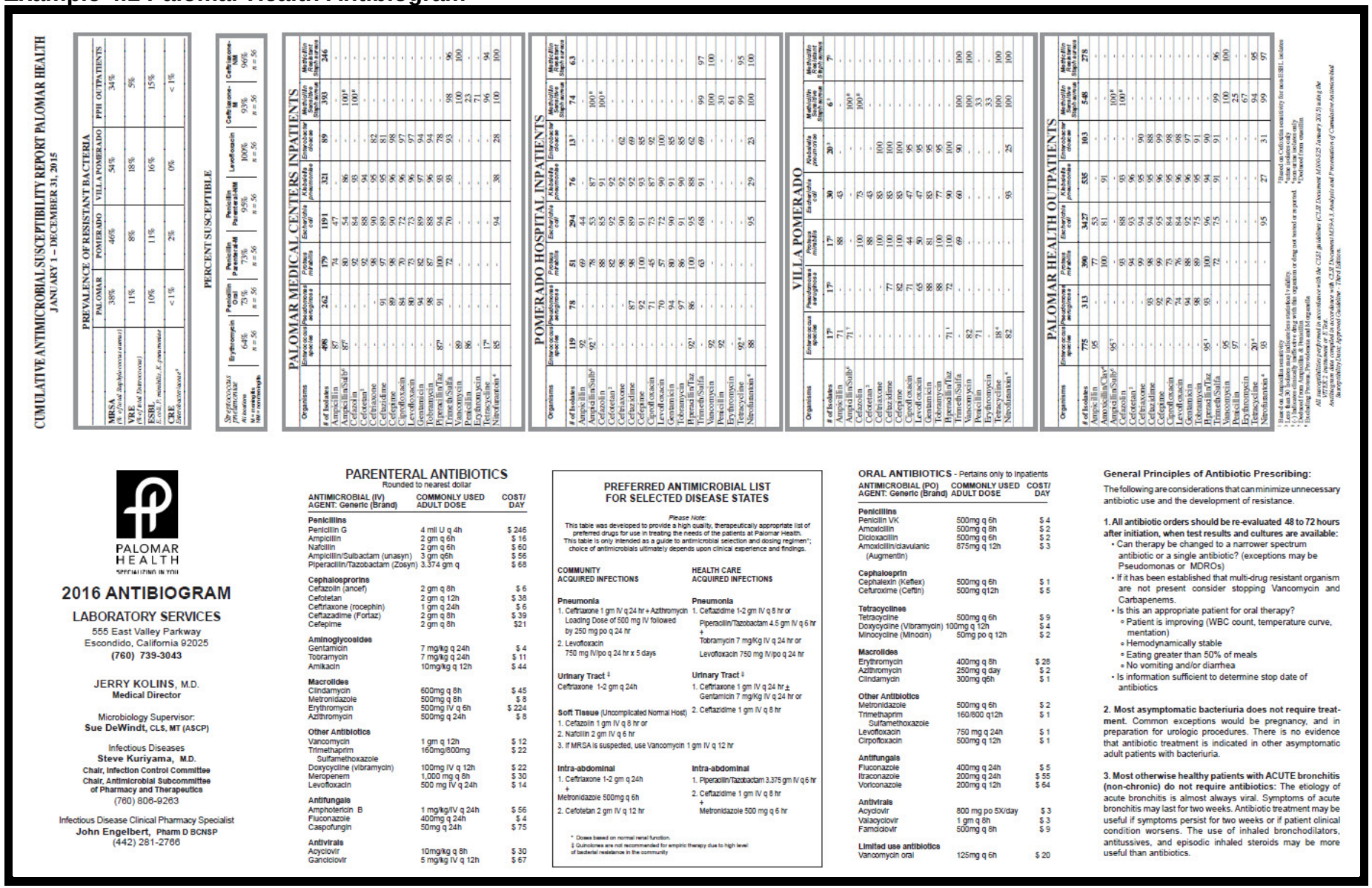
Example 4.1 Palomar Health Antibiogram



CUMULATIVE ANTIMICROBIAL SUSCEPTIBILITY REPORT PALOMAR HEALTH
JANUARY 1 – DECEMBER 31, 2015

PREVALENCE OF RESISTANT BACTERIA

	PALOMAR	POMERADO	VILLA POMERADO	PPH OUTPATIENTS
MRSA (Methicillin resistant Staphylococcus aureus)	38%	46%	54%	34%
VRE (Vancomycin resistant Enterococcus)	11%	8%	18%	5%
ESBL (E.coli, E. cloacae, K. pneumoniae)	10%	11%	16%	15%
CRE (Carbapenem resistant Enterobacteriaceae)*	< 1%	2%	0%	< 1%

PERCENT SUSCEPTIBLE

Streptococcus pneumoniae	Erythromycin	Penicillin	Penicillin Parenteral MIC	Levofloxacin	Ceftriaxone - Parenteral MIC
All isolates	64%	73%	93%	100%	96%
M = meningitis	n = 56	n = 56	n = 56	n = 56	n = 56
NM = non-meningitis					

PALOMAR MEDICAL CENTERS INPATIENTS

Organisms	Enterococcus species	Pseudomonas aeruginosa	Proteus mirabilis	Escherichia coli	Klebsiella pneumoniae	Enterobacter cloacae	Methicillin Sensitive Staph aureus	Methicillin Resistant Staph aureus
# of Isolates	498	262	179	1191	321	89	393	246
Ampicillin	87	-	74	47	-	-	-	-
Ampicillin/Sulb[2]	87[2]	-	80	54	86	-	100[3]	-
Cefazolin	-	-	92	84	93	-	100[3]	-
Cefotetan[1]	-	-	92	88	94	-	-	-
Ceftriaxone	-	-	98	90	95	82	-	-
Ceftazidime	-	91	97	89	95	81	-	-
Cefepime	-	89	98	90	96	98	-	-
Ciprofloxacin	-	84	70	72	96	97	-	-
Levofloxacin	-	89	73	73	96	97	-	-
Gentamicin	-	94	82	89	97	94	-	-
Tobramycin	-	98	87	88	96	94	-	-
Piperacillin/Taz.	87[2]	91	100	94	93	78	-	-
Trimeth/Sulfa	-	-	72	70	93	93	98	96
Vancomycin	89	-	-	-	-	-	100	100
Penicillin	86	-	-	-	-	-	23	-
Erythromycin	-	-	-	-	-	-	71	-
Tetracycline	17[2]	-	-	-	-	-	96	94
Nitrofurantoin[4]	85	-	-	94	38	28	100	100

POMERADO HOSPITAL INPATIENTS

Organisms	Enterococcus species	Pseudomonas aeruginosa	Proteus mirabilis	Escherichia coli	Klebsiella pneumoniae	Enterobacter cloacae	Methicillin Sensitive Staph aureus	Methicillin Resistant Staph aureus
# of Isolates	119	78	51	294	76	13[1]	74	63
Ampicillin	92	-	69	44	-	-	-	-
Ampicillin/Sulb[2]	92[2]	-	78	53	87	-	100[3]	-
Cefazolin	-	-	88	85	91	-	100[3]	-
Cefotetan[1]	-	-	82	92	92	-	-	-
Ceftriaxone	-	-	98	90	92	62	-	-
Ceftazidime	-	87	98	89	92	69	-	-
Cefepime	-	92	100	91	93	85	-	-
Ciprofloxacin	-	71	45	73	87	92	-	-
Levofloxacin	-	70	57	72	90	100	-	-
Gentamicin	-	97	90	90	91	85	-	-
Tobramycin	-	96	96	91	90	85	-	-
Piperacillin/Taz.	92[1]	86	100	95	88	62	99	97
Trimeth/Sulfa	-	-	63	68	91	69	100	100
Vancomycin	92	-	-	-	-	-	100	-
Penicillin	92	-	-	-	-	-	30	-
Erythromycin	-	-	-	-	-	-	61	-
Tetracycline	92[4]	-	-	-	-	-	99	95
Nitrofurantoin[4]	88	-	-	95	29	23	100	100

VILLA POMERADO

Organisms	Enterococcus species	Pseudomonas aeruginosa	Proteus mirabilis	Escherichia coli	Klebsiella pneumoniae	Enterobacter cloacae	Methicillin Sensitive Staph aureus	Methicillin Resistant Staph aureus
# of Isolates	17[2]	17[2]	17[2]	30	20[1]		6[1]	7[2]
Ampicillin	71	-	88	43	-	-	-	-
Ampicillin/Sulb[2]	71[1,2]	-	-	-	-	-	100[3]	-
Cefazolin	-	-	-	73	-	-	100[3]	-
Cefotetan[1]	-	-	88	43	100	-	-	-
Ceftriaxone	-	-	100	83	100	-	-	-
Ceftazidime	-	77	100	83	100	-	-	-
Cefepime	-	92	100	83	100	-	-	-
Ciprofloxacin	-	71	44	47	95	-	-	-
Levofloxacin	-	65	50	47	95	-	-	-
Gentamicin	-	88	81	83	95	-	-	-
Tobramycin	-	88	100	77	95	-	-	-
Piperacillin/Taz	71[1]	72	100	90	100	-	-	-
Trimeth/Sulfa	-	-	69	69	90	100	100	-
Vancomycin	82	-	-	-	-	-	100	100
Penicillin	71	-	-	-	-	-	33	-
Erythromycin	-	-	-	-	-	-	100	100
Tetracycline	18[4]	-	-	-	-	-	100	100
Nitrofurantoin[4]	82	-	-	-	93	25	100	100

PALOMAR HEALTH OUTPATIENTS

Organisms	Enterococcus species	Pseudomonas aeruginosa	Proteus mirabilis	Escherichia coli	Klebsiella pneumoniae	Enterobacter cloacae	Methicillin Sensitive Staph aureus	Methicillin Resistant Staph aureus
# of Isolates	775	313	390	3427	535	103	5.45	278
Ampicillin	95	-	77	53	-	-	-	-
Amoxicillin/Clav[2]		-	100	81	91	-	-	-
Ampicillin/Sulb[2]	95[1]	-	-	-	-	-	100[3]	-
Cefazolin	-	-	95	88	93	-	100[3]	-
Cefotetan[1]	-	-	99	94	95	90	-	-
Ceftriaxone	-	-	99	94	95	88	-	-
Cefepime	-	98	98	95	96	99	-	-
Ciprofloxacin	-	75	79	84	96	98	-	-
Levofloxacin	-	74	76	84	96	97	-	-
Gentamicin	-	94	88	92	96	91	-	-
Tobramycin	-	98	89	95	95	91	-	-
Piperacillin/Taz.	95[1]	93	100	96	94	90	-	-
Trimeth/Sulfa	-	-	72	75	91	91	99	96
Vancomycin	95	-	-	-	-	-	100	100
Penicillin	97	-	-	-	-	-	25	-
Erythromycin	-	-	-	-	-	-	67	-
Tetracycline	20[4]	-	-	-	-	-	94	95
Nitrofurantoin[4]	93	-	-	95	27	31	99	97

[1] Based on Cefoxitin resistivity for non-ESBL isolates
[2] Less than 30 isolates may indicate less statistical validity
[3] Inherent resistance with this organism or drug not tested or not proved
[4] Isolated from Ampicillin & Penicillin
[5] Excluding Proteus, Providencia and Morganella

All interpretive guidelines used in accordance with the CLSI guidelines (CLSI Document M100-S25, January 2015) using the Antibiogram data compiled in accordance with CLSI Document M39-A3, Analysis and Presentation of Cumulative Antimicrobial Susceptibility Data; Approved Guideline - Third Edition.

PALOMAR HEALTH
SPECIALIZING IN YOU

2016 ANTIBIOGRAM

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PARENTERAL ANTIBIOTICS
Rounded to nearest dollar

ANTIMICROBIAL (IV) AGENT: Generic (Brand)	COMMONLY USED ADULT DOSE	COST/ DAY
Penicillins		
Penicillin G	4 mil U q 4h	$ 246
Ampicillin	2 gm q 6h	$ 16
Nafcillin	2 gm q 6h	$ 60
Ampicillin/Sulbactam (unasyn)	3 gm q6h	$ 55
Piperacillin/Tazobactam (Zosyn)	3.374 gm q	$ 68
Cephalosporins		
Cefazolin (ancef)	2 gm q 8h	$ 6
Cefotetan	2 gm q 12h	$ 38
Ceftriaxone (rocephin)	1 gm q 24h	$ 6
Ceftazidime (Fortaz)	2 gm q 8h	$ 39
Cefepime	2 gm q 8h	$21
Aminoglycosides		
Gentamicin	7 mg/kg q 24h	$ 4
Tobramycin	7 mg/kg q 24h	$ 11
Amikacin	10mg/kg q 12h	$ 44
Macrolides		
Clindamycin	600mg q 8h	$ 45
Metronidazole	500mg q 8h	$ 8
Erythromycin	500mg IV q 6h	$ 224
Azithromycin	500mg q 24h	$ 8
Other Antibiotics		
Vancomycin	1 gm q 12h	$ 12
Trimethaprim Sulfamethoxazole	160mg/800mg	$ 22
Doxycycline (vibramycin)	100mg IV q 12h	$ 22
Meropenem	1,000 mg q 8h	$ 30
Levofloxacin	500 mg IV q 24h	$ 14
Antifungals		
Amphotericin B	1 mg/kg/IV q 24h	$ 56
Fluconazole	400mg q 24h	$ 4
Caspofungin	50mg q 24h	$ 75
Antivirals		
Acyclovir	10mg/kg q 8h	$ 30
Ganciclovir	5 mg/kg IV q 12h	$ 67

PREFERRED ANTIMICROBIAL LIST FOR SELECTED DISEASE STATES

Please Note:
This table was developed to provide a high quality, therapeutically appropriate list of preferred drugs for use in treating the needs of the patients at Palomar Health. This table is only intended as a guide to antimicrobial selection and dosing regimen*; choice of antimicrobials ultimately depends upon clinical experience and findings.

COMMUNITY ACQUIRED INFECTIONS	HEALTH CARE ACQUIRED INFECTIONS
Pneumonia	**Pneumonia**
1. Ceftriaxone 1 gm IV q 24 hr + Azithromycin Loading Dose of 500 mg IV followed by 250 mg po q 24 hr	1. Ceftazidime 1-2 gm IV q 8 hr or Piperacillin/Tazobactam 4.5 gm IV q 6 hr + Tobramycin 7 mg/Kg IV q 24 hr or Levofloxacin 750 mg IV/po q 24 hr
2. Levofloxacin 750 mg IV/po q 24 hr x 5 days	
Urinary Tract ‡	**Urinary Tract ‡**
Ceftriaxone 1-2 gm q 24h	1. Ceftriaxone 1 gm IV q 24 hr ± Gentamicin 7 mg/Kg IV q 24 hr or
	2. Ceftazidime 1 gm IV q 8 hr
Soft Tissue (Uncomplicated Normal Host)	
1. Cefazolin 1 gm IV q 8 hr or	
2. Nafcillin 2 gm IV q 6 hr	
3. If MRSA is suspected, use Vancomycin 1 gm IV q 12 hr	
Intra-abdominal	**Intra-abdominal**
1. Ceftriaxone 1-2 gm q 24h + Metronidazole 500mg q 6h	1. Piperacillin/Tazobactam 3.375 gm IV q 6 hr
2. Cefotetan 2 gm IV q 12 hr	2. Ceftazidime 1 gm IV q 8 hr + Metronidazole 500 mg q 6 hr

* Doses based on normal renal function.
‡ Quinolones are not recommended for empiric therapy due to high level of bacterial resistance in the community

ORAL ANTIBIOTICS - Pertains only to Inpatients

ANTIMICROBIAL (PO) AGENT: Generic (Brand)	COMMONLY USED ADULT DOSE	COST/ DAY
Penicillins		
Penicillin VK	500mg q 6h	$ 4
Amoxicillin	500mg q 8h	$ 2
Dicloxacillin	500mg q 6h	$ 2
Amoxicillin/clavulanic (Augmentin)	875mg q 12h	$ 3
Cephalosprin		
Cephalexin (Keflex)	500mg q 6h	$ 1
Cefuroxime (Ceftin)	500mg q12h	$ 5
Tetracyclines		
Tetracycline	500mg q 6h	$ 9
Doxycycline (Vibramycin)	100mg q 12h	$ 4
Minocycline (Minocin)	50mg po q 12h	$ 2
Macrolides		
Erythromycin	400mg q 8h	$ 28
Azithromycin	250mg q day	$ 2
Clindamycin	300mg q6h	$ 1
Other Antibiotics		
Metronidazole	500mg q 6h	$ 2
Trimethaprim Sulfamethoxazole	160/800 q12h	$ 1
Levofloxacin	750 mg q 24h	$ 1
Ciprofloxacin	500mg q 12h	$ 1
Antifungals		
Fluconazole	400mg q 24h	$ 5
Itraconazole	200mg q 24h	$ 55
Voriconazole	200mg q 12h	$ 64
Antivirals		
Acyclovir	800 mg po 5X/day	$ 3
Valacyclovir	1 gm q 8h	$ 3
Famciclovir	500mg q 8h	$ 9
Limited use antibiotics		
Vancomycin oral	125mg q 6h	$ 20

General Principles of Antibiotic Prescribing:

The following are considerations that can minimize unnecessary antibiotic use and the development of resistance.

1. All antibiotic orders should be re-evaluated 48 to 72 hours after initiation, when test results and cultures are available:
- Can therapy be changed to a narrower spectrum antibiotic or a single antibiotic? (exceptions may be Pseudomonas or MDROs)
- If it has been established that multi-drug resistant organism are not present consider stopping Vancomycin and Carbapenems.
- Is this an appropriate patient for oral therapy?
  - Patient is improving (WBC count, temperature curve, mentation)
  - Hemodynamically stable
  - Eating greater than 50% of meals
  - No vomiting and/or diarrhea
- Is information sufficient to determine stop date of antibiotics

2. Most asymptomatic bacteriuria does not require treatment. Common exceptions would be pregnancy, and in preparation for urologic procedures. There is no evidenoe that antibiotic treatment is indicated in other asymptomatic adult patients with bacteriuria.

3. Most otherwise healthy patients with ACUTE bronchitis (non-chronic) do not require antibiotics: The etiology of acute bronchitis is almost always viral. Symptoms of acute bronchitis may last for two weeks. Antibiotic treatment may be useful if symptoms persist for two weeks or if patient clinical condition worsens. The use of inhaled bronchodilators, antitussives, and episodic inhaled steroids may be more useful than antibiotics.

For more information about this example contact Laura Elliott, PharmD BCGP at Laura.Elliott@palomarhealth.org

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