

Antimicrobial Susceptibility Summary



2017—Pierce County, Washington

From Jan. 1 to Dec. 31, 2017, Pierce County civilian and military hospital labs (except St. Joseph Medical Center) reported antibiotic susceptibility test results to Tacoma-Pierce County Health Department.

Test results include inpatient and outpatient data. Data includes only bacterial isolates collected for diagnostic purposes. Surveillance cultures are not included. Results reflect combinations of different patient populations with different syndromes, infection sites and risk factors for drug-resistant organisms (e.g., adult, pediatric, inpatient, outpatient, ICU, non-ICU).

Based on this data and established treatment guidelines, Pierce County Antibiotic Resistance Task Force recommends the following.

Urinary Tract Infection

- Short courses, selecting recommended agents and avoiding fluoroquinolones are important stewardship strategies.
- Cephalosporins (i.e., cephalexin, cefpodoxime, cefdinir) and nitrofurantoin (if creatinine clearance (CrCl) > 60 ml/min) are the best options for empiric urinary tract infection (UTI) treatment.
- Avoid sulfamethoxazole-trimethoprim (TMP-SMX, Bactrim) unless susceptibilities are available. Resistance rates for common gram-negative pathogens causing UTI are rising. Avoid empiric treatment with TMP-SMX where resistance rates are 20% or greater. *E. coli* resistance to TMP-SMX in Pierce County was 19% in 2017 but has been 20% or more in recent years. We recommend not using it for empiric treatment.
- Patients without urinary symptoms generally do **not** need treatment for positive urine dipstick or urinalysis testing (unless pregnant or undergoing an invasive urological procedure).
- Use nitrofurantoin for afebrile cystitis only (not pyelonephritis). Patient must have CrCl > 60 for drug to be excreted into the urinary tract.
- Due to the possibility of side effects and rising resistance levels in some parts of the world, reserve fluoroquinolone use when possible. When prescribing fluoroquinolones, ciprofloxacin is preferred for gram-negative coverage in UTI. Avoid moxifloxacin, as it is not renally excreted.

Methicillin-resistant *Staphylococcus aureus*

- Pierce County's overall Methicillin-resistant *Staphylococcus aureus* (MRSA) rate was 42%, nearly unchanged from 2016.

- MRSA coverage should be considered for purulent skin and soft tissue infections (SSTI). Non-purulent SSTIs are rarely caused by *Staphylococcus aureus* and MRSA coverage is usually not necessary.
- The best agents for empiric MRSA coverage include TMP-SMX and tetracycline analogs (i.e., minocycline or doxycycline).
- Due to the risk of renal failure and severe side effects, TMP-SMX should be used with caution in the elderly and those with pre-existing renal dysfunction.

Acute Otitis Media in Pediatric Patients

- Consider treating uncomplicated acute otitis media (AOM) without antibiotics to reduce antibiotic resistance. Most cases of AOM resolve without antibiotics.
- When otitis media with effusion (OME) is diagnosed, antibiotics are not the answer. Effusions may take many weeks to resolve.
- First line therapy for AOM, when needed, should be amoxicillin 90 mg/kg/day divided BID (maximum 2g/day) for 5 to 10 days, depending on child's age and severity of illness.

Limitations

- Data are the result of single organism-antimicrobial combinations. They do not show trends in cross-resistance between an organism and multiple drugs. Nor do they reveal synergistic properties of using different antimicrobials in combination with each other.
- Organisms can have multiple strains and are not always homogenous for clinical pathology or drug resistance. For example, this report combines all isolates of *Staphylococcus aureus*, regardless of methicillin-resistance.
- We were unable to determine how many *Streptococcus pneumoniae* isolates were invasive, meaning they were obtained from a sterile site within the body.
- Not all labs use the same methods to test for microbial resistance or create antibiograms. Inconsistency in methods can mask important differences and trends.
- St. Joseph Medical Center did not report data.
- Data may not be generalized to specific patient populations or community locations.

2017—Antimicrobial Susceptibility of Common Organisms, Pierce County

Gram Negative Organism	Tested No.	Ampicillin %	Pip./Taz. %	Cefazolin %	Ceftriaxone %	Ceftazidime %	Imipenem %	Gentamicin %	Meropenem %	Tobramycin %	Nitrofuratoin %	Ciprofloxacin %	Levofloxacin %	Trimeth/sulfa %
<i>Acinetobacter baumannii</i>	242	nt	nt	n/a	nt	86	nt	93	nt	100	nt	79	nt	93
<i>Citrobacter freundii</i>	316	<30	82	nt	75	nt	91	95	nt	98	95	94	88	90
<i>Enterobacter aerogenes</i>	354	nt	84	nt	84	nt	71	100	nt	100	<30	98	100	98
<i>Enterobacter cloacae</i>	540	nt	83	nt	73	nt	95	97	100	95	<30	94	95	88
<i>Escherichia coli</i>	21,735	61	98	89	95	94	100	95	100	98	97	86	88	81
<i>Klebsiella pneumoniae</i>	2,679	nt	95	91	96	98	99	98	100	99	40	93	96	90
<i>Morganella morganii</i>	85	nt	97	nt	83	nt	nt	88	nt	nt	nt	59	nt	66
<i>Proteus mirabilis</i>	1,326	79	100	80	95	89	nt	89	97	97	nt	75	68	77
<i>Pseudomonas aeruginosa</i>	1,759	nt	87	nt	nt	88	63	88	89	94	nt	76	80	nt
<i>Serratia marcescens</i>	167	nt	94	n/a	89	nt	75	98	nt	70	nt	90	nt	nt

nt = Not tested.

Gram Positive Organism	Tested No.	Penicillin %	Oxacillin %	Clindamycin %	Erythromycin %	Gentamicin %	Nitrofuratoin %	Levofloxacin %	Tetracycline %	Rifampin %	Trimeth./Sulfa. %	Vancomycin %
<i>Enterococcus species</i>	1,191	98	nt	nt	nt	82	95	88	28	nt	nt	94
<i>Staphylococcus aureus</i>	7,566	<30	58	76	42	99	100	nt	92	nt	93	100

<i>Strep pneumoniae</i> 172 isolates	Tested No.	Susceptible %
Ceftazidime	0	---
Ceftriaxone	172	97
Erythromycin	33	76
Levofloxacin	172	99
Penicillin	172	84
Tetracycline	33	85
Trimeth./Sulfa.	33	91
Vancomycin	33	100

2015-2017—Three-Year Trends in Antimicrobial Susceptibility, Pierce County

Organism	Drug	% Susceptibility by Year			% Total Change 2014 vs. 2016
		2014	2015	2016	
<i>Citrobacter freundii</i>	Ceftriaxone	84	79	75	-9
<i>Citrobacter freundii</i>	Nitrofuratoin	88	92	95	7
<i>Citrobacter freundii</i>	Piperacillin-Tazobactam	88	87	82	-6
<i>Citrobacter freundii</i>	Trimeth./Sulfa.	80	85	90	10
<i>Enterobacter cloacae</i>	Ceftriaxone	79	74	73	-6
<i>Enterococcus</i>	Levofloxacin	81	94	88	7
<i>Escherichia coli</i>	Levofloxacin	81	90	88	7
<i>Escherichia coli</i>	Tobramycin	90	95	98	8
<i>Klebsiella pneumoniae</i>	Nitrofuratoin	35	40	40	5
<i>Morganella morganii</i>	Ciprofloxacin	---	84	59	-25
<i>Morganella morganii</i>	Trimeth./Sulfa.	---	92	66	-26
<i>Proteus mirabilis</i>	Ampicillin	72	78	79	7
<i>Proteus mirabilis</i>	Ceftazidime	94	97	89	-5
<i>Proteus mirabilis</i>	Tobramycin	88	97	97	9
<i>Proteus mirabilis</i>	Trimeth./Sulfa.	71	78	77	5
<i>Pseudomonas aeruginosa</i>	Ciprofloxacin	70	76	76	5
<i>Pseudomonas aeruginosa</i>	Imipenem	84	90	63	-21
<i>Pseudomonas aeruginosa</i>	Levofloxacin	67	80	80	13
<i>Pseudomonas aeruginosa</i>	Piperacillin-Tazobactam	100	89	87	-12
<i>Staphylococcus epidermi</i>	Clindamycin	49	40	60	11
<i>Staphylococcus epidermi</i>	Oxacillin	34	36	44	10
<i>Staphylococcus epidermi</i>	Trimeth./Sulfa.	68	59	55	-14
<i>Streptococcus pneumonia</i>	Erythromycin	---	63	85	22
<i>Streptococcus pneumonia</i>	Trimeth./Sulfa.	---	75	93	18

Results limited to statistically significant trends.

**ANTIBIOTIC
RESISTANCE**
Task Force

