

## Cumulative Antibigrams 2020: John Hunter Hospital Commentary

### Antibiogram key

	> 90% of isolates susceptible
	70-90% of isolates susceptible
	< 70% of isolates susceptible
	Not tested, not clinically effective, intrinsically resistant, or no data available from OrgTRx
	Antibiotic not recommended to be used in children. Seek specialist advice

### Notes:

1. Data processed by OrgTRx (antibiogram) software to exclude multiple isolates so only the first isolate of a given species per patient per year per subset (e.g., urine) is included. Only data captured by OrgTRx is presented.
2. Only organisms with 30 or more isolates are included (CLSI Guidelines M39-A4 recommended that results should include at least 30 isolates to be considered significant.)
3. Antimicrobial susceptibility testing standard used: EUCAST v8.1
4. The John Hunter Hospital antibiogram captures data from the following site: John Hunter Hospital.

### Blood Cultures

Infectious Syndrome	Abridged Therapeutic Guidelines (TG) empirical recommendations
<b>Empirical regimens for adults with community-acquired sepsis or septic shock, source not apparent</b>	Gentamicin PLUS Flucloxacillin PLUS Vancomycin PLUS Ceftriaxone/Cefotaxime (if <i>Neisseria meningitidis</i> suspected)
See <i>eTG Complete &gt; Antibiotic &gt; Empirical regimens for sepsis or septic shock</i> for an unabridged description	

- Predominant pathogens isolated from blood cultures collected in the John Hunter Hospital included *Escherichia coli*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, and *Pseudomonas aeruginosa*.
- *Escherichia coli* isolates demonstrated 55% susceptibility to ampicillin and 94% susceptibility to gentamicin.
- *Staphylococcus aureus* isolates demonstrated 92% susceptibility to flucloxacillin and were susceptible to vancomycin. 8% of isolates were MRSA.
- *Pseudomonas aeruginosa* isolates demonstrated 100% susceptibility to gentamicin. This species is intrinsically resistant to ceftriaxone and cefotaxime.

### Urinary Isolates

Infectious Syndrome	Abridged Therapeutic Guidelines (TG) empirical recommendations
<b>Empirical antibiotic therapy for nonpregnant women with acute cystitis</b>	Trimethoprim OR Nitrofurantoin OR Cefalexin
<b>Empirical antibiotic therapy for men with acute cystitis</b>	Trimethoprim OR Nitrofurantoin OR Cefalexin

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Infectious Syndrome	Abridged Therapeutic Guidelines (TG) empirical recommendations
Treatment of nonsevere pyelonephritis in adults	Amoxicillin+Clavulanate OR Ciprofloxacin
Treatment of severe pyelonephritis in adults	Gentamicin AND Ampicillin/Amoxicillin OR Ceftriaxone/Cefotaxime
See eTG Complete > Antibiotic > Acute cystitis in adults and Acute pyelonephritis in adults for an unabridged description	

- The predominant pathogens from urine samples included: *Escherichia coli*, *Klebsiella pneumoniae*, *Klebsiella oxytoca*, *Proteus mirabilis*, *Enterobacter cloacae*, *Pseudomonas aeruginosa*, *Enterococcus faecalis*, *Enterococcus faecium*.
- *Escherichia coli* demonstrated mixed rates of susceptibility to first line oral agents for cystitis and non-severe pyelonephritis (76% trimethoprim susceptibility, and 99% nitrofurantoin susceptibility). The isolates were typically susceptible to first line intravenous therapy options for severe pyelonephritis (95% gentamicin susceptibility and 54% ampicillin susceptibility).
- *Klebsiella pneumoniae* isolates showed susceptibility to oral options (84% trimethoprim susceptibility) and first line intravenous option (97% gentamicin susceptibility). Isolates were typically not susceptible to ampicillin (2% susceptibility).
- Isolates of *Pseudomonas aeruginosa* isolates demonstrated high rates of susceptibility to oral options (90% ciprofloxacin susceptibility) and first line intravenous therapy option (94% gentamicin susceptibility).
- *Enterococcus faecalis* isolates demonstrated high rates of susceptibility were observed to first line oral agents (100% nitrofurantoin susceptibility, 100% ampicillin susceptibility) and empiric and directed intravenous therapies (99% vancomycin susceptibility). 1% of these isolates were VRE.
- *Enterococcus faecium* isolates demonstrated low rates of susceptibility were observed to first line oral agents (9% ampicillin susceptibility) and low rates of susceptibility to empiric and directed intravenous therapies (51% vancomycin susceptibility). 49% of these isolates were VRE.

### Other Isolates Commentary

The Cumulative Antibiogram for “Other Isolates” provides summary data of antibiotic resistance patterns for organisms obtained from sites other than blood and urine. Chiefly these bacteria are collected from skin, soft tissue, respiratory track and surgical sites. Infection control screens are excluded.

Infectious Syndrome	Abridged Therapeutic Guidelines (TG) empirical recommendations
Empirical regimens for adults with community-acquired sepsis or septic shock, source not apparent	Gentamicin PLUS Flucloxacillin PLUS Vancomycin PLUS Ceftriaxone/Cefotaxime (if <i>Neisseria meningitidis</i> suspected)
Empirical therapy for cellulitis and erysipelas without systemic features > purulent cellulitis	Dicloxacillin OR Flucloxacillin OR Cefalexin (if delayed non-severe hypersensitivity to penicillins)

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Infectious Syndrome	Abridged Therapeutic Guidelines (TG) empirical recommendations
	OR trimethoprim+sulfamethoxazole OR clindamycin (if increased risk of MRSA or immediate hypersensitivity to penicillins)
<b>Empirical antibiotic therapy for peritonitis due to perforated viscus</b>	Gentamicin PLUS metronidazole PLUS Ampicillin OR Piperacillin+tazobactam OR Ceftriaxone/Cefotaxime PLUS metronidazole
<b>Empirical therapy: low-severity CAP in adults</b>	Amoxicillin OR Doxycycline OR Clarithromycin (if non-immediate hypersensitivity to penicillin or suspected atypical cause)
<b>Empirical therapy: moderate-severity CAP in adults</b>	Benzyloxyethyl penicillin PLUS (Doxycycline OR clarithromycin) OR Ceftriaxone/Cefotaxime PLUS (Doxycycline OR clarithromycin) (if immediate non-severe or delayed non-severe hypersensitivity to penicillin)
<b>Empirical therapy: high-severity CAP in adults</b>	(Ceftriaxone OR Cefotaxime) PLUS Azithromycin OR Benzyloxyethyl penicillin PLUS Gentamicin PLUS Azithromycin
See <i>eTG Complete &gt; Antibiotic &gt;</i> for an unabridged description	

- Predominant pathogens included: *Escherichia coli*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Enterococcus faecalis*, *Streptococcus pneumoniae*, *Streptococcus pyogenes* (Group A), *Enterobacter cloacae* complex, *Serratia marcescens*, *Enterococcus faecium*, *Klebsiella oxytoca*, *Streptococcus sp.* (Group C), and *Haemophilus influenzae*.
- *Staphylococcus aureus* was frequently isolated from the samples collected at John Hunter Hospital. Isolates demonstrated high rates of susceptibility to flucloxacillin (81% susceptibility) as the recommended first line oral agent and cefalexin as the second line agent recommended for use in penicillin hypersensitivity. 19% of isolates were MRSA. First line oral agents for the treatment of MRSA demonstrated high rates of susceptibility (85% clindamycin susceptibility, 96% sulfamethoxazole and trimethoprim susceptibility and 95% doxycycline susceptibility).
- *Streptococcus pneumoniae* was another Gram-positive organism of note. The breakpoint for penicillin susceptibility for treating *Streptococcus pneumoniae* meningitis is an MIC  $\leq$  0.06 mg/L; Pneumococcal infections outside the central nervous system with MICs  $\leq$  2 mg/L will respond to high dose penicillin or other narrow spectrum  $\beta$ -lactam antibiotics. 69% of isolates tested were susceptible to erythromycin.
- *Haemophilus influenzae* isolates demonstrated 57% ampicillin susceptibility, and 98% ceftriaxone susceptibility.
- *Pseudomonas aeruginosa* isolates demonstrated 86% gentamicin susceptibility, 87% ceftazidime susceptibility, and 84% ciprofloxacin susceptibility.

## Cumulative Antibigrams 2020: John Hunter Hospital: Blood

Organism	Ampicillin		Amoxicillin and clavulanic acid		Cefazolin		Gentamicin		Amikacin		Piperacillin and tazobactam		Ceftriaxone		Ceftazidime		Cefepime		Meropenem		Ciprofloxacin		Vancomycin		Sulfamethoxazole and trimethoprim		Benzylpenicillin		Flucloxacillin		
	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n			
Escherichia coli	55	173	80	169	66	171	94	172	98	170	92	173	93	174	92	172	89	45	100	173	91	171			74	170					
Staphylococcus aureus																										98	97	27	97	92	97
Klebsiella pneumoniae	0	37	84	37	78	36	86	36	100	36	77	35	89	37	94	36			97	36	86	35			86	37					
Pseudomonas aeruginosa							100	34	100	34	100	34			97	34			97	33	94	34									

## Cumulative Antibigrams 2020: John Hunter Hospital: Urine

Organism	Benzylpenicillin		Ampicillin		Cefazolin		Fluocloxacillin		Clindamycin		Erythromycin		Gentamicin		Piperacillin and tazobactam		Amikacin		Ceftriaxone		Cefepime		Meropenem		Ciprofloxacin		Vancomycin		Trimethoprim		Nitrofurantoin		Norfloxacin		Ceftazidime			
	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n				
Escherichia coli			54	1,443	53	1,378							95	1,443	90	598	99	599	93	1,446	88	591	100	1,214	88	1,395			76	1,442	99	1,440	86	1,442	93	1,395		
Staphylococcus aureus	19	43					85	62	88	33	81	32	94	33											88	33	100	35	96	52								
Klebsiella pneumoniae			2	180	73	165							97	180	87	103	100	106	96	180	94	104	100	159	90	172			84	180			88	180	96	172		
Pseudomonas aeruginosa													94	188	85	87	91	89			91	87	96	183	90	188									95	188		
Enterococcus faecalis			100	276																						99	183			100	273							
Enterobacter cloacae complex			0	98	0	98							84	98			97	71			84	70	93	97	82	96			73	98			79	98				
Proteus mirabilis			91	81	66	74							98	81	100	39	95	37	100	82	100	37	100	65	98	81			74	80			98	81	100	80		
Enterococcus faecium	0	39	9	56																						51	57											
Klebsiella oxytoca			0	42	15	41							100	42	78	32	100	30	86	43	100	30	100	39	98	42			93	42			98	42	100	42		
Enterobacter aerogenes			0	36									100	36									100	36	100	36			94	36			100	36				

### Cumulative Antibigrams 2020: John Hunter Hospital: Other

Organism	Ampicillin		Amoxicillin and clavulanic acid		Cefazolin		Sulfamethoxazole and trimethoprim		Gentamicin		Tobramycin		Amikacin		Ceftriaxone		Cefepime		Ceftazidime		Piperacillin and tazobactam		Meropenem		Ciprofloxacin		Vancomycin		Telicoplanin		Linezolid		Clindamycin		Fusidic acid		Rifampicin		Benzylpenicillin		Erythromycin		Flucloxacillin		Doxycycline		Mupirocin			
	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n	%S	n				
Escherichia coli	56	199	84	198	69	189	81	199	92	199	92	199	99	199	92	200	94	191	89	199	95	198	100	199	87	199																								
Staphylococcus aureus							96	1,577	97	1,452											93	1,453	100	1,451	98	1,414	100	1,426	85	1,522	97	1,444	100	1,439	16	1,544	84	1,585	81	1,580	95	1,579	97	1,574						
Klebsiella pneumoniae	0	54	89	54	83	47	94	54	96	54	96	54	100	54	98	54	100	51	98	54	87	53	100	54	96	54																								
Pseudomonas aeruginosa									86	329	91	328	86	328			86	275	87	329	82	325	89	327	84	329																								
Enterococcus faecalis	99	68																					100	68	100	52	100	54																						
Streptococcus pneumoniae																																																		
Streptococcus pyogenes (Group A)																							100	143																										
Enterobacter cloacae complex	0	133	0	132	0	133	92	132	94	133	92	132	98	133			90	124					98	133	94	133																								
Serratia marcescens	0	77	0	77	0	77	100	76	100	77	57	77	100	76			100	66					100	77	99	77																								
Enterococcus faecium	13	39																					60	43	67	33	100	32																						
Klebsiella oxytoca	0	32	94	32	19	32	94	32	97	32	97	32	97	32	91	33	100	31	100	32	94	33	100	32	100	32																								
Streptococcus sp. (Group C)																									100	69																								
Haemophilus influenzae	57	164	73	164			75	163							98	164																																		