

# Cumulative Antibiograms: Maitland Hospital, 2016

## Overview

Cumulative antibiograms summarise the collective susceptibility of specific bacterial isolates against various antibiotics. Online versions are available from <https://aimed.net.au/antibiograms/>.

**Infectious Disease consultancy advice** on clinical and antimicrobial treatment is available at all hours from the on-call HNE Infectious Diseases Service (call 49213000 and page ID registrar or consultant). It is strongly recommended that advice is obtained for all patients with:

- *Staphylococcus aureus* bloodstream infection
- Infective spinal discitis or osteomyelitis at any site
- Infected joint replacements (early or late; suspected or proven)
- Bacterial meningitis (suspected or proven)
- Bacterial or culture negative endocarditis

An abridged **CEC Severe Sepsis First Dose Empirical Intravenous Antibiotic Guideline** and other antibiotic guidelines/resources are available on the HNE Quality Use of Medicines Smart phone enabled website [www.hnequm.com](http://www.hnequm.com) and via the HNE Guidelines and CEC Sepsis pages at [www.aimed.net.au](http://www.aimed.net.au), Pathology North's Antimicrobial Stewardship resource site.

For queries or production of other summary analyses of microbiology data, please contact the on-call Medical Microbiologist (tel. 49214000). HNE LHD 2015 epidemiological reports have been prepared for *Staphylococcus aureus* (MSSA and MRSA), vancomycin-resistant enterococci, *Streptococcus pneumoniae*, multi-resistant Gram negative species and *Clostridium difficile*. These reports are available on the [Infection Prevention Service intranet page](#).

## Data records

Element	Period
Urine isolates	January-December 2016

**For non-urine samples, signal isolate and bloodstream analyses, see Hunter region antibiogram.**

## Antibiogram notes

- Analyses and this document was prepared by Mr Wayne Griffiths and Dr John Ferguson, Pathology North, March 2017
- Testing at this location was performed according to the European Union Committee on Antimicrobial Susceptibility Testing (EUCAST) method over this period.
- The methods employed to construct the antibiogram are broadly based upon the Clinical and Laboratory Standards Institute (CLSI) M39-A3 document – *Analysis and presentation of cumulative antimicrobial susceptibility test data; approved guideline – Third Edition*. Published Feb 2009. The format was defined by the Australian Commission on Safety and Quality in Healthcare in 2013.
- Isolates cultured from all inpatients and outpatients attending HNE facilities served by Pathology North laboratories in this region. Comparative resistance rates between certain patient groups and institutions may differ significantly. Infection control screening isolates have not been included.
- Only the first isolate per patient per 365 day period has been included to prevent statistical bias from repeated sampling of multi-resistant isolates
- Note that not all antibiotics were tested against every isolate listed in each category. If this has happened, the number of isolates tested is shown below the percentage where this number is less than 90% of the total isolates. Where lesser numbers are tested, overall susceptibility may be falsely deflated as only more resistant isolates get tested against broader spectrum (restricted) antibiotics.
- Species with test data for less than 30 isolates have generally been excluded.

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## Urinary isolate antibiogram

Organism type	Isolates	% total	Unrestricted antibiotics					Restricted antibiotics			
			Ampicillin	Amoxicillin+ clavulanate	Cefazolin / cephalixin	Nitrofurantoin	Trimethoprim	Gentamicin (aminoglycoside)	Ceftriaxone	Norfloxacin	
All isolates	3,025	100%	Some miscellaneous/contaminant species excluded.								
Gram negative isolates	<i>Escherichia coli</i>	1,805	60%	61%	88%	88%	100%	81%	97%	97%	94%
	<i>Klebsiella</i> species	247	8%	R	95%	84%	n/a	91%	100%	97%	94%
	<i>Enterobacter</i> -like species*	138	5%	R	R	R	n/a	85%	98%	**	97%
	<i>Proteus mirabilis</i>	118	4%	94%	99%	95%	R	72%	99%	99%	100%
	<i>Pseudomonas aeruginosa</i>	124	4%	R	R	R	R	R	98%	R	95%
Gram positives	<i>Staphylococcus saprophyticus</i>	100	3%	S	S	S	100%	100%	n/a	S	n/a
	<i>Streptococcus agalactiae</i> (group B strep)	176	6%	S	S	S	n/a	n/a	R	S	n/a
	<i>Enterococcus faecalis</i>	317	10%	97%	95%	R	98%	R	R	R	R

### Table notes

n/a	Not available - not routinely tested in this laboratory or no testing standard available
93%	> 90% of isolates susceptible
S	Susceptible by extrapolation or intrinsically susceptible
75%	70-89% of isolates susceptible
45%	< 70% of isolates susceptible
R	Intrinsically resistant
*	<i>Enterobacter</i> , <i>Serratia</i> , <i>Citrobacter</i> , <i>Providencia</i> , <i>Morganella</i> species (excludes <i>C. diversus</i> )
**	Resistance may emerge during therapy and agent NOT recommended for these species
	Refer to <a href="https://aimed.net.au/about/hne-guidelines/">https://aimed.net.au/about/hne-guidelines/</a> for HNELHD restricted anti-infective indications

### Combined urine isolate antibiograms (District wide)

Organism type	Ampicillin OR gentamicin susceptible	Cefazolin OR gentamicin susceptible
All unique Enterobacteriaceae ( <i>E. coli</i> , <i>Klebsiella</i> and other species) isolates from urine (n=10189)	97%	98%

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### Urinary isolate antibiogram: commentary

Please consult Therapeutic Guidelines: Antibiotic (TG:A) for recommended dosing and duration of therapy.

Infectious Syndrome	Therapeutic Guidelines (TG) empiric recommendations	Comments relating to the local cumulative antibiogram
<b>Urosepsis (severe)</b>	1. Ampicillin PLUS gentamicin  OR (if non-immediate hypersensitivity to penicillin):  2. Gentamicin alone  <i>N.B. Ceftriaxone ONLY for patients with absolute or relative C/I for gentamicin use<sup>1</sup>.</i>	Gentamicin retains activity against nearly all Gram negative uropathogens. It is usual to give just one dose in the setting of pyelonephritis or severe sepsis associated with urine source.  Ampicillin provides optimal coverage for streptococci and enterococci that also cause UTI.  Early oral switch based on tested susceptibility is indicated once a patient begins to respond to treatment (usually within 48hrs).
<b>Urosepsis (outpatient therapy)</b>	Trimethoprim OR Nitrofurantoin OR Amoxicillin+clavulanate OR Cephalexin  <i>N.B. Norfloxacin ONLY if resistance to above is proven or infection with Pseudomonas confirmed.</i>	All of these agents retain good levels of activity against common Gram negative uropathogens such as <i>E. coli</i> . These agents are suitable for oral switch, provided that susceptibility to the specific agent is confirmed.  <i>N.B. Trimethoprim can cause hyperkalaemia and is potentially dangerous in patients who are on an ACE inhibitor – see this cautionary posting -</i> <a href="https://aimed.net.au/2014/11/27/cotrimoxazole-increases-risk-of-sudden-death-in-patients-receiving-renin-at-inhibitors/">https://aimed.net.au/2014/11/27/cotrimoxazole-increases-risk-of-sudden-death-in-patients-receiving-renin-at-inhibitors/</a>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• <b>With few exceptions, urine cultures should NOT be collected from patients who don't have symptoms of infection.</b></li> <li>• Presence of abnormal urinalysis, cloudy or smelly urine are NOT indications for culture <i>per se</i>.</li> <li>• Patients catheterised for more than 48 hours require a new catheter prior to sample collection or collection of an MSU following catheter removal.</li> <li>• <b>Always clearly specify the type of urine sample being submitted and the indication for collection</b> on the pathology request form. See also:  <a href="http://www.cec.health.nsw.gov.au/_data/assets/pdf_file/0011/293726/UrineSpecimenCollectionDecisionSupportTool.pdf">http://www.cec.health.nsw.gov.au/_data/assets/pdf_file/0011/293726/UrineSpecimenCollectionDecisionSupportTool.pdf</a></li> <li>• Empirical use of norfloxacin or ceftriaxone is discouraged. Reserve these agents for directed therapy against pathogens resistant to first line agents.</li> <li>• For multi-resistant Gram negative urinary isolates, fosfomycin can be tested and is often susceptible. This drug is given orally and is effective in urinary tract infection. Please discuss with the Medical Microbiologist on-call if required (tel. 49214000). SAS approval is required for use.</li> </ul>	

#### <sup>1</sup> Aminoglycosides should **NOT** be used in patients with:

- a history of vestibular or auditory toxicity caused by an aminoglycoside
- a history of serious hypersensitivity reaction to an aminoglycoside (rare)
- myasthenia gravis.

#### Unless the infection is life-threatening, aminoglycosides should generally be avoided in patients with:

- pre-existing significant auditory impairment (hearing loss or tinnitus)
- pre-existing vestibular condition (dizziness, vertigo or balance problems)
- a family history (first-degree relative) of auditory toxicity caused by an aminoglycoside
- chronic renal impairment (creatinine clearance less than 40 mL/min) or rapidly deteriorating renal function
- advanced age (eg 80 years or older), depending on calculated renal function.