Cumulative Antibiograms: Urinary Isolate Commentary

Recent urinary antimicrobial resistance trends

Gram negative gentamicin susceptibility remains high (above 95%) across all sites.

Gram negative quinolone (norfloxacin) susceptibility is declining slowly but remains higher than 90% for initial isolates at all sites that tested this agent routinely. It is important to conserve this agent as much as possible by avoiding its use when the isolate tests susceptible to a first line agent.

Gram negative ceftriaxone resistance detects the presence of an extended spectrum betalactamase (ESBL) -producing organism. The incidence of ESBL from initial urinary isolates remained low at all sites. Note that the antibiogram methodology involves selection of only the first isolate from each patient over a 365 day period which overestimates the level of quinolone and ceftriaxone susceptibility. The results for subsequent urinary isolates indicated these lower levels of *E. coli* susceptibility:

Region	Ceftriaxone susceptibility (N)	Norfloxacin susceptibility (N)
Hunter New England	92% (877)	87% (921)
Mid North Coast*	n/a	n/a
Northern NSW	90% (434)	82% (434)

* These agents were not tested on all urinary isolates of Gram negative pathogens at this site.

Treatment recommendations and commentary

Infectious Syndrome	Therapeutic Guidelines (TG) empiric recommendations	Comments relating to the cumulative antibiogram
Urosepsis (severe)	1. Ampicillin PLUS gentamicin OR (if non-immediate hypersensitivity to penicillin): 2. Gentamicin alone ***N.B.*** *Ceftriaxone ONLY for patients with absolute or relative contraindication for gentamicin use*[a].	It is usual to give just one dose of gentamicin in the setting of pyelonephritis or severe sepsis associated with urine source. Ampicillin provides optimal coverage for streptococci and enterococci (see below) that also cause urinary tract infection. Early oral switch based on tested susceptibility is

[a] **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 (e.g. 80 years or older), depending on calculated renal function.

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Infectious Syndrome	Therapeutic Guidelines (TG) empiric recommendations	Comments relating to the cumulative antibiogram
		indicated once a patient begins to respond to treatment (usually within 48hrs).
Urosepsis (outpatient therapy)	Trimethoprim OR Nitrofurantoin OR Amoxicillin+clavulanate OR Cephalexin ***N.B.*** *Norfloxacin ONLY if resistance to above is proven or infection with Pseudomonas confirmed.*	All of these agents retain good levels of activity against common Gram negative uropathogens such as *E. coli.* These agents are suitable for oral switch, provided that susceptibility to the specific agent is confirmed. ***N.B.*** *Trimethoprim can cause hyperkalaemia and is potentially dangerous in patients who are on an ACE inhibitor – see this cautionary posting on AIMED.*
Notes: urine specimens	• **With few exceptions, urine cultures should NOT be collected from patients who don't have symptoms of infection.** Presence of abnormal urinalysis, cloudy or smelly urine are NOT indications for culture *per se.* • **Patients catheterised for more than 48 hours require a new catheter prior to sample collection** or collection of an MSU following catheter removal. • **Do NOT send catheter tips for culture.** In general, avoid prolonged use of indwelling urinary catheters as there is a risk of infection that increases by day and persists for a time following removal of the catheter. • **Always clearly specify the type of urine sample being submitted and the indication for collection** on the pathology request form. See also: http://www.cec.health.nsw.gov.au/__data/assets/pdf_file/0011/293726/UrineSpecimenCollectionDecisionSupportTool.pdf.	
Notes: results and treatment	• Consult Therapeutic Guidelines: Antibiotic (TG:A) for recommended dosing and duration of therapy. • Isolation of enterococcal species (including vancomycin-resistant enterococci) from urine often represents bacteriuria or perineal contamination of the sample, particularly if there are no symptoms of urinary infection and/or no white cells and/or the culture has a mixed range of species present. Patients with immune compromise (e.g. neutropenia), a urinary catheter or recent urological intervention are more likely to have urinary infection due to enterococci. • Empirical use of norfloxacin or ceftriaxone is discouraged. Reserve these agents for directed therapy against pathogens that are resistant to first line agents. • 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). • For other AIMED postings of relevance to urinary infection, see https://aimed.net.au/category/urinary-tract-infections/ .	