

# Antimicrobial Resistance in New Zealand: What is my role in primary care?

This month marks the launch of our 2013 revised edition of "Antibiotic choices for common infections". The guidance supports the goal of preserving the effectiveness of antimicrobial medicines. In the last edition of *Best Practice Journal* we looked at antimicrobial resistance from a global perspective; but what does this mean for general practice in New Zealand? The following commentary has been provided by Dr Rosemary Ikram, Clinical Microbiologist.

## National surveillance of antimicrobial susceptibility

The Antibiotic Reference Laboratory at the Institute of Environmental Science and Research Ltd (ESR) is responsible for collecting national-level data on antimicrobial resistance in New Zealand. This data is obtained from routine and targeted diagnostic susceptibility testing in hospital and community laboratories, testing of isolates referred to ESR and periodic national point-prevalence surveys.

The indicators currently monitored are:

- Extended spectrum  $\beta$  lactamase (ESBL) in enterobacteriaceae – annual survey of isolates submitted to ESR
- Group A streptococci – included in the annual resistance data report
- *Haemophilus influenzae* – data from isolates submitted to ESR from cases of invasive disease; non-invasive disease included in the annual resistance data report
- MRSA – annual report from monthly surveys
- *Neisseria gonorrhoeae* – included in the annual resistance data report
- Salmonella – annual report which also includes comparison of travel associated vs. local isolates as well as human vs. animal isolates
- *Staphylococcus aureus* – included in the annual resistance data report
- *Streptococcus pneumoniae* – invasive isolates included in an annual report on invasive pneumococcal disease; non-invasive isolates included in the annual resistance data report
- Tuberculosis – an annual report, which includes susceptibility data
- Vancomycin-resistant enterococci (VRE) – all laboratories submit isolates for reference testing and an annual report includes susceptibility data

Annual reports on some of the above infectious diseases (MRSA, ESBL in enterobacteriaceae and VRE) also contain epidemiological information, including analysis relating to each DHB region.

There is currently no official method for reporting local resistance, which is important information for prescribing in primary care. There is a significantly higher prevalence of most resistant organisms in the north of the North Island compared to the South Island. On occasions this can be reversed, e.g. in the 1990s the prevalence of penicillin resistance in community isolates of *Streptococcus pneumoniae* was higher in Canterbury than in any other region in New Zealand. Laboratories should be encouraged to produce local data on an annual basis to facilitate optimal empiric prescribing in the community.

## Antimicrobial resistance in primary care

### Urinary tract infection

Antibiotic treatment is indicated for all people who have symptoms of a urinary tract infection (UTI). A urine culture is not required in the case of uncomplicated infection, however, it is recommended that urine culture (and antibiotic susceptibility) is obtained for males, women who are pregnant, children and people who do not respond to empiric antibiotic treatment within two days, as well as those with “complicated” infection (i.e. other than cystitis).

The main pathogens associated with UTI are *Escherichia coli*, *Staphylococcus saprophyticus*, *Proteus spp.*, *Klebsiella spp.* and *Enterococcus spp.* The current recommended antibiotic treatment for uncomplicated cystitis is trimethoprim or nitrofurantoin, with norfloxacin (a quinolone) third-line in infections resistant to the first two choices.

It is recommended that when an organism is reported to have 20% of isolates resistant to an antimicrobial, it is unsuitable as an empiric choice. This is complicated by the fact that local susceptibility data is often lacking and if it is available rates of resistance are over-reported because of the strategy of testing only urine samples from complicated cases. There are also several different species of organism which cause UTI and therefore susceptibility to antibiotic choices varies. When looking at susceptibility to determine empiric choice it is the susceptibility of *E. coli* which is usually considered. With the increasing resistance of urinary pathogens, local sentinel cultures are being requested by some laboratories, i.e. where clinicians are requested to test some uncomplicated cases so that data on local susceptibility can be produced.

The most recent ESR data from 2011 showed that trimethoprim resistance is reported at 24.4%, but nitrofurantoin resistance was encountered in just 1.1% of isolates.<sup>1</sup> This does suggest that trimethoprim is no longer an appropriate first-line empiric choice for UTI, however, as discussed, available resistance data

may not accurately represent uncomplicated infections, and resistance varies locally.

The variation in susceptibility related to geographical area is also illustrated by the rates of ESBL-producing enterobacteriaceae around New Zealand. In the latest report (2012) there has been a 24.3% increase compared to the previous year. The majority of isolates came from the north of the North Island. A large number of these isolates are from the community, and are causing UTI.<sup>2</sup>

### Gonorrhoea

*Neisseria gonorrhoeae* has become increasingly resistant to quinolones (e.g. ciprofloxacin) – resistance was reported at 41% in the 2011 data from ESR.<sup>1</sup> Ceftriaxone is now the treatment of choice even though the susceptibility of some strains is reduced. When treating gonorrhoea, it is important to also include azithromycin treatment for chlamydia infection as they are often concurrent. With the introduction of the new nucleic acid amplification test (NAAT) technology more cases of gonorrhoea will be identified, but currently these tests do not supply susceptibility data. Until such developments become available it will be important to obtain some cultures for susceptibility testing to guide empiric treatment of this infection. This will require discussion between clinicians and their local laboratory.

### *Staphylococcus aureus*

*Staphylococcus aureus* is a frequent cause of skin infections (e.g. bites, cellulitis, impetigo, diabetic foot infections), respiratory infections (e.g. pneumonia), otitis externa and conjunctivitis.

Community methicillin resistant strains (CA-MRSA) are becoming more common; the most recent MRSA data for New Zealand (2012) show that these strains now cause the majority of MRSA infections in this country.<sup>3</sup> The recently reported point prevalence data shows an increase in resistant isolates of 10% between 2011 and 2012.<sup>3</sup> There is considerable variation of prevalence and rate of increase of MRSA between DHB regions, but MRSA is more common in the North Island of New Zealand. Overall, the ESR antimicrobial resistance report shows that 10% of *S. aureus* isolates are resistant to methicillin, i.e. MRSA,<sup>3</sup> but it is important to note that a larger number of isolates from the North Island will have been tested compared to the South.

Strategies to slow the emergence of community bacterial pathogens include:

- Reduce unnecessary antibiotic use

- When antibiotics are used, prescribe the correct dose and duration of treatment
- Educate patients about antibiotic use and expectations for treatment, e.g. when antibiotics are not required
- Implement infection control strategies in all health care settings, including acute hospitals and long-term care facilities

## References

1. Public Health Surveillance. Antimicrobial resistance data from hospital and community laboratories, 2011. Institute of Environmental Science & Research Ltd (ESR); Wellington, 2013. Available from: [www.surv.esr.cri.nz](http://www.surv.esr.cri.nz) (Accessed Jul, 2013).
2. Heffernan H, Woodhouse R. Annual survey of extended-spectrum b-lactamase (ESBL)-producing Enterobacteriaceae, 2012. Institute of Environmental Science & Research Ltd (ESR); Wellington, 2013. Available from: [www.surv.esr.cri.nz](http://www.surv.esr.cri.nz) (Accessed Jul, 2013).
3. Heffernan H, Bakker S. Annual survey of methicillin-resistant Staphylococcus aureus (MRSA), 2012. Institute of Environmental Science & Research Ltd (ESR); Wellington, 2013. Available from: [www.surv.esr.cri.nz](http://www.surv.esr.cri.nz) (Accessed Jul, 2013).

## Antibiotic choices for common infections: what has changed in the 2013 edition?

In 2011, bpac<sup>nz</sup> produced a guide for prescribing antibiotics for common infections seen in primary care. Although published only two years ago, changing resistance patterns and new guidelines for treating infections meant that some areas needed to be updated.

This guidance was revised in consensus with adult and paediatric Infectious Diseases Physicians and a Clinical Microbiologist, to reflect current antimicrobial

susceptibility patterns and best practice evidence. It is intended to aid selection of an appropriate antimicrobial, at the correct dose and duration for patients with infections commonly seen in general practice. Individual patient circumstances and local resistance patterns, however, may alter treatment choices. The guide is also available electronically on our website, and this version will be updated if required.

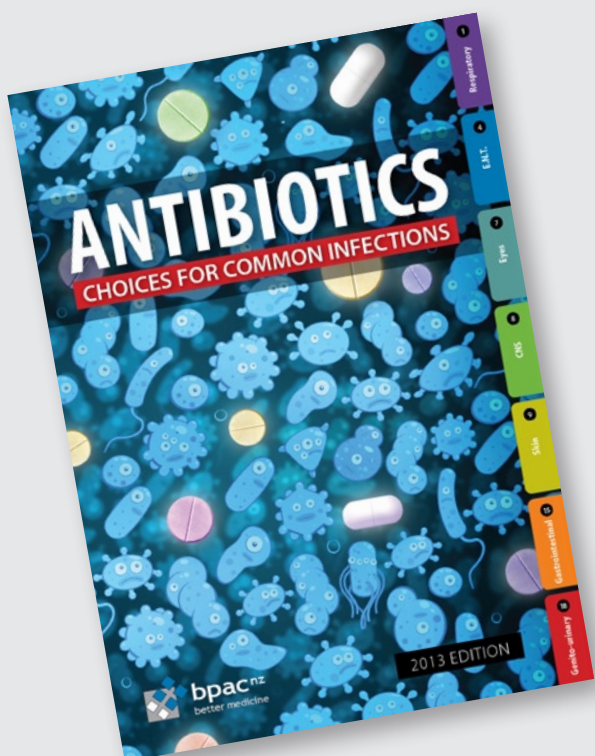
### What are the main differences?

#### Pertussis

Azithromycin is now available, and subsidised (liquid and tablet forms), for the treatment and prophylaxis of pertussis. Azithromycin replaces erythromycin as the recommended first-line treatment and prophylaxis in children. The shorter duration of treatment (five days compared to 14 days with erythromycin) increases adherence. Although azithromycin is an effective option for adults for treatment and prophylaxis of pertussis, erythromycin is preferred first-line as it is important to reserve use of azithromycin, and help to slow the development of resistance.

#### Pneumonia

The first-line treatment for community-acquired pneumonia in adults is amoxicillin. A macrolide antibiotic should be added to the treatment regimen if atypical infection is suspected. Roxithromycin replaces erythromycin as the macrolide of choice, as it is preferred



in respiratory infections, although erythromycin would still be an effective choice. Doxycycline (added to amoxicillin) is an alternative to a macrolide for atypical infections. New guidance from Auckland DHB now recommends a higher dose of doxycycline in patients with pneumonia.

### **Otitis media**

Antibiotic treatment is usually not required for otitis media, however, when indicated, amoxicillin remains the first-line choice. Erythromycin and cefaclor are no longer recommended as second-line choices as they are less preferred to co-trimoxazole in treating otitis media.

### **Sinusitis**

Antibiotic treatment is usually not required for sinusitis as most patients will not have a bacterial infection, however, when indicated, amoxicillin remains the first-line choice. Co-trimoxazole and cefaclor are no longer recommended as second-line choices as they are less preferred to doxycycline in treating sinusitis.

### **Conjunctivitis**

Framycetin is no longer a recommended treatment for conjunctivitis. It was previously a second-line option to chloramphenicol, however, it is only partly subsidised and fusidic acid is a fully subsidised, appropriate alternative second-line treatment.

### **Skin infections**

A new section has been included in the guide on the treatment of recurrent skin infections, including staphylococcal de-colonisation. Cephalexin has been added as an appropriate treatment option for boils, cellulitis, diabetic foot infections, impetigo and mastitis. It can be used as an alternative first-line treatment in children who are unable to tolerate flucloxacillin or as a second-line option for adults. Co-trimoxazole is used to treat skin infections in the community when MRSA is present. Cefaclor is no longer favoured as a second-line alternative in these skin infections, as use must be reserved.

### **Travellers' diarrhoea**

This section is no longer included in the guide as in most cases, antibiotic treatment is not required as the illness is viral or self-limiting. Patients with severe symptoms should be discussed with an Infectious Diseases Physician or Clinical Microbiologist to decide on an appropriate treatment regimen, depending on the causative pathogen.

### **Urinary tract infection**

Two new sections have been included in the guide - UTI in adults and UTI in children, to replace "cystitis". UTI treatment choices remain the same for adults, however, a treatment regimen has now been included for children. Treatment is recommended for seven days in women who are pregnant and in males (previously 10 – 14 days in males).

### **Sexually transmitted and other genital infections**

Antibiotic treatment regimens are based on the recently updated New Zealand Society for Sexual Health guidelines.

Ornidazole is an alternative to metronidazole (if metronidazole is not tolerated) in bacterial vaginosis, pelvic inflammatory disease and trichomoniasis. Ornidazole is reportedly better tolerated than metronidazole, however, it should not be used in women who are pregnant as no study data is available.

Doxycycline is an alternative first-line treatment to azithromycin for chlamydia. Erythromycin is no longer recommended as a second-line option as it is not as effective as other choices for chlamydia.

Amoxicillin clavulanate or co-trimoxazole are now the first-line choices for treating acute pyelonephritis; ciprofloxacin (previous first choice) is a second-line alternative.

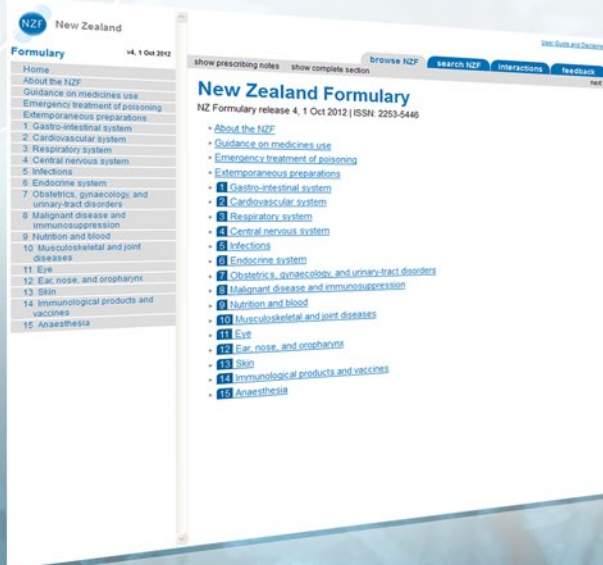
The recommended ceftriaxone dose for gonorrhoea, epididymo-orchitis and pelvic inflammatory disease is now 500 mg IM, stat (previously 250 mg).

# The New Zealand Formulary

- Easily navigated and searchable medicines information.
- Adapted from the British National Formulary incorporating PHARMAC and Medsafe information.
- Additional information from reputable sources (e.g. drug interactions, drugs in pregnancy, breastfeeding).
- Indications and doses reflect current New Zealand practice.
- Updated monthly and freely available to all healthcare professionals within New Zealand.



For an electronic version of the guide see:  
[www.bpac.org.nz/antibiotics](http://www.bpac.org.nz/antibiotics)



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