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**Prescribing
 Practice Review**

**No. 30
 Antibiotics in
 Primary Care**

Dear Dr Sample,

Antibiotics are a valuable resource requiring careful stewardship. This edition of the *Prescribing Practice Review* (PPR) highlights GPs' achievements in reducing antibiotic prescriptions. It also describes strategies for discussing appropriate use with patients and examines some issues in empirical antibiotic therapy. Included are your prescribing data for antibiotics, along with practice points for your review.

Prescribers have become more judicious with antibiotics – has your antibiotic prescribing changed for upper respiratory tract infections (URTIs)?

The downward trend in antibiotic use and increased preference for first-line agents reflects a greater appreciation of the limited role of antibiotics in treating URTIs. To build on this achievement, re-examine your own prescribing to see if you have remaining opportunities to change – the evidence suggests that overall use of antibiotics can be improved further.

Use resources such as symptomatic management pads for URTIs and patient information sheets to help reinforce appropriate prescribing decisions

Patients are increasingly well-informed about the appropriate use of antibiotics, but handling expectations remains difficult. Patient information sheets and symptomatic management pads for URTIs support you in providing therapeutic alternatives and helping patients understand that an antibiotic is not always the best treatment for common infections. The latest addition to the information sheet series, *My child has a middle ear infection*, is enclosed.

Treat confirmed non-severe community-acquired pneumonia using amoxicillin plus either roxithromycin or doxycycline

Empirical dual oral therapy is recommended for most non-severe cases of community-acquired pneumonia. The same therapy is now widely used in hospitals.

Choose first-line antibiotics for the necessary duration in urinary tract infection

The first-line agents for acute cystitis in adults are trimethoprim, cephalexin, amoxicillin+clavulanic acid, or nitrofurantoin. The appropriate length of antibiotic therapy is different for men, women and children, and varies by antibiotic.

The clinical audit *Antibiotic therapy in urinary tract infection* is available as an additional tool to help you review your prescribing. See the insert for enrolment details if you wish to participate.

Yours sincerely,



Dr Stephen Phillips
Chair, National Prescribing Service Limited

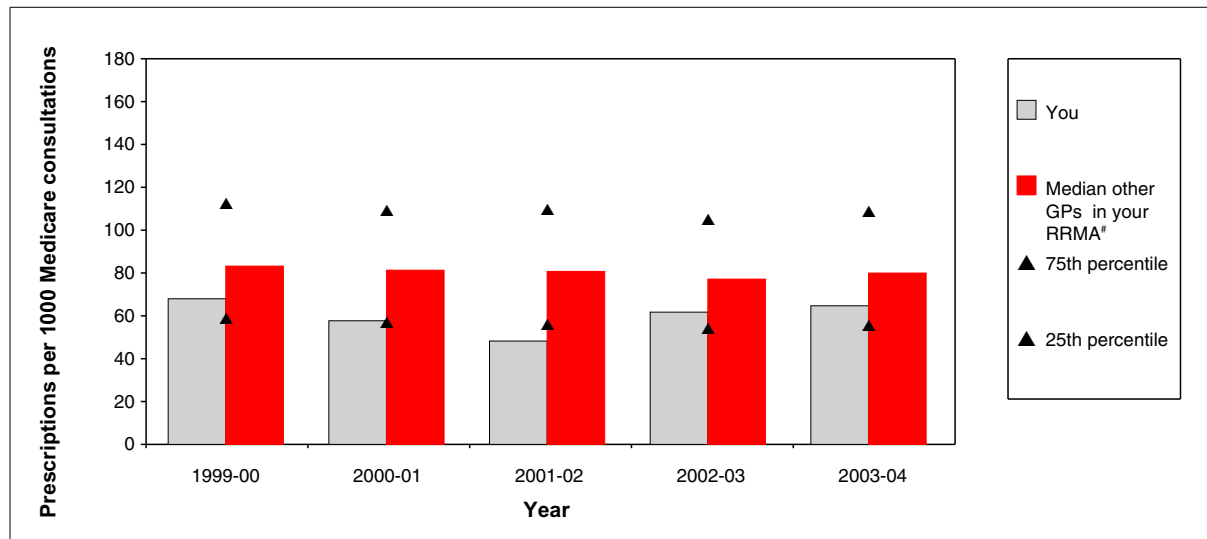


Your confidential prescribing data

The data shown here include all oral antibiotics dispensed for concession card holders and items above the general patient co-payment dispensed for general patients which include azithromycin, ciprofloxacin, enoxacin, fusidic acid, norfloxacin and rifampicin.

In 2003-04, **248** PBS-subsidised prescriptions written by you for oral antibiotics were dispensed for **182** patients.

Total oral antibiotic* use 1999-00 to 2003-04



Practice points

- Nationally there has been a 11% reduction over 5 years in subsidised antibiotic prescriptions written by GPs.
- Has your prescribing of antibiotics decreased over the last 5 years?
- Has your rate of prescribing decreased to the minimum level necessary for appropriate management?

Selected antibiotics as a percentage of total use

Antibiotic	You (%)		Other GPs in your RRMA# (%)	
	2002-03	2003-04	2002-03	2003-04
Amoxicillin	23	28	20	21
Amoxicillin + clavulanic acid	11	16	12	12
Cefaclor	3	2	7	6
Cephalexin	8	9	16	17
Clarithromycin	0	1	3	3
Dicloxacillin	8	6	2	2
Doxycycline	6	6	7	7
Erythromycin	3	0	4	4
Flucloxacillin	1	1	1	1
Phenoxymethylpenicillin	14	13	2	2
Roxithromycin	6	4	11	11
Trimethoprim	4	6	4	4
Trimethoprim + sulfamethoxazole	0	1	2	2
Other**	16	8	9	9

Practice points

- Antibiotic use is improving - GPs are now more commonly choosing the appropriate first-line antibiotics for URIs when an antibiotic is required.
- Second-line agents in RTIs such as amoxicillin+clavulanic acid, cefaclor, cefuroxime, clarithromycin and roxithromycin should represent a small proportion of your prescribing.
- Has your use of second-line agents for RTI decreased?

Prescription repeats for selected oral antibiotics 2003-04

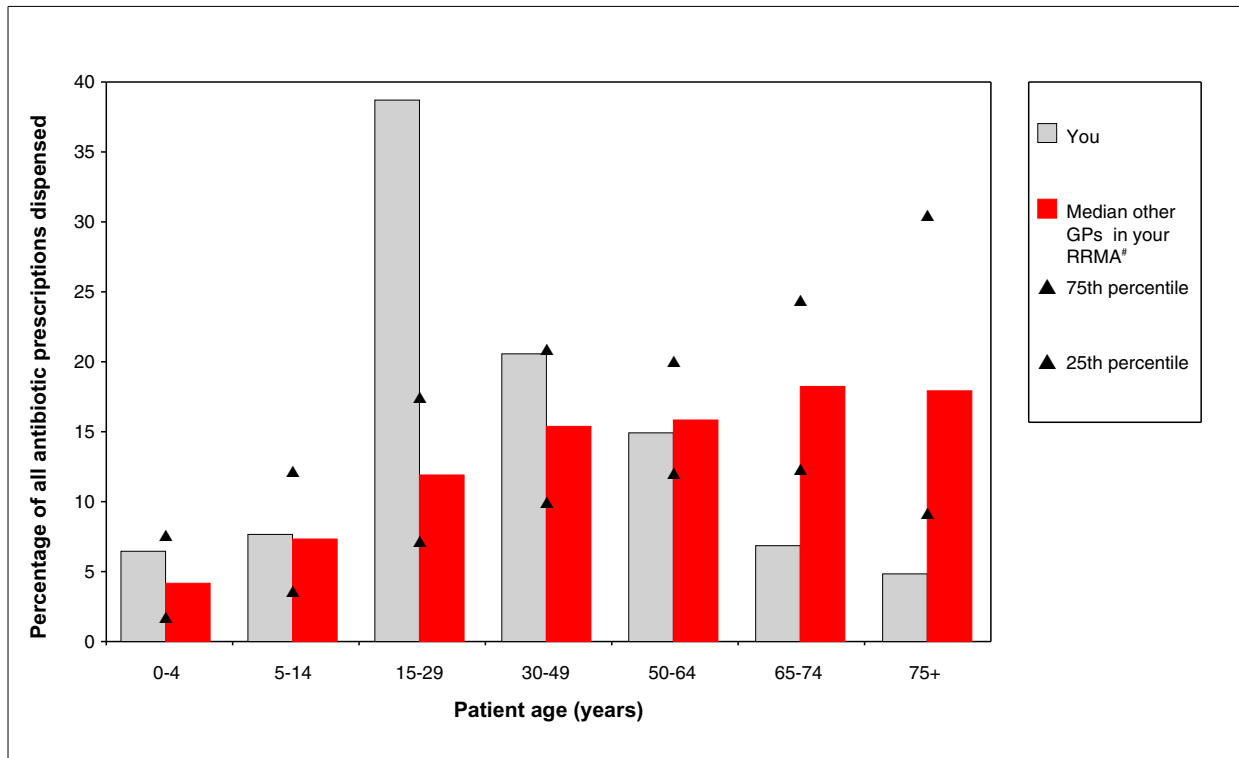
The percentage of repeats dispensed is shown for 13 oral antibiotics most commonly used for URTIs***.

Number of selected oral antibiotic prescriptions 2003-04	Percentage of prescriptions where a repeat was prescribed and dispensed	
You (n)	You (%)	Other GPs in your RRMA# (%)
196	8	21

Practice points

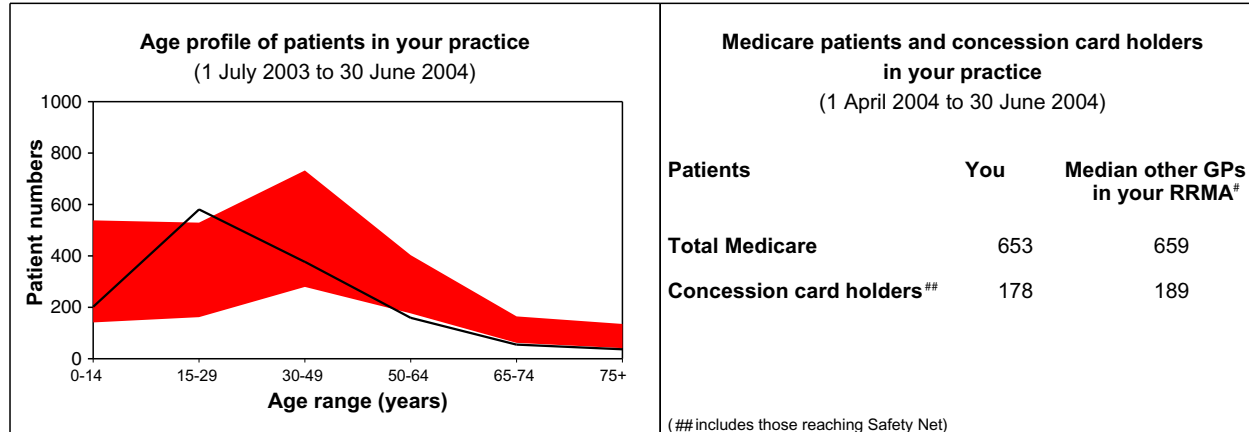
- How often do you order repeats on antibiotic prescriptions for URTIs?
- You can change your software setting to ensure that your patients only receive repeats when you want them. For most UTIs and RTIs the original pack contains adequate supply.
- Refer to Therapeutic Guidelines: Antibiotic¹ for information on recommended duration of treatment.

Percentage total oral antibiotic* prescribing by patient age 2003-04



Practice profile

The data below, based on Medicare claims, are provided to help you review your prescribing data within the profile of your practice. The number of concession card holders given provides an indication of the limitations of the data capture for under co-payment items.



The black line represents the age profile of patients in your practice. 25% to 75% of other GPs in your RRMA# fall within the shaded area.

Data from a three month period (1 April 2004 to 30 June 2004) that best represent your patient mix have been provided.

Notes

@ Data shown are an aggregate for all your provider locations.

* Total oral antibiotic: includes all oral antibiotics on PBS schedule except hexamine hippurate and isoniazid.

The comparator group "other GPs in your RRMA" includes all prescribers who are currently located in a similar geographical region i.e 1. capital cities, 2. other metropolitan centres, 3. large rural centres, 4. small rural centres, 5. other rural centres, 6. remote centres and 7. other remote centres.

Your RRMA peer group is 1.

▲ 25% to 75% of other GPs in your RRMA# fall in the range shown by the triangular symbols.

** Other: ampicillin, azithromycin, cefuroxime, chloramphenicol, ciprofloxacin, clindamycin, cloxacillin, enoxacin, fusidic acid, metronidazole, minocycline, moxifloxacin, nitrofurantoin, norfloxacin, rifampicin, sulfamethizole, tetracycline, tinidazole.

*** Oral antibiotics most commonly used for URTIs: amoxicillin, ampicillin, amoxicillin+clavulanic acid, cefaclor, cefuroxime, cephalexin, clarithromycin, doxycycline 100mg, erythromycin (all salts), phenoxymethylpenicillin, roxithromycin, tetracycline, trimethoprim + sulfamethoxazole; in packs not intended for chronic use or restricted to other indications.

Reference

1. Writing Group for Therapeutic Guidelines: Antibiotic. Therapeutic Guidelines: Antibiotic, Version 12, 2003. North Melbourne: Therapeutic Guidelines Ltd; 2003.

Source: Health Insurance Commission, PBS claims database. Extracted for your personal review only.



National Prescribing Service Limited

PPR

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Prescribing Practice Review—PPR

For Primary Care

Antibiotics in primary care

Key messages

- Prescribers have become more judicious with antibiotics – has your antibiotic prescribing changed for upper respiratory tract infections?
- Use resources such as symptomatic management pads and patient information sheets to help reinforce appropriate prescribing decisions
- Treat confirmed non-severe community-acquired pneumonia using amoxicillin plus either roxithromycin or doxycycline
- Choose first-line antibiotics (trimethoprim, cephalexin, amoxicillin+clavulanate, or nitrofurantoin) for the necessary duration in urinary tract infection

Optimising antibiotic use in upper respiratory tract infections

Has your antibiotic prescribing for upper respiratory tract infections changed?

Prescribing of antibiotics has been falling for some time – from 24 million prescriptions dispensed in the year 1990–91 to 20 million in 2002–03.¹ A large part of this has been reduced prescriptions for upper respiratory tract infection (URTI), where use of an antibiotic is rarely of benefit.² Nonetheless, 35% of GP visits for generalised URTI in 2002–03 ended in a prescription for antibiotics.³

Patients are open to discussions about the role of antibiotics in URTIs

The most recent survey by NPS reveals that 90% of consumers now see use of antibiotics for coughs and colds as having disadvantages, as well as possible advantages⁴ – this suggests that most people are aware that there are both risks and benefits to be weighed up when deciding if an antibiotic is appropriate. Health professionals have an opportunity to inform patients of the risks of antibiotic use, such as adverse effects and bacterial resistance, as well as the benefits.

Consider delayed antibiotic prescription as a strategy to reduce inappropriate antibiotic use

Non-specific URTIs are usually viral and are not altered in their course by antibiotics; acute otitis media, sinusitis and sore throat benefit little from antibiotic therapy, even when bacterial in aetiology. Prescribing symptomatic management is an alternative; however, some patients expect an antibiotic. Recent studies have confirmed that a delayed prescription is effective in reducing use.⁵

Asking patients to wait three or more days and only have antibiotics dispensed if the condition has not improved spontaneously may be useful when there is the expectation of a prescription. When discussion of the advantages and disadvantages of an antibiotic is difficult, delayed prescription may also be an opportunity to begin patient education without confrontation.⁶

Potential disadvantages of delayed prescriptions include patient confusion or a damaged perception of the prescriber.⁷ Some trials have found that while most patients receiving delayed prescriptions were satisfied with their treatment, they were less satisfied than patients receiving immediate prescriptions.^{8,9}

Resources for patients to help with appropriate antibiotic use

For your patients: Middle ear infection information sheet

A new patient information sheet on middle ear infection in children is enclosed for you to copy. The sheet explains the limited role of antibiotics in this condition. An electronic copy is available from the NPS website (www.nps.org.au/healthpro, then the 'Topics and Resources' menu and choose 'Products', then 'Patient materials').

Symptomatic management "prescriptions" help patients with managing URTIs

The NPS *Symptomatic management pad for acute URTIs and acute bronchitis* is available again this year. This assists doctors in explaining to their patients that viral URTIs do not require treatment with antibiotics and that symptoms can be managed in a variety of ways.

The pads in English, Chinese, Italian, Arabic, Vietnamese and Greek are available free-of-charge from NPS.

You can order pads and other patient education brochures by fax using the enclosed form or from the 'health professionals' section of the website www.gottacold.com.

Using prescribing software to review your prescribing of antibiotics

Patients taking antibiotics can be identified using prescribing software packages, i.e. Genie, Locum, Medical Director or Medical Spectrum.

Instructions for searching for your patients on antibiotic therapy within prescribing software programs can be found on the NPS website (www.nps.org.au/healthpro, then the 'Topics and Resources' menu and choose 'Products', then 'Prescribing software guides').

You can use your prescribing software records to help you review the following points:

- Has your prescribing of antibiotics for non-specific URTIs decreased over the last 5 years?
- Has your prescribing of antibiotics for otitis media, sinusitis and tonsillitis decreased over the last 5 years?
- Has your selection of antibiotics changed more towards first-line choices?
- Does your antibiotic choice reflect the likely causative organism(s) for that particular condition?

Treatment of community-acquired pneumonia

Treat non-severe community- acquired pneumonia with empirical dual antibiotic therapy

Suspected pneumonia should be confirmed with a chest X-ray. If the case is not serious enough to warrant hospitalisation (i.e. Pneumonia Severity Index Class I or II – see *NPS News 40*), Australian guidelines recommend empirical dual oral therapy²:

amoxicillin* 1 g 8-hourly for 7 days PLUS EITHER

- doxycycline[†] 200 mg for the first dose, then 100 mg daily for 5 more days
OR
- roxithromycin (Biaxsig, Rulide) 300 mg daily for 7 days

For patients with non-immediate penicillin hypersensitivity

cefuroxime (Zinnat) 500 mg 12-hourly for 7 days (in the place of amoxicillin; with doxycycline or roxithromycin as above)

For patients with immediate penicillin hypersensitivity

gatifloxacin (Tequin)[‡] or moxifloxacin (Avelox)^{††} 400 mg daily for 7 days (as monotherapy)

* Alphamox, Amohexal, Amoxil, Bgramin, Cilamox, Maxamox, Moxacin

† Doryx, Doxsig, Doxy, Doxyhexal, Doxylin, Vibramycin

‡ gatifloxacin is not available on the PBS but is subsidised on the RPBS

†† moxifloxacin is an authority-required PBS listing for community-acquired pneumonia with immediate penicillin hypersensitivity

Dual therapy covers the likely causative pathogens. Most strains of *Streptococcus pneumoniae* seen in Australia are susceptible to high-dose penicillin.¹⁰ Other potential pathogens such as *Mycoplasma pneumoniae* are covered by the macrolide or doxycycline.¹⁰

Reserve cephalosporins and quinolones for patients with penicillin hypersensitivity

Widespread use of newer antibiotics can lead to the early selection of resistance to these agents. The quinolones, gatifloxacin and moxifloxacin, have not proven to be more effective than beta-lactams in non-severe community-acquired pneumonia.¹¹ There are only limited data on the comparative efficacy of gatifloxacin or moxifloxacin in severe community-acquired pneumonia.¹² Keeping our current reserve agents effective is essential.¹³

Community-acquired pneumonia treatment guidelines apply to both hospitals and primary care

Hospital treatment of community-acquired pneumonia is also empirical, unless a specific pathogen is identified or suspected.² Recommended empirical oral therapy in hospitals is the same as that in primary care. This includes patients started on intravenous antibiotics who have been stabilised and switched to oral medication on discharge.²

Treatment of urinary tract infection

Choose the appropriate duration of antibiotic treatment for the type of patient. The length of antibiotic treatment for urinary tract infection (UTI) varies by antibiotic and with pregnancy, sex and age (Table 1). Note that for acute cystitis in non-pregnant women, trimethoprim needs only a 3-day, rather than a 5-day course.

Table 1. Recommended length of antibiotic therapy for acute uncomplicated UTI or pyelonephritis (days)²

	non-pregnant women	pregnant women	men	children (either sex)	acute pyelonephritis* (either sex)
trimethoprim <i>Alprim, Triprim</i>	3	–	14	5	10 [†]
cephalexin <i>Cefalexin, Cilex, Ialex, Ibilex, Keflex, Sporahexal</i>	5	10	14	5	10
amoxicillin+clavulanate <i>Augmentin, Clamohexal, Clamoxyl, Clavulin, Curam, Muric</i>	5	10	14	–	–
nitrofurantoin <i>Macrochantin</i>	5	10	14	–	–
trimethoprim+sulfamethoxazole <i>Bactrim, Resprim, Septrin</i>	–	–	–	5	–
norfloxacin <i>Insensye, Norflohexal, Noroxin, Nufloxib, Roxin</i>	3 [‡]	–	3–14 [‡]	††	–
ciprofloxacin <i>C-Flox, Ciprol, Ciproxin, Profloxin, Proquin</i>	–	–	–	–	10 ^{‡,††}

* serious pyelonephritis requires parenteral treatment, see *Therapeutic Guidelines: Antibiotic*

† avoid in pregnancy

‡ second-line

†† avoid in children unless necessary on microbiological grounds

Quinolones are always second-line treatment in urinary tract infections

Most pathogens are sensitive to the recommended first-line drugs. Reserve quinolones such as norfloxacin and ciprofloxacin for second-line treatment, as they are the only oral drugs available to treat urinary tract infections due to *Pseudomonas aeruginosa* and other multiresistant bacteria.²

Avoid amoxicillin alone in empirical therapy

Organisms cultured from UTIs may be resistant to amoxicillin in half of all cases.¹⁴ Amoxicillin alone should only be used when culture indicates the presence of susceptible organisms.²

Obtain a urine culture when necessary

Empirical therapy is appropriate in most cases. However, a culture is required where there is increased likelihood of microbial resistance or risk of serious infection (Table 2).

Table 2. Patients and cases where urine culture is necessary^{2,14,15}

When symptoms of infection are present in	
• children	• patients with an indwelling catheter
• men	• patients with a known genito-urinary abnormality
• elderly patients	• immunocompromised or diabetic patients
• pregnant women	
Or where there are/is	
• 3 or more episodes per year	• relapse or treatment failure

Do not treat asymptomatic bacteriuria in patients over 60 years of age

The prevalence of asymptomatic bacteriuria may be as high as 50% in some elderly populations; people in aged-care facilities are particularly likely to be affected.¹⁶ Asymptomatic bacteriuria is a benign condition and treatment with antimicrobials does not appear to improve morbidity and mortality.¹⁶ A positive dipstick or culture in the absence of other symptoms is not an indication for antibiotic therapy.¹⁷

Reviewer:

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The information contained in this material is derived from a critical analysis of a wide range of authoritative evidence. Any treatment decisions based on this information should be made in the context of the clinical circumstances of each patient.



National Prescribing Service Limited

National Prescribing Service Limited (NPS) is a member-based organisation providing accurate, balanced, evidence-based information and services to health professionals and the community on Quality Use of Medicines (QUM). To achieve this we work in partnership with GPs, pharmacists, specialists, other health professionals, government, pharmaceutical industry, consumer organisations and the community. NPS is an independent non-profit organisation funded by the Australian Government Department of Health and Ageing.