



National Prescribing Service Limited

Drug Utilisation Briefing
for
Enhanced Divisional Quality Use of Medicine Program

October 2002

Target drug group:	Antibiotics: Focus on oral antibiotics for the management of upper respiratory tract infections and acute bronchitis
NPS related program: (date of delivery)	Management of Upper Respiratory Tract Infections (URTIs) and Acute Bronchitis (ongoing since 1999)

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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 individual clinical circumstances of each patient.*

1. Clinical practice guidelines

Therapeutic Guidelines: Antibiotic Version 11, 2000. electronic version available to subscribers via <http://etg.hcn.net.au/>

- Australian Medicines Handbook (AMH) 2002, 3rd edition.
- *Summaries provided in NPS resources (see below)*

2. NPS resources available

(Available via the NPS website at www.nps.org.au Print copies available on request).

- NPS News 21 (April 2002)
- NPS News 15 (April 2001)
- NPS News 10 (June 2000)
- Prescribing Practice Review, PPR 18 (May 2002)
- Prescribing Practice Review, PPR 12 (June 2001)
- Prescribing Practice Review, PPR 9 (August 2000)
- *PBS prescribing data feedback (last sent May 2002 with PPR 18)
- *Antibiotic Program background material
- *Practice Visits Program detailing card – contains summary of current guidelines
- Clinical audit pack (2002)
- Case studies including results and expert commentaries
 - CS2- Otitis media
 - CS14- Acute sinusitis
 - CS20- Acute bronchitis
- NPS Symptomatic management pad - acute URTIs and acute bronchitis
- NPS patient education materials:
 - I've got a sore throat: will an antibiotic make me better?
 - I've got a troublesome cough: will an antibiotic make me better?
- Complementary medicines and the common cold
- Prescribing software hints for quality prescribing: How to ensure that antibiotics are prescribed without repeats, in your prescribing software

** Only available to Divisions with NPS facilitators for use within their NPS Program and therefore not available via the NPS website.*

3. What's what: Antibiotics used in upper respiratory tract infections (URTIs) and bronchitis

The antibiotics listed below are those that are known to be prescribed for URTIs, although not all are recommended for such use in the Therapeutic Guidelines, Antibiotic.

	Generic	Brand name	PBS codes
Penicillins	amoxycillin	Alphamox [®] , Amohexal [®] , Amoxil [®] , Bgramin [®] , Cilamox [®] , Moxacin [®]	1883D, 1884E, 1889K, 1888J, 1886G, 1887H, 1878W, <i>8581P*</i>
	amoxycillin+clavulanate	Augmentin [®] , Augmentin Duo [®] , Augmentin Duo Forte [®] , Augmentin Duo 400 [®] , Ausclav [®] , Ausclav Duo [®] , Ausclav Duo Forte [®] , Ausclav Duo 400 [®] , Clamoxyl [®] , Clamoxyl Duo [®] , Clamoxyl Duo Forte [®] , Clamoxyl Duo 400 [®] , Clavulin [®] , Clavulin Duo [®] , Clavulin Duo Forte [®] , Clavulin Duo 400 [®]	1891M, 8254K, 1892N, 8319W,
	penicillin V (phenoxymethyl-penicillin)	Abbocillin-V [®] , Cilicaine V [®] , Cilicaine VK [®] , Cilopen VK [®] , LPV [®] , Penhexal [®] , Penhexal VK [®]	1786B, 1787C, 3028J, 1789E, 2965C, 2356B, 2354X <i>1702N, 1703P, 1705R</i>
	procaine penicillin	Cilicaine [®]	1794K
Macrolides	erythromycin	E.E.S [®] , E-Mycin [®] , Eryc [®] , Erythrocin [®]	1400Q, 1404X, 2750R, 2424N, 2428T, 1401R, 2425P, 2610J
	roxithromycin	Biaxsig [®] , Rulide [®] , Rulide D [®]	8129W, 1760P, 8016X
	clarithromycin	Klacid [®]	8318T
Cephalosporins	cefaclor	Ceclor [®] , Ceclor CD [®] , Cefkor [®] , Cefkor CD [®] , Keflor [®] , Keflor CD [®] , Cefaclor-BC	1169M, 2460L, 2461M
	cefuroxime	Zinnat [®]	8292K
	cephalexin	Ceflin [®] , Cilex [®] , Ibilex [®] , Keflex [®] , Cefalexin-BC [®] , Sporahexal [®] ,	3058Y, 3119E, 3094W, 3095X
Tetracyclines	doxycycline	Doryx [®] , Doxig [®] , Doxy-50 [®] , Doxy-100 [®] , Doxyhexal [®] , Doxylin [®] , Vibramycin [®] , Vibra-tabs [®] , Doxycycline-BC [®]	2709N, 2708M <i>2711Q, 2707L, 2702F, 2703G, 2714W, 2715X</i>
	tetracycline	Achromycin [®] , Mysteclin [®] , Tetrex [®]	2134H, 2145X, <i>2135J, 2146Y,</i>
	trimethoprim and sulfamethoxazole (co-trimoxazole)	Bactrim [®] , Bactrim DS [®] , Cosig Forte [®] , Resprim [®] , Resprim Forte [®] , Septrin [®] , Septrin Forte [®] , Trimoxazole-BC 100/160 [®]	2949F, 2951H, 3103H,

* *PBS codes in italics*- restricted benefit for indication other than management of URTI.

Refer to the 'Schedule of Pharmaceutical Benefits for Approved Pharmacists and Medical Practitioners' for PBS Authority requirements and restricted benefit listings

<http://www.health.gov.au/pbs/general/schedule.htm>

4. What do we currently know about prescribing of oral antibiotics for management of URTIs and acute bronchitis

For further information see appendix 1 and PPR 18.

Current data suggests that there is still potential for a reduction in the total use of oral antibiotics for URTIs

- The 2001 BEACH Survey in general practice found that for 49% of encounters, where the reason for presenting was upper respiratory tract infection problems, an antibiotic was prescribed. The percentage had not decreased since 1999.¹
- The rate of antibiotic prescribing for generalised URTI (common cold, acute rhinitis, pharyngitis etc) was found to be just over 30%, a reduction from 37% in 1999. However the rate of antibiotic use for sore throat, acute otitis media and sinusitis had remained high (88%, 77% & 76% respectively).¹
- The PBS dataset shows an annual trend in the volume of antibiotics prescribed with a peak over the winter period. This peak is associated with the use of antibiotics for URTIs and is still present although it has been slowly reducing year on year suggesting a small reduction in the use of antibiotics for self-limiting URTIs.²

The choice of antibiotics in URTI is improving, however first-line drugs were still used in less than half of the encounters when antibiotics were used¹

- Amoxycillin is the recommended first line agent for acute otitis media. Between 1999 and 2001, its use for this indication increased from 33% of presentations where an antibiotic was prescribed to 44% of presentations.¹
- Amoxycillin is also the first line agent for acute sinusitis. Whilst its use for this condition has increased from 15% of presentations to 21% between 1999 and 2001, it is still used in only 1 in 5 presentations.¹
- Penicillin V is the first line agent for tonsillitis / streptococcal sore throat. Use increased from 32% of presentations where an antibiotic was prescribed to 41% of presentations between 1999 and 2001.¹
- Cephalexin was used in 4% of URTIs despite it not providing cover for the most common infecting organisms.¹

Repeat prescriptions

- Repeat prescriptions for antibiotics should only be issued when they are required to supply the recommended duration of therapy, however some software systems default to maximum repeats for all prescriptions. A NSW study found that 63% of patients who received repeats for antibiotics had filled their repeats and repeats were more likely where a script was computer generated.³

The NPS Consumer survey: Evaluating consumer attitudes and behaviours regarding the appropriate use of antibiotics for URTIs (August 2001, n=1,800) showed that:⁴

- 19% of Australians reported that they visited their doctor last time they experienced a cough, cold, sore throat or other flu-like symptom.
- 52% of Australians who went to a doctor for their cough, cold, flu-like symptom reported that they received an antibiotic prescription. This is consistent with previous years (46% for 1999 and 2000).
- Overall 1 in 10 consumers in the survey used an antibiotic the last time they had a cough, cold, sore throat or other flu-like symptom. Again this was consistent with previous years (11% in 1999 and 10% in 2000).

5. Principles of quality prescribing – antibiotics in the management of URTIs and acute bronchitis

Judicious selection of management options

- Antibiotics provide no benefit for viral infections. Uncomplicated URTIs seen in general practice are most often caused by viruses.^{1,2}
- In an immunocompetent adult or child, acute bronchitis is most often viral and does *not* require antibiotic therapy.¹
- Most URTI bacterial infections are self-limiting. Antibiotics are only of benefit in particular subsets of patients with bacterial infections as outlined in Therapeutic Guidelines: Antibiotic.^{1,2}
- The rate of antibiotic prescribing for self-limiting URTIs should be as low as possible and it is thought that the current antibiotic prescribing rate of 50% for people who present with an URTI is too high.³ The management of symptoms is the main focus of treatment for URTIs and should be made explicit to the patient and /or parent.

Appropriate choice of medicines, where a medicine is considered necessary

Refer to the latest edition of the Therapeutic Guidelines: Antibiotic,¹ and the Australian Medicines Handbook (AMH),² for up-to-date recommendations on antibiotic use, doses and durations.

- If an antibiotic is indicated:
 - amoxycillin remains the first line agent for the treatment of acute otitis media and acute sinusitis (unless the patient is hypersensitive to penicillin).^{1,2}
 - phenoxymethylpenicillin (penicillin V) is the first-line agent for the treatment of tonsillitis / streptococcal sore throat (unless the patient is hypersensitive to penicillin).^{1,2}
- Prescribing rates of non first-line agents for URTIs, e.g. amoxycillin + clavulanic acid, cefaclor, clarithromycin, roxithromycin, cefuroxime and ciprofloxacin, should be low.¹
- Co-trimoxazole (trimethoprim + sulphamethoxazole) has no place in the management of URTIs due to its association with significant serious adverse effects.¹
- Cephalexin has no place in the management of URTIs as it does not provide cover for the common infecting organisms.⁴
- Therapeutic Guidelines or AMH dosage recommendations should be used to ensure efficacy and minimise the risk of selection for resistance and minimise the risk of dose related toxicity.^{1,2}
- The generic prescribing of antibiotics or allowing brand substitution will generally reduce the cost of some antibiotics to the patient, as there will be no brand premium.⁵

Safe and effective use

- All beta-lactam antibiotics (including penicillins and cephalosporins) are contraindicated in patients with a history of a type I hypersensitivity reaction (anaphylaxis) to any penicillin, cephalosporin or other beta-lactam antibiotic, thus a careful history of potential drug allergies must be obtained from the patient/carer.^{1,2}
- Prescribe antibiotics for URTIs only when the expected benefits outweigh the risks. The risks of antibiotic therapy include increasing resistance in the individual patient and the community as a whole, adverse drug reactions (*e.g. diarrhoea in general, hepatic reactions with trimethoprim + sulphamethoxazole, serum-sickness reaction with cefaclor*), and drug interactions with current medication (*e.g. antibiotics and the contraceptive pill, macrolides and warfarin, carbamazepine or theophylline*).^{1,2}
- When antibiotics are indicated for bacterial sore throat prescribe a twice daily dosage of penicillin V as this dosage regimen is effective and is associated with better compliance than a four times daily regimen.^{1,2}

- Therapeutic Guidelines or AMH recommendations on duration of therapy should be followed, e.g. 10 days antibiotic treatment is recommended for eradication of *Streptococcus pyogenes* in acute sore throat in specified high risk groups.^{1,2}
- Tetracyclines (doxycycline, tetracycline, oxytetracycline and minocycline) are contra-indicated in pregnant or breast feeding women and children under 8 years old as they cause discoloration of teeth and enamel dysplasia.^{1,2}
- Quinolones (ciprofloxacin, norfloxacin, ofloxacin, gatifloxacin and moxifloxacin) are not recommended for use in children and adolescents, pregnant or breastfeeding women as they have been shown to damage the joints of immature animals.^{1,2}
- Consider the risk of clinically significant drug interactions between regular medication and antibiotics especially in the elderly, the critically ill, those with impaired liver and renal function and those taking multiple medications.
- Repeat prescriptions for antibiotics should only be prescribed if they are required to supply the recommended duration of therapy for the indication.

6. Assisting prescribers to identify 'Quality Prescribing questions'

Evidence suggests that:

- a proportion of current antibiotic use for URTIs and acute bronchitis is unnecessary.
- when antibiotics are indicated, there is potential to increase the use of first line agents relative to other agents.
- agents that offer no advantage over first-line agents should have a limited role.

Decision-making steps

- Step 1:** What are the core **principles of Quality Prescribing**?
Is current prescribing **judicious, appropriate, safe and effective** as outlined on previous page.
- Step 2:** What are the related **Quality Prescribing** questions?
- Step 3:** What are the related **data questions**?
How do we measure and assess current usage against the Quality Prescribing questions?

Putting decision-making steps into practice

Quality prescribing principle:	Quality prescribing questions:	Data questions:
▪ Is current prescribing judicious?	▪ Is the rate of prescribing of antibiotics for self-limiting URTIs too high?	▪ Rate of antibiotic prescribing for all URTI problems overall. ▪ Rate of antibiotic prescribing for specific URTIs (e.g. rhinosinusitis, sore throat/ tonsillitis, otitis media, acute sinusitis, acute bronchitis)?
	▪ Do doctors educate patients about the inappropriate use of antibiotics for self-limiting URTIs? (e.g. via the use of patient education materials, symptomatic prescription pad).	▪ No routine data source currently.

Quality prescribing principle:	Quality prescribing questions:	Data questions:
▪ Is current prescribing appropriate?	▪ When antibiotics are indicated for URTIs, are first-line agents prescribed (unless contraindicated)?	▪ Rate of amoxycillin prescribing for URTIs / acute otitis media / acute sinusitis. ▪ Rate of penicillin V prescribing for sore throat/ tonsillitis.
	▪ Is the prescribing of non-first line agents for URTIs (e.g. amoxycillin + clavulanate, cefaclor, roxithromycin, clarithromycin and ciprofloxacin), or inappropriate agents (eg cephalexin), limited?	▪ Rate of prescribing of non first-line agents for URTIs / acute otitis media / acute sinusitis / sore throat (where first-line agent has not previously been used?). ▪ Rate of cephalexin prescribing for URTI. ▪ Rate of ciprofloxacin prescribing for URTI. ▪ Rate of clarithromycin prescribing for URTI.

Quality prescribing principle:	Quality prescribing questions:	Data questions:
Is current prescribing safe and effective?	Are penicillins or cephalosporins prescribed to patients with a history of type I hypersensitivity reaction to these drugs?	- Percentage of patients whose penicillin allergy status is not recorded. - Rate of penicillin or cephalosporin use in patients with type I penicillin allergy recorded.
	Is the prescribed dosing regimen and duration of therapy in accordance with Therapeutic Guideline recommendations?	Percentage of penicillin V prescriptions for sore throat which are NOT a twice a day dosage for 10 days (NB. Standard Penicillin V PBS quantity is 50 tablets- need to check dosing directions not just quantity prescribed).
	Are repeat antibiotic prescriptions issued when they are not needed for the required duration of therapy?	Percentage of antibiotic prescriptions (for amoxycillin, penicillin V, roxithromycin, cefaclor), which are issued with a repeat.

NOTE: Step 3 is for further development by the ADGP Data Consultancy in consultation with NPS but possible suggestions are included here as examples. The accessibility, interpretation and limitations of these examples all require further investigation.

7. Limitations of PBS data as a data source to review antibiotic prescribing

- Indication for prescribing cannot be determined from the PBS dataset.
- The PBS dataset represents only 50% of total community use of antibiotics.
- Most antibiotics, including the recommended first line agents for URTIs, are below the patient co-payment, therefore the pattern of prescribing for URTIs and the full impact of any changes to antibiotic prescribing for URTIs will not be evident from PBS dataset.
- Knowledge of drug prices relative to the level of co-payment over time is required to interpret the PBS dataset. If the level of co-payment is increased, drugs for general patients that were previously captured by the PBS dataset, may fall below the level of co-payment and therefore no longer be captured for general patients.
- Oral antibiotics above the co-payment in 2002 include azithromycin, ciprofloxacin, fusidic acid, norfloxacin and rifampicin (none of which are agents recommended for use in URTIs).
- Care must be taken in interpreting the PBS dataset for antibiotics for which there are several indications, e.g. amoxycillin + clavulanic acid is not a first line agent for URTIs but is increasingly used for urinary tract infections (UTIs) and this is within current Therapeutic Guideline recommendations. It is also used (inappropriately) for acute bronchitis. Therefore an increase in usage of amoxycillin + clavulanic acid may relate to an increased use for conditions other than URTIs.
- Consider the effects of hospital related prescribing. e.g. injectable antibiotics (ceftriaxone) are unlikely to have been prescribed by a GP. EDQUM divisions have to date been provided with data for GP prescribing only but this may be an issue if sourcing own data from the HIC website if this becomes available.

8. Future developments

- **New drugs**
Two new oral quinolones, gatifloxacin (Tequin®) and moxifloxacin (Avelox®) were recently approved for use in acute bacterial sinusitis, although as at October 2002 they are not currently listed on the PBS for this indication. Resistance to these antibiotics has already been identified. In general, quinolones have no place in the treatment of URTIs unless advised by specialist microbiologist.
- **Potential changes in Therapeutic Guidelines recommendations**
Therapeutic Guidelines: Antibiotic Version 12 will be published in April 2003. Significant changes to the URTI chapter are not expected. Changes are expected to the recommendations for the treatment of community-acquired pneumonia.

9. Indicators of quality prescribing under development

To follow.

- Will include a link to an indication for therapy.

10. Potential changes in prescribing if principles of good prescribing are followed

To follow.

11. Cost comparison for antibiotics prescribed for URTIs and pharmacoeconomic considerations

To follow.

12. References

What do we currently know about prescribing of antibiotics in the management of URTIs?

1. Data provided by the AIHW General Practice Statistics and Classification Unit, Family Medicine Research Centre, University of Sydney, from the BEACH program. January- December 2001.
2. Health Insurance Commission, PBS claims database.
3. Newby D, Fryer J, Henry D, Prior F. Automatic repeats: a possible negative impact on antibiotic use. Final Report to the National Prescribing Service Ltd. Newcastle: University of Newcastle, October 2001.
4. National Prescribing Service. NPS programs for QUM in the Community, Evaluation report No. 4.

Principles of quality prescribing – antibiotics in the management of URTIs

1. Therapeutic Guidelines Antibiotic Version 11 2000. North Melbourne: Therapeutic Guidelines Ltd 2000 (electronic version available to subscribers via <http://etg.hcn.net.au/>)
2. Australian Medicines Handbook, 2002, 3rd edition. Adelaide, Australian Medicines Handbook Pty Ltd, 2002.
3. Turnidge J, Responsible prescribing for URTIs. Curr Ther, July 2002 50-59.
4. Australian Medicines Handbook, 2000. 2nd edition. Adelaide, Australian Medicines Handbook Pty Ltd, 2000.
5. Schedule of Pharmaceutical Benefits for Approved Pharmacists and Medical Practitioners. 1 November 2002, Commonwealth Department of Health and Ageing.

Appendix 1

Patterns of oral antibiotic prescribing for URTIs in the BEACH Survey

(Further information).

- **Rate of antibiotic prescribing for URTIs**

The overall prescribing rate for antibiotics seen in the BEACH survey of 2001 remains the same as found in 1999. In 2001 an antibiotic was prescribed for 49% of patient encounters for URTIs, the same as the rate of 50% seen in 1999 (Table 1).

Table 1: Rate of antibiotic prescribing

Upper respiratory tract infection problems	Rate of antibiotic prescribing % 1999	Rate of antibiotic prescribing % 2001
Generalised URTI (common cold, acute rhinitis, pharyngitis etc.)	37.0	31.5
Laryngitis/tracheitis	30.7	33.6
Acute tonsillitis/streptococcal sore throat	88.6	88.7
Acute otitis media	72.9	76.6
Sinusitis (acute and chronic)	70.8	76.4
Other	26.0	22.3
Total	50.3	49.0

- **Appropriate selection of antibiotics when an antibiotic is required**

There are indications that GPs are more often prescribing first-line agents in URTIs.

- Overall amoxycillin is the most commonly prescribed antibiotic in URTI (Table 2).
- It is surprising to continue to see use of cephalexin in 4% of encounters for URTI in 2001 since it does not provide cover for the common infecting organisms.

Table 2: Selection of antibiotics in URTI overall

Most commonly prescribed antibiotics	1999 %	2001 %
Amoxycillin	28.7	32.5
Cefaclor	15.8	13.4
Roxithromycin	13.4	11.6
Amoxycillin + clavulanate	11.2	12.5
Phenoxymethylpenicillin	7.6	10.6

Tables 3 - 7 Selection of antibiotics by condition

See shaded areas for first line therapy



= First line therapy when antibiotic indicated



= Indicates alternatives in the patient who is hypersensitive to penicillin

Table 3: Selection of antibiotics for acute otitis media

Most commonly prescribed antibiotics	1999 %	2001 %	Comment
Amoxycillin	32.8	43.9	Antibiotics may not be required for all patients Amoxycillin is first-line therapy in these patients
Cefaclor	32.1	25	
Amoxycillin + clavulanate	18.2	17.8	
Co-trimoxazole	6.2	2.6	
Cephalexin	3.3	4.5	
Erythromycin	3.2	2.6	
Roxithromycin	2.9	2.1	

Table 4: Selection of antibiotics for sinusitis – acute and chronic

Most commonly prescribed antibiotics	1999 %	2001 %	Comment
Amoxycillin	15.0	20.8	Antibiotics recommended for severe cases only Amoxycillin is first line therapy in these patients
Amoxycillin + clavulanate	16.2	20.7	
Roxithromycin	21.2	18.3	
Doxycycline	16.6	13.2	
Cefaclor	14.5	11.5	
Clarithromycin	1.5	4.0	
Cephalexin	4.6	3.8	
Co-trimoxazole	2.3	2.7	
Erythromycin	2.4	1.5	
Cefuroxime	4.5	1.2	

Table 5: Selection of antibiotics for tonsillitis and streptococcal sore throat

Most commonly prescribed antibiotics	1999 %	2001 %	Comment
Penicillin V	31.7	40.4	Antibiotics recommended for severe tonsillitis and selected patients at risk of rheumatic fever only. Penicillin V is first-line therapy in these patients.
Amoxycillin	29.5	29.6	
Amoxycillin + clavulanate	5.8	7.3	
Roxithromycin	4.4	2.7	
Procaine penicillin	3.5	2.7	
Cefaclor	6.4	5.6	
Cephalexin	4.8	3.0	
Co-trimoxazole	1.4	0.8	
Erythromycin	5.5	5.0	
Other	7.0	2.9	

Table 6: Selection of antibiotics for laryngitis / tracheitis

Most commonly prescribed antibiotics	1999 %	2001 %	Comment
Amoxycillin	28.9	36.1	Most cases are viral illnesses
Roxithromycin	21.9	19.6	
Amoxycillin/clavulanate	10.5	12.4	
Cefaclor	11.4	8.3	
Erythromycin	3.5	7.2	
Doxycycline	11.4	4.1	
Cephalexin	3.5	2.0	
Cefuroxime	4.4	2.0	
Penicillin V	1.8	2.0	
Clarithromycin	0.9	2.0	
Co-trimoxazole	1.8	0	

Table 7: Selection of antibiotics for acute bronchitis/bronchiolitis/chronic bronchitis

Most commonly prescribed antibiotics	1999 (data not available)	2001 %	Comment
Amoxycillin		24.4	Acute bronchitis is most often viral and does not require antibiotic therapy.
Roxithromycin		23	
Amoxycillin + clavulanate		14.5	
Cefaclor		10.3	
Doxycycline		8.1	
Erythromycin		7.0	
Cephalexin		5.5	
Clarithromycin		3.6	

Reference:

University of Sydney. Data provided by the AIHW General Practice Statistics and Classification Unit, Family Medicine Research Centre, University of Sydney, from the BEACH program. January-December 1999 and January-December 2001.

Appendix 2

Pharmaceutical Benefits Pricing Authority. Therapeutic Relativity Sheets.

(available on line at <http://www.health.gov.au/pbs/pricing/therelativity.pdf>)

Relativity Sheets show specific relativities and pricing comparisons between drugs within a therapeutic group. The relativities are usually based on PBAC advice but may also be historically based.

PHARMACEUTICAL BENEFITS PRICING AUTHORITY

Therapeutic Relativity Sheets

ATC J01 – ANTIBACTERIALS FOR SYSTEMIC USE	Effective Date: 04/02	PAGE 1 OF 2
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1. Doxycycline and minocycline are similar tetracyclines and when used for acute infection, may be considered clinically equivalent (in appropriate dosages).
2. In relation to the use of minocycline in acne the PBAC has accepted that it has similar efficacy to other tetracyclines. However, listing of the 50mg tablet was accepted at a price relative to the 100mg minocycline capsule.
3. Phenoxymethylpenicillin was the first widely used oral penicillin and was, historically, the cheapest of the penicillins. However, since October 1995 the pricing has been allowed to increase to the same level as amoxycillin.
4. Ampicillin has a wider antimicrobial activity than phenoxymethylpenicillin and until the PBPA meeting in October 1995 enjoyed a premium over that drug. Prior to the minimum pricing policy it was priced under the amoxycillin price (see 5 below).
5. Amoxycillin is similar in activity to ampicillin but is better absorbed orally and was initially listed with a premium over ampicillin (i.e. until the generic pricing policy and the Minimum Pricing Policy).
6. Amoxycillin with clavulanic acid was accepted by the PBAC as being a 'significant advance' over amoxycillin and thus has always attracted a 'significant' premium over plain amoxycillin.
7. Amoxycillin powder for paediatric drops has been compared relative to amoxycillin powder for syrup 125mg per 5ml.
8. Cephalexin is a first generation cephalosporin. It has a different spectrum of activity to amoxycillin but, as far as the PBAC is concerned, as used in general clinical practice, it is used in the same way and for pricing purposes should be considered as clinically equivalent to amoxycillin.
9. The PBAC has accepted that, in general, cefaclor capsule 750mg daily has similar efficacy to amoxycillin 750mg in combination with clavulanic acid daily. However, in relation to a specific use, in lower respiratory tract infection, the PBAC has accepted that cefaclor capsule 750mg is approximately clinically equivalent to amoxycillin 1.5g in combination with clavulanic acid daily.
10. Since listing, ceftriaxone has been accepted as being approximately 3 times the potency of cefotaxime. This ratio was confirmed by the PBAC in 1991.

PHARMACEUTICAL BENEFITS PRICING AUTHORITY

Therapeutic Relativity Sheets

ATC J01 – ANTIBACTERIALS FOR SYSTEMIC USE (continued)	Effective Date: 04/02	PAGE 2 OF 2
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11. Cefotetan was accepted for listing by the PBAC with the advice that it had similar clinical use to ceftriaxone (and cefotaxime). The dosage comparison is cefotetan 1 or 2 grams 12 hourly compares to ceftriaxone 1 or 2 grams daily. That is: - ceftriaxone approximately 3 times potency of cefotaxime - cefotetan 2 to 4 grams/day compares to ceftriaxone 1 - 2 grams/day.
12. For pricing purposes trimethoprim with sulphamethoxazole tablet 160mg - 800mg has generally been compared with amoxycillin 250mg. (Both used as first line antibiotics).
13. Eryc (erythromycin) capsule 175mg has been accepted as being bioequivalent to other erythromycin 250mg capsules.
14. Eryc 250mg has been accepted as being clinically equivalent to erythromycin ethyl succinate 400mg.
15. Roxithromycin was recommended for listing by the PBAC with the advice that 150mg roxithromycin twice daily offers a small advantage compared to erythromycin 500mg four times daily.
16. Erythromycin ethyl succinate granules for suspension 400mg per 5mL has been accepted as being equivalent to the 250mg per 5mL stearate suspension.
17. Dicloxacillin was accepted for listing on the basis of cost minimisation (same price) compared to flucloxacillin.
18. Cefuroxime was listed on the basis of cost minimisation compared to cefaclor with pricing based on 14 x 250 mg tablets being the same as 10 x 375 mg cefaclor.
19. Clarithromycin tablet 250mg was recommended for listing as an unrestricted benefit on the basis of pack per pack compared to roxithromycin tablet 150mg ie. five days of roxithromycin (at 150mg twice daily) = seven days of clarithromycin (at 250mg twice daily). The actual price is based on a weighting between use as an unrestricted benefit and use for the treatment of MAC (Section 100).
20. Cefepime was recommended by the PBAC on the basis of equivalence with ceftazidime (non-PBS). The Pricing Authority recommended pricing based on a small premium over ceftriaxone (4g cefepime daily compared with 2g ceftriaxone daily).
21. *Amoxycillin tablet 1g was recommended for listing on the basis that 1g twice daily provides similar safety and efficacy to 500mg three times daily.*