Therapeutic Guidelines

Antibiotic prescribing in primary care: Therapeutic Guidelines summary table 2023

This table summarises information in ***Therapeutic Guidelines*** about the management of common conditions in primary care. For detailed and up-to-date information, including **second-line treatment options** and management of **special patient groups** (eg penicillin hypersensitivity, renal impairment), see *Therapeutic Guidelines*.

This table should be used in conjunction with **clinical judgement**. Prescribers should consider the **harm–benefit profile** of a drug in each patient (eg consider potential drug interactions, risk of adverse effects).

Antibiotics that are **overused** in primary care include **amoxicillin+clavulanate, cefalexin, cefaclor, roxithromycin** and **erythromycin.**

For indications not covered in the primary care summary table, see *Therapeutic Guidelines*.

Links to indications covered in the table

May 2023—Temporary advice to address multiple concurrent shortages of first-line antibiotics

Many antimicrobials are currently in short supply. Alternative antibiotics have been included in this table that may be considered for an individual patient when first-line treatment is unavailable. Only consider prescribing the listed alternatives if first-line treatment is unavailable as the alternatives may be **less efficacious**, have a **suboptimal spectrum of activity** and have a **less favourable harm–benefit profile**.

Alternative antibiotics for each condition are listed in order of preference based on antimicrobial stewardship principles; the decision on which alternative antibiotic to use in an individual patient depends on availability and patient-specific factors.

Outside of a shortage situation, refer to *Therapeutic Guidelines* for second-line treatment options and management of special patient groups (eg penicillin hypersensitivity, renal impairment).

Considerations before prescribing an alternative to first-line treatment

Antimicrobial shortages are rapidly changing and vary between regions and settings. **Before prescribing an alternative to first-line treatment**, check if:

- the first-line antimicrobial is in shortage on the Therapeutic Goods Administration medicine shortage reports database
- the patient's local pharmacy has stock.

If first-line treatment is not available, consider:

- **alternative formulations of first-line antimicrobials** (eg use of tablets or capsules in children—see 'Suitability of crushing or dispersing oral solid-dose formulations for administration to children' below). Serious Scarcity Substitution Instruments (SSSIs) are currently available for some antibiotics that allow an oral solid-dose formulation of the drug to be substituted by the pharmacist when an oral liquid formulation has been prescribed.
- **alternative access pathways** (eg accessing products not registered for use in Australia through Section 19A of the *Therapeutic Goods Act 1989* or the Special Access Scheme). A list of currently approved Section 19A medicines, and the relevant wholesalers, is available on the Therapeutic Goods Administration website.

Other resources

For other general guidance on managing antimicrobial shortages, see Antimicrobial Shortages - Clinician Guidance factsheet from the Australian Commission on Safety and Quality in Health Care.

For indications not covered in the primary care summary table, see *Therapeutic Guidelines* for alternatives to first-line treatment. For drug-specific factsheets on patient management in a shortage situation, see the National Centre for Antimicrobial Stewardship website.

Suitability of crushing or dispersing oral solid-dose formulations for administration to children

Some antibiotics recommended in the table for use in children are not commercially available in an oral liquid formulation or the oral liquid formulation is in shortage. To enable administration in children, it may be feasible to crush or disperse oral solid-dose formulations of antibiotics. Considerations in this decision include:

- **the suitability of the oral solid-dose formulation for crushing or dispersing**—seek advice from the local pharmacist; see also Summary guide to suitability of some antibiotic formulations for crushing or dispersing at the end of this document. This information is based on advice in *Don't Rush to Crush*, published by The Society of Hospital Pharmacists of Australia
- **the ability of carers to perform preparation steps**
- **patient acceptability**—some antibiotics taste bitter and administration with a small amount of yoghurt or apple puree may be helpful
- **practicality of dosing**—consider rounding the dose to whole tablets or capsules as not all oral solid-dose formulations are appropriate to crush or disperse to obtain doses that are less than a whole tablet or capsule. Some tablet formulations may be suitable to portion into quarters or halves, which can be crushed or dispersed and administered. For advice on part dosing, see *Don't Rush to Crush*
- **the risk of doses being partially administered** (eg through loss during preparation steps or patient refusal).

Indication	First-line treatment	Notes	Alternative if first-line treatment is not available For general guidance on managing antimicrobial shortages, see here.
acute rhinosinusitis	symptomatic treatment	Antibiotic treatment is required rarely—most cases are viral. See *Therapeutic Guidelines* for more information and resources to support discussion with the patient or carer.	symptomatic treatment
acute otitis media in children	symptomatic treatment for most children	80% of cases spontaneously resolve without antibiotic treatment. Advise the carer to return if symptoms do not improve within 72 hours. Consider a delayed prescription for antibiotic therapy. Treat the following groups: • infants younger than 6 months • children younger than 2 years with bilateral infection • children who are systemically unwell (eg lethargic, pale; fever alone is not sufficient) • children with otorrhoea • Aboriginal and Torres Strait Islander children • children at high risk of complications (eg immunocompromised children). Amoxicillin is first-line treatment for these groups: **amoxicillin** 15 mg/kg up to 500 mg orally, 8-hourly for 5 days See *Therapeutic Guidelines* for resources to support discussion with the patient or carer.	symptomatic treatment for most children if antibiotic therapy is indicated and amoxicillin is not available, alternative options (in order of preference) include: **cefuroxime** (child 3 months or older) 15 mg/kg up to 500 mg orally, 12-hourly for 5 days OR **cefalexin** 12.5 mg/kg up to 500 mg orally, 6-hourly for 5 days OR **trimethoprim+sulfamethoxazole** (child 1 month or older) 4+20 mg/kg up to 160+800 mg orally, 12-hourly for 5 days OR **amoxicillin+clavulanate** infant 1 month to younger than 2 months: 15+3.75 mg/kg orally, 8-hourly for 5 days child 2 months or older: 22.5+3.2 mg/kg up to 875+125 mg orally, 12-hourly for 5 days
acute pharyngitis/ tonsillitis	**patients *not* at high risk of acute rheumatic fever:** symptomatic treatment for most cases **patients at high risk of acute rheumatic fever:** **phenoxymethylpenicillin** 500 mg (child: 15 mg/kg up to 500 mg) orally, 12-hourly for 10 days OR **benzathine benzylpenicillin** intramuscularly, as a single dose adult: 1.2 million units (2.3 mL) child less than 10 kg: 0.45 million units (0.9 mL) child 10 kg to less than 20 kg: 0.6 million units (1.2 mL) child 20 kg or more: 1.2 million units (2.3 mL)	Most cases are viral. In patients not at high risk of acute rheumatic fever, even if infection is bacterial, antibiotic treatment is of limited benefit. See *Therapeutic Guidelines* for resources to support discussion with the patient or carer. In patients at high risk of acute rheumatic fever, antibiotic treatment is recommended for all patients because the increased risk of acute rheumatic fever and resultant rheumatic heart disease outweighs the risk of harms from potentially unnecessary antibiotic treatment. See *Therapeutic Guidelines* for assessment of risk of acute rheumatic fever.	**patients *not* at high risk of acute rheumatic fever:** symptomatic treatment for most cases **patients at high risk of acute rheumatic fever:** if phenoxymethylpenicillin is not available and benzathine benzylpenicillin is not preferred, alternative options (in order of preference) include: **amoxicillin** 1 g (child: 50 mg/kg up to 1 g) orally, daily for 10 days OR **cefalexin** 1 g (child: 25 mg/kg up to 1 g) orally, 12-hourly for 10 days OR **cefuroxime** 500 mg (child 3 months or older: 15 mg/kg up to 500 mg) orally, 12-hourly for 10 days
acute bronchitis	symptomatic treatment	Antibiotic treatment is **not** indicated—over 90% of cases are viral. See *Therapeutic Guidelines* for resources to support discussion with the patient or carer.	symptomatic treatment

Indication	First-line treatment	Notes	Alternative if first-line treatment is not available For general guidance on managing antimicrobial shortages, see here.
COPD exacerbation where antibiotics are indicated	**amoxicillin** 500 mg orally, 8-hourly for 5 days OR **doxycycline** 100 mg orally, daily for 5 days	Antibiotic treatment has **little benefit** for patients managed in the community with less severe COPD: for every 100 patients treated with antibiotics, only 8 patients will be better by 4 weeks because they took antibiotics. Consider a delayed prescription for antibiotic therapy. See *Therapeutic Guidelines* for more information and resources to support discussion with the patient or carer.	if amoxicillin and doxycycline are not available, alternative options (in order of preference) include: **cefuroxime** 500 mg orally, 12-hourly for 5 days OR **amoxicillin+clavulanate** 875+125 mg orally, 12-hourly for 5 days
community-acquired pneumonia in children 2 months or older: low-severity (mild)	**amoxicillin** 25 mg/kg up to 1 g orally, 8-hourly for 3 days	Viruses are the main cause of community-acquired pneumonia in children 2 months or older, but clinical features do not reliably distinguish between viral and bacterial pathogens. Children who have widespread pulmonary wheeze or crackles but no focal changes on chest X-ray are more likely to have viral pneumonia. Consider performing NAAT (eg PCR) to detect respiratory viruses. If a viral cause is suspected or confirmed, symptomatic treatment alone is recommended. For risk factors for infection caused by *Chlamydia trachomatis* and adjustment of empirical therapy, see *Therapeutic Guidelines*. If the patient is not improving after 48 to 72 hours, or symptoms worsen at any time, reassess the diagnosis—see *Therapeutic Guidelines*.	if amoxicillin is not available, alternative options (in order of preference) include: **cefuroxime** (child 3 months or older) 15 mg/kg up to 500 mg orally, 12-hourly for 3 days OR **azithromycin** 10 mg/kg up to 500 mg orally, daily for 3 days OR **clarithromycin** 7.5 mg/kg up to 500 mg orally, 12-hourly for 3 days OR **doxycycline** orally, 12-hourly for 3 days child 8 years or older and less than 26 kg: 50 mg child 8 years or older and 26 to 35 kg: 75 mg child 8 years or older and more than 35 kg: 100 mg
community-acquired pneumonia in adults: low-severity (mild)	**amoxicillin** 1 g orally, 8-hourly; see Notes column for duration of therapy	Assess the patient's pneumonia severity, comorbidities and social circumstances to decide whether to admit the patient to hospital—see *Therapeutic Guidelines*. For risk factors for infection caused by atypical bacteria and adjustment of empirical therapy, see *Therapeutic Guidelines*. **Patient review** within 48 hours is essential. If the patient has significantly improved after 2 to 3 days, treat for 5 days. If the clinical response is slow, treat for 7 days. If the patient is not improving after 48 hours of monotherapy, see *Therapeutic Guidelines*. If patient follow-up within 48 hours may not occur, consider using initial combination therapy with amoxicillin plus doxycycline instead—see *Therapeutic Guidelines*.	if amoxicillin is not available, alternative options (in order of preference) include: **doxycycline** 100 mg orally, 12-hourly OR **clarithromycin** 500 mg orally, 12-hourly OR **cefuroxime** 500 mg orally, 12-hourly see Notes column for duration of therapy
community-acquired pneumonia in residents of aged-care facilities: oral therapy	**amoxicillin** 1 g orally, 8-hourly; see Notes column for duration of therapy	Consider whether a viral infection could be the cause of symptoms. See *Therapeutic Guidelines* for indications for parenteral therapy. If infection caused by atypical bacteria (eg *Legionella* species) is suspected, see *Therapeutic Guidelines*. **Patient review** within 48 hours is essential. If the patient has significantly improved after 2 to 3 days, treat for 5 days. If the clinical response is slow, treat for 7 days. See *Therapeutic Guidelines* if the patient is not improving.	if amoxicillin is not available, alternative options (in order of preference) include: **doxycycline** 100 mg orally, 12-hourly OR **cefuroxime** 500 mg orally, 12-hourly OR **amoxicillin+clavulanate** 875+125 mg orally, 12-hourly see Notes column for duration of therapy

Indication	First-line treatment	Notes	Alternative if first-line treatment is not available For general guidance on managing antimicrobial shortages, see here.
localised odontogenic infection	dental treatment	Prescribe analgesia and **refer** the patient to the dentist. Explain that antibiotic treatment without dental intervention will not be effective. If dental treatment will be delayed or the infection is spreading, see *Therapeutic Guidelines*.	dental treatment
acute cystitis in nonpregnant women	**trimethoprim** 300 mg orally, daily for 3 days	Half of cases in nonpregnant women younger than 65 years resolve within 7 days without antibiotic treatment. See *Therapeutic Guidelines* for indications for taking a urine sample for culture and susceptibility testing. Do **not** use ciprofloxacin, norfloxacin or fosfomycin unless susceptibility testing rules out all alternative antibiotics—see *Therapeutic Guidelines*.	if trimethoprim is not available, alternative options (in order of preference) include: **nitrofurantoin** 100 mg orally, 6-hourly for 5 days OR **cefalexin** 500 mg orally, 12-hourly for 5 days OR **trimethoprim+sulfamethoxazole** 160+800 mg orally, 12-hourly for 3 days
acute cystitis in pregnancy	**nitrofurantoin** 100 mg orally, 6-hourly for 5 days	Take a urine sample for culture and susceptibility testing before starting treatment, and repeat 1 to 2 weeks after treatment is completed. Avoid using nitrofurantoin close to delivery—see *Therapeutic Guidelines*.	nitrofurantoin is not in shortage at the time of writing
infected bites and other wounds caused by teeth (including human, cat, dog)	**amoxicillin+clavulanate** 875+125 mg (child 2 months or older: 22.5+3.2 mg/kg up to 875+125 mg) orally, 12-hourly for 5 days	The recommended management of bites and clenched-fist injuries is thorough cleaning, irrigation, debridement, elevation and immobilisation. Check the patient's tetanus immunisation status. Antibiotic treatment may **not** be required if the wound is not infected—see *Therapeutic Guidelines*. Initial intravenous therapy is needed for bite or clenched-fist injury infection associated with systemic features or involving deeper tissues (such as bones, joints, or tendons)—see *Therapeutic Guidelines*.	if amoxicillin+clavulanate is not available, alternative options (in order of preference) include: **metronidazole** 400 mg (child: 10 mg/kg up to 400 mg) orally, 12-hourly for 5 days PLUS EITHER **doxycycline** orally, 12-hourly for 5 days adult: 100 mg child 8 years or older and less than 26 kg: 50 mg child 8 years or older and 26 to 35 kg: 75 mg child 8 years or older and more than 35 kg: 100 mg OR **trimethoprim+sulfamethoxazole** 160+800 mg (child 1 month or older: 4+20 mg/kg up to 160+800 mg) orally, 12-hourly for 5 days OR as combination therapy **ciprofloxacin** 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 12-hourly for 5 days PLUS **clindamycin** 450 mg (child: 10 mg/kg up to 450 mg) orally, 8-hourly for 5 days OR as a single drug **moxifloxacin** 400 mg (child: 10 mg/kg up to 400 mg) orally, daily for 5 days

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erysipelas without systemic symptoms	**phenoxymethylpenicillin** 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days	Initial intravenous therapy is needed if the patient has **2 or more** systemic symptoms—see *Therapeutic Guidelines*.	if phenoxymethylpenicillin is not available, alternative options include:
			dicloxacillin 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days
			OR
			flucloxacillin 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days
			
			if neither dicloxacillin nor flucloxacillin is available, alternative options (in order of preference) include:
			cefalexin 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days
			OR
			clindamycin 450 mg (child: 10 mg/kg up to 450 mg) orally, 8-hourly for 5 days

cellulitis without systemic symptoms	**if *Streptococcus pyogenes* is suspected based on clinical presentation:** **phenoxymethylpenicillin** 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days **if *Staphylococcus aureus* is suspected based on clinical presentation:** **dicloxacillin** 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days OR **flucloxacillin** 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days	*Streptococcus* species are the most common cause of nonpurulent, recurrent cellulitis and spontaneous, rapidly spreading cellulitis. *Staphylococcus aureus* is often associated with penetrating trauma or ulceration. Purulent cellulitis (eg associated abscess, furuncle) is typically caused by *S. aureus*. See *Therapeutic Guidelines* for management if the wound was exposed to fresh or salt water or there is a risk of MRSA. Initial intravenous therapy is needed if the patient has **2 or more** systemic symptoms—see *Therapeutic Guidelines*. See *Therapeutic Guidelines* for the management of periorbital, orbital and peritonsillar cellulitis.	**if *Streptococcus pyogenes* is suspected based on clinical presentation** and phenoxymethylpenicillin is not available, alternative options include: **dicloxacillin** 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days OR **flucloxacillin** 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days if neither dicloxacillin nor flucloxacillin is available, alternative options (in order of preference) include: **cefalexin** 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 5 days OR **clindamycin** 450 mg (child: 10 mg/kg up to 450 mg) orally, 8-hourly for 5 days **if *Staphylococcus aureus* is suspected based on clinical presentation**: dicloxacillin and flucloxacillin are not in shortage at the time of writing
impetigo: localised sores (nonendemic settings)	**mupirocin** 2% ointment or cream topically to crusted areas, 8-hourly for 5 days	Use soap and water topically three times a day to soften crusts. For management of impetigo in endemic settings, see *Therapeutic Guidelines*.	mupirocin 2% ointment and cream are not in shortage at the time of writing
impetigo: multiple or recurrent sores (nonendemic settings)	**dicloxacillin** 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 7 days OR **flucloxacillin** 500 mg (child: 12.5 mg/kg up to 500 mg) orally, 6-hourly for 7 days	Stop therapy earlier if the infection has resolved. If treatment is unsuccessful, see *Therapeutic Guidelines*. Eradication of staphylococcal carriage may be indicated; see *Therapeutic Guidelines*. For management of impetigo in endemic settings, see *Therapeutic Guidelines*.	dicloxacillin and flucloxacillin are not in shortage at the time of writing

Indication	First-line treatment	Notes	Alternative if first-line treatment is not available For general guidance on managing antimicrobial shortages, see here.
acute mild diabetic foot infection	**dicloxacillin** 500 mg orally, 6-hourly OR **flucloxacillin** 500 mg orally, 6-hourly	Typically 1 to 2 weeks of therapy is sufficient. See *Therapeutic Guidelines* if the patient has systemic symptoms, chronic diabetic foot infection, has recently received antibiotics, or has risk factors for MRSA infection.	dicloxacillin and flucloxacillin are not in shortage at the time of writing
lactational mastitis	**dicloxacillin** 500 mg orally, 6-hourly. If symptoms and signs resolve rapidly, 5 days of therapy may be sufficient; otherwise continue treatment for 10 days OR **flucloxacillin** 500 mg orally, 6-hourly. If symptoms and signs resolve rapidly, 5 days of therapy may be sufficient; otherwise continue treatment for 10 days	For patients **without** systemic symptoms, increased breastfeeding and gentle expression of milk from the affected breast for 24 to 48 hours may resolve symptoms without antibiotic treatment. If this fails to resolve symptoms, and in all patients with systemic symptoms, antibiotic treatment is recommended to minimise the risk of abscess. Advise the patient to continue breastfeeding and gentle milk expression. Consider lactation support.	dicloxacillin and flucloxacillin are not in shortage at the time of writing

COPD = chronic obstructive pulmonary disease; MRSA = methicillin-resistant *Staphylococcus aureus*; NAAT = nucleic acid amplification testing; PCR = polymerase chain reaction

Summary guide to suitability of some antibiotic formulations for crushing or dispersing

Advice from Don't Rush to Crush for use during shortage of first-line antibiotics

These recommendations apply to doses that are equal to a whole tablet or capsule. ***Don't Rush to Crush*** provides part-dosing information for a limited number of antibiotics. Ask your community pharmacist for advice.

Dispersing is preferred to crushing wherever possible, because less of the dose is lost during preparation.

Antibiotics can be irritant and may cause sensitisation. *Don't Rush to Crush* recommends wearing a mask and gloves when crushing antibiotic tablets.

Easy-to-follow instructions for crushing and dispersing medicines are available from the SHPA website. **How to prepare your medicines if you have difficulty swallowing** is a patient information resource that is suitable to provide to carers. Following these instructions for preparation will help minimise any loss of the medicine on equipment and surfaces.

Medicine	Dose	Method	Notes
Amoxicillin capsule	250 mg or 500 mg		Open the capsule and mix the contents with a spoonful of yoghurt or apple puree.
Amoxicillin + clavulanate tablet	500 mg + 125 mg or 875 mg + 125 mg		Crush the tablet and mix with a spoonful of yoghurt or apple puree.
Azithromycin tablet	500 mg		Crush the tablet and mix with a spoonful of yoghurt or apple puree.
Cefalexin capsule	250 mg or 500 mg		Open the capsule and mix the contents with a spoonful of yoghurt or apple puree.
Cefuroxime tablet	250 mg		Disperse the tablet in 40–60 mL of orange juice, grape juice, apple juice or chocolate milk.
Ciprofloxacin tablet	250 mg or 500 mg*		Crush the tablet and mix with a spoonful of apple puree (do not mix with yoghurt or milk-based products).
Clarithromycin tablet	250 mg or 500 mg		Disperse the tablet in 10-20 mL of water. Or crush the tablet and mix with a spoonful of yoghurt or apple puree.
Clindamycin capsule	150 mg*		Open the capsule and mix the contents with 10 mL of fruit juice.
Dicloxacillin capsule	250 mg or 500 mg		Open the capsule and add the contents to 10-20 mL of water. The capsule contents may be mixed with a spoonful of yoghurt or apple puree, however absorption may be reduced.

Summary guide to suitability of some antibiotic formulations for crushing or dispersing

Medicine	Dose	Method	Notes
Doxycycline tablet	50 mg or 100 mg		Allow the tablet to soften in 20 mL of water for 5 minutes, then crush the tablet. Mix with milk, chocolate milk, chocolate pudding or apple juice to mask the taste. Follow the dose with a glass of water.
Flucloxacillin capsule	250 mg or 500 mg		Open the capsule and add the contents to 10-20 mL of water. The capsule contents may be mixed with a spoonful of yoghurt or apple puree, however absorption may be reduced.
Metronidazole tablet	200 mg or 400 mg		Disperse the tablet in 10-20 mL of water. Or crush the tablet and mix with a spoonful of yoghurt or apple puree.
Moxifloxacin tablet	400 mg*		Disperse the tablet in 10-20 mL of water. Give chocolate syrup or peanut butter before and after the dose to help mask the taste. Or crush the tablet and mix with a spoonful of yoghurt or apple puree.
Phenoxymethylpenicillin capsule	250 mg or 500 mg		Open the capsule and mix the contents with a spoonful of yoghurt or apple puree.
Phenoxymethylpenicillin tablet	250 mg or 500 mg		Crush the tablet and mix with a spoonful of yoghurt or apple puree.
Trimethoprim + sulfamethoxazole tablet	80 mg + 400 mg or 160 mg + 800 mg		Disperse the tablet in 10-20 mL of water. Or crush the tablet and mix with a spoonful of yoghurt or apple puree.

*more information about dosing is available in *Don't Rush to Crush*

More information about these medicines is available in *Don't Rush to Crush*, Australia's essential guide to safely administering oral medicines to people with enteral feeding tubes or swallowing difficulties.

The 4th edition (2021) includes information about the safety and suitability of:

- crushing and dispersing tablets
- opening capsules
- giving injections orally
- preparing doses that are less than a whole tablet or capsule (part-dosing)
- oral liquid medicines and aspiration risk for people with dysphagia
- medicines after bariatric surgery, or for people with altered gastrointestinal function.

Don't Rush to Crush is a required text for all pharmacies. Contact your community pharmacist for more information, or order your copy here.