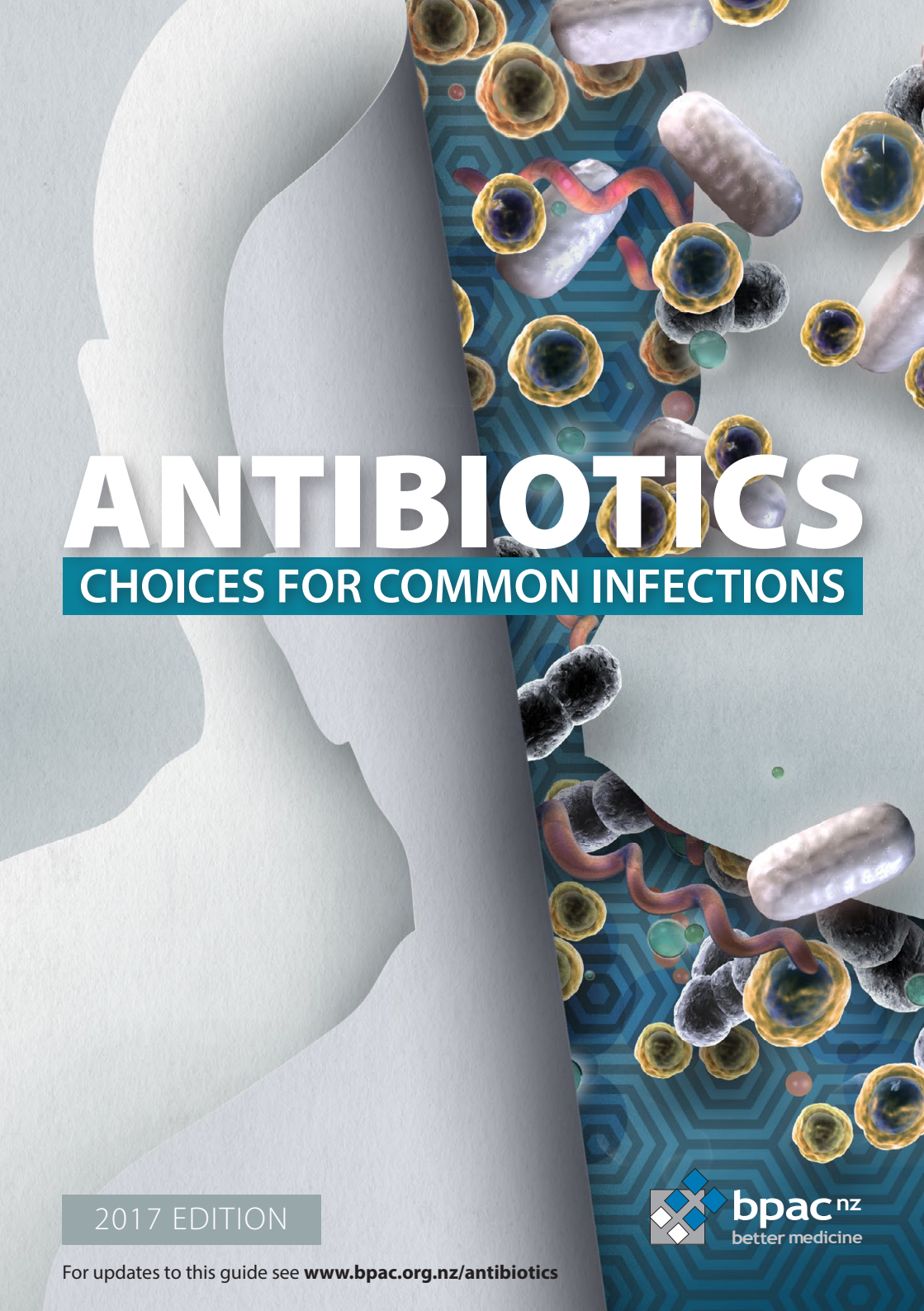

ANTIBIOTICS

CHOICES FOR COMMON INFECTIONS

2017 EDITION

For updates to this guide see **www.bpac.org.nz/antibiotics**

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Antibiotic choices for common infections

The following information is a consensus guide. It is intended to aid selection of an appropriate antibiotic for typical patients with infections commonly seen in general practice. Individual patient circumstances and local resistance patterns may alter treatment choices.

Antibiotic use in New Zealand is higher per head of population than in many similar developed countries. Increased antibiotic use leads to the development of resistance by eliminating antibiotic-susceptible bacteria and leaving antibiotic-resistant bacteria to multiply. Antimicrobial stewardship aims to limit the use of antibiotics to situations where they deliver the greatest clinical benefit. Along with infection control, this is the key strategy to counter the emerging threat of antimicrobial resistance.

General principles of antimicrobial stewardship:

1. In most cases, only prescribe antibiotics for bacterial infections if:
   - Symptoms are significant or severe
   - There is a high risk of complications
   - The infection is not resolving or is unlikely to resolve
2. Select the first-line indicated antibiotic at the recommended dose and duration
3. Reserve broad spectrum antibiotics for indicated conditions only
4. Prioritise consideration of antibiotic resistance over palatability issues and convenience of dosing regimens when deciding which antibiotic to prescribe
5. Educate patients about responsible use of antibiotics, including when an antibiotic is not indicated

Information on national antimicrobial resistance patterns is available from the Institute of Environmental Science and Research Ltd (ESR), Public Health Surveillance: **www.surv.esr.cri.nz**

Regional resistance patterns may vary; check with your local laboratory.

To check the subsidy status of a medicine, refer to the New Zealand Formulary: **www.nzformulary.org** or the Pharmaceutical Schedule: **www.pharmac.govt.nz/tools-resources/pharmaceutical-schedule**

For an electronic version of this guide see:
www.bpac.org.nz/antibiotics

The information in this guide is correct as at the time of publication: March, 2021.

Respiratory

COPD – acute exacerbations

Management	Antibiotic treatment is usually only necessary for patients with moderate to severe signs and symptoms of infection. Approximately half of COPD exacerbations are triggered by viruses rather than bacteria. Antibiotic treatment is more likely to be helpful in patients with clinical signs of chest infection (e.g. purulent sputum and increased shortness of breath and/or increased volume of sputum) and those with more severe airflow obstruction at baseline.
Common pathogens	Respiratory viruses, *Streptococcus pneumoniae, Haemophilus influenzae, Moraxella catarrhalis*
Antibiotic treatment	**Acute exacerbation of COPD with moderate to severe signs of infection**
First choice	**Amoxicillin** **Adult:** 500 mg, three times daily, for five days*
Alternatives	**Doxycycline** **Adult:** 200 mg, on day one (loading dose), followed by 100 mg, once daily, on days two to five*

* Longer courses may not provide additional clinical benefit

Pertussis (whooping cough)

Management	Antibiotic treatment is recommended to reduce transmission, if initiated within three weeks of the onset of the cough; after this time most people are no longer infectious. Antibiotic treatment is also recommended if the duration of the cough is unknown, and for pregnant women with pertussis. Prophylactic antibiotics are recommended for high risk contacts: children aged less than one year and their caregivers, pregnant women and people at risk of complications, e.g. severe asthma, immunocompromised. Antibiotic treatment is unlikely to alter the clinical course of the illness, unless given within the first few days of contracting the infection. However, as initial symptoms are often indistinguishable from a minor respiratory infection, antibiotics are not usually considered early on unless there is reason to suspect pertussis infection, e.g. family contacts.

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Management continued	Patients should be advised to avoid contact with others, especially infants and children, until at least five days of antibiotic treatment has been taken. Children with pertussis can deteriorate rapidly and may require hospitalisation. Pertussis is a Notifiable Disease. Suspected cases must be notified to the Medical Officer of Health. Check with the local Medical Officer of Health as to whether laboratory testing is appropriate.
Common pathogens	*Bordetella pertussis*
Antibiotic treatment	**Pertussis symptoms < 3 weeks or high risk contact**
First choice	**Azithromycin*** **Child < 45 kg:** 10 mg/kg/dose, once daily, on day one, followed by 5 mg/kg/dose, once daily, on days two to five **Adult** and **child > 45 kg:** 500 mg on day one, followed by 250 mg, once daily, on days two to five * Macrolide antibiotics are associated with a risk of development of hypertrophic pyloric stenosis in infants aged under two weeks. However, the benefits of treating pertussis outweigh this risk; azithromycin is the preferred macrolide during pregnancy, lactation and in infants aged < 1 month.
Alternatives	**Erythromycin*** **Child:** 10 mg/kg/dose, four times daily, for 14 days **Adult:** 400 mg, four times daily, for 14 days * See note above re. macrolides **Trimethoprim + sulfamethoxazole**† (for adults and children aged > 6 weeks allergic to macrolides) **Child:** 24mg/kg/dose, twice daily, for 14 days **Adult:** 960 mg (two tablets), twice daily, for 14 days † Formerly referred to as co-trimoxazole oral liquid 40+200 mg/5 mL or co-trimoxazole tablets 80+400 mg; now expressed as the total dose of trimethoprim + sulfamethoxazole (ratio 1:5) – 240 mg/5 mL oral liquid or 480 mg tablets. N.B. avoid in infants aged under six weeks, due to the risk of hyperbilirubinaemia.

Pneumonia – adult

Management	Antibiotic treatment is appropriate for all adults with suspected pneumonia. Adults with pneumonia may present with symptoms and signs specific to the chest, or less specific respiratory and systemic symptoms, e.g. confusion (particularly in elderly people). Consider referral to hospital for patients with one or more of the following features: co-morbidities, altered mental state, respiratory rate >30/min, pulse rate >125/min, O_2 saturation ≤92%, BP systolic <90 mm Hg or diastolic <60 mm Hg, age > 65 years, lack of reliable observation at home. Chest x-ray is not routinely recommended in a community setting. It may be appropriate when the diagnosis is unclear, there is dullness to percussion or other signs of an effusion or collapse, or when the likelihood of malignancy is increased, such as in a smoker aged over 50 years.
Common pathogens	*Streptococcus pneumoniae, Haemophilus influenzae, Mycoplasma pneumoniae, Chlamydophila pneumoniae, Legionella pneumophila, Staphylococcus aureus,* respiratory viruses N.B. Patients can generally be adequately treated with an antibiotic that covers *S. pneumoniae*.
Antibiotic treatment	**Suspected or confirmed pneumonia**
First choice	**Amoxicillin** **Adult:** 500 mg – 1 g, three times daily, for five to seven days If atypical organisms are suspected, e.g. *M. pneumoniae*, *C. pneumoniae* or *L. pneumophila*, or if the patient has not improved after 48 hours, **add either:** **Roxithromycin** 300 mg, once daily, for seven days; **or** **Doxycycline** 200 mg, twice daily, on day one, followed by 100 mg, twice daily, from days two to seven
Alternatives	Monotherapy with **roxithromycin** or **doxycycline** is acceptable for people with a history of penicillin allergy. N.B. Ciprofloxacin should not be used as it does not reliably treat infections due to *S. pneumoniae*.

Pneumonia – child

Management	Antibiotic treatment is appropriate for all children with suspected pneumonia. Children with pneumonia may present with a range of respiratory symptoms and signs; fever, tachycardia and increased respiratory effort are more common, auscultatory signs are less common. Consider referral to hospital for a child with any of the following features: age < 6 months, drinking less than half their normal amount, oxygen saturation ≤ 92% on air, increased respiratory effort, temperature < 35°C or > 40°C, decreased breath sounds or dullness to percussion, lack of reliable observation at home. In addition, if there is no response to treatment in 24 – 48 hours, review diagnosis and consider referral to hospital. Chest x-ray is not routinely recommended in a community setting. It may be appropriate when the diagnosis is unclear, there is dullness to percussion or other signs of an effusion or collapse or the history is suggestive of foreign body aspiration.
Common pathogens	*Streptococcus pneumoniae, Haemophilus influenzae, Mycoplasma pneumoniae, Staphylococcus aureus,* respiratory viruses
Antibiotic treatment	**Suspected or confirmed pneumonia**
First choice	**Amoxicillin** **Child:** 25 – 30 mg/kg/dose, three times daily, for five to seven days (maximum 500 mg/dose age three months to five years, 1000 mg/dose age > five years)
Alternatives	**Erythromycin** **Child:** 10 – 12.5 mg/kg/dose, four times daily, for seven days N.B. Can be first-line in school-aged children where the likelihood of atypical pathogens is higher. **Roxithromycin*** **Child < 40 kg:** 2.5 – 4 mg/kg/dose (maximum 150 mg), twice daily, for seven to ten days **Child > 40 kg:** 150 mg, twice daily, for seven to ten days * Roxithromycin is now also available in a 50 mg dispersable tablet for children < 12 years.

Ear, nose and throat

Otitis externa – acute

Management	Antibiotic treatment (topical) should only be considered if secondary infection is present. First-line management is gentle cleansing of the external ear canal, e.g. with suction, a wick or probe. If signs of infection persist after thorough cleansing, a solution containing an anti-infective and a corticosteroid may be considered. Underlying chronic otitis media should be excluded before treatment. Most topical antibacterials are contraindicated in the presence of a perforated drum or grommets; they may, however, be used with caution if cleansing of the ear canal alone has been unsuccessful in resolving symptoms. Patients with acute infection should be advised to avoid immersing their ears while swimming or to wear a protective cap. N.B. People with diabetes or who are immunocompromised are at risk of necrotizing or malignant otitis externa.
Common pathogens	*Staphylococcus aureus, Streptococcus pyogenes, Pseudomonas aeruginosa,* polymicrobial infections
Antibiotic treatment	**Otitis externa with secondary infection**
First choice	**Flumethasone + clioquinol** (Locorten Vioform) **Adult** and **child > 2 years:** 2 to 3 drops, twice daily, for seven days ***OR*** **Dexamethasone + framycetin + gramicidin** (Sofradex) **Adult** and **child:** 2 to 3 drops, three to four times daily, for seven days N.B. Avoid using drops for longer than one week as this may result in fungal infection which can be difficult to treat
Alternatives	**Acetic acid 2%** (Vosol) may be sufficient in mild cases. **Triamcinolone + neomycin + gramicidin + nystatin** (Kenacomb) if fungal infection is suspected **Ciprofloxacin + hydrocortisone** (Ciproxin HC) if *Pseudomonas* suspected. **Framycetin** (Soframycin) if a steroid is not required as part of the preparation.

Otitis media – acute

Management	Antibiotic treatment is usually unnecessary as most infections are self-limiting. Consider antibiotics for children at high risk, e.g. with systemic symptoms, aged < 6 months, aged < 2 years with severe or bilateral infection, with perforation and/or otorrhoea or if there has been no improvement within 48 hours. Also consider antibiotics in children with recurrent infections, i.e. three or more episodes of otitis media within six months or four or more within 12 months. Otherwise treat symptomatically, e.g. paracetamol, and arrange follow up or give a "back pocket" prescription to be dispensed if no improvement in next 24 – 48 hours. **Otitis media with effusion** – antibiotics provide little or no long-term benefit in children without acute symptoms; watchful waiting is recommended. Consider referral to otorhinolaryngology (ENT) if recurrent acute otitis media or persistent bilateral middle ear effusions for more than three months.
Common pathogens	Respiratory viruses, *Streptococcus pneumoniae, Haemophilus influenzae, Moraxella catarrhalis*
Antibiotic treatment	**Otitis media in child with risk factors or recurrent infection**
First choice	**Amoxicillin** **Child:** 15 mg/kg/dose, three times daily, for five days. N.B. Treat for **seven to ten days** if aged < 2 years, underlying medical condition, bilateral otitis media or perforated ear drum **For severe or recurrent infection** use 30 mg/kg/dose, three times daily, for five to seven days (maximum 500 mg/dose age three months to five years, 1000 mg/dose age > 5 years).
Alternatives	**Trimethoprim + sulfamethoxazole*** **Child > 6 weeks:** 24 mg/kg/dose, twice daily, for five to seven days * Formerly referred to as co-trimoxazole oral liquid 40+200 mg/5mL; now expressed as the total dose of trimethoprim + sulfamethoxazole (ratio 1:5) – 240 mg/5 mL oral liquid. N.B. avoid in infants aged under six weeks, due to the risk of hyperbilirubinaemia.

Sinusitis – acute

Management	Antibiotic treatment is not required in the majority of cases. More than 90% of patients with sinusitis will not have a bacterial infection. Even in the small minority that do, symptoms are self-limiting and antibiotics only offer a marginal benefit. Antibiotics may be considered for patients with symptoms that persist for more than ten days, onset of severe symptoms or fever (>39°C) and purulent nasal discharge or facial pain lasting for at least three consecutive days, or onset of worsening symptoms after initial improvement.
Common pathogens	Respiratory viruses, *Streptococcus pneumoniae, Haemophilus influenzae, Moraxella catarrhalis*, anaerobic bacteria
Antibiotic treatment	**Persistent or severe sinusitis**
First choice	**Amoxicillin** **Child:** 25 – 30mg/kg/dose, three times daily, for seven days (maximum 500 mg/dose age three months to five years, 1000 mg/dose age > 5 years) **Adult:** 500 – 1000 mg, three times daily for seven days
Alternatives	**Doxycycline** **Adult** and **child > 12 years:** 200 mg on day one, followed by 100 mg, once daily, on days two to seven **Amoxicillin clavulanate*** (if symptoms persist despite a treatment course of amoxicillin) **Child:** 15 – 30 mg/kg/dose, three times daily, for seven days (maximum 625 mg/dose) **Adult:** 625 mg, three times daily, for seven days * Expressed as a combination of amoxicillin and clavulanic acid 4:1 ratio

Sore throat – including pharyngitis and tonsillitis

Management	Antibiotic treatment of sore throat is recommended for patients at high risk of rheumatic fever with Group A streptococcus (GAS) infection. Antibiotic treatment is unnecessary in almost all other cases as sore throat (which includes pharyngitis and tonsillitis) is often viral in origin, and whether caused by a virus or by GAS is usually self-limiting. Antibiotics may be considered if the patient is at risk of complications. **People at high risk of rheumatic fever** are those who have: ■ A personal, family or household history of rheumatic fever ***OR*** ■ Two or more of the following criteria: – Māori or Pacific ethnicity – Aged 3–35 years – Living in crowded circumstances or in lower socioeconomic areas People at high risk of rheumatic fever should have a throat swab taken at the same time that empiric antibiotic treatment is initiated (if follow-up is possible). Patients who test negative for GAS can discontinue antibiotic use Antibiotic treatment of sore throat may be considered in patients if peritonsillar cellulitis or abscess (quinsy) develops, but it is usually appropriate to refer these patients to hospital. Patients who develop scarlet fever require antibiotic treatment. Refer to the **New Zealand Heart Foundation Algorithm** for the management of patients with sore throat for further guidance
Common pathogens	Respiratory viruses, Group A streptococcus (*Streptococcus pyogenes*) and other streptococcus species

Antibiotic treatment	
First choice	**Phenoxymethylpenicillin** (Penicillin V) **Child < 20 kg:** 250 mg, two or three times daily, for ten days **Child ≥ 20 kg** and **Adults:** 500 mg, two or three times daily, for ten days ***OR*** **Amoxicillin** **Child < 30 kg:** 750 mg or 50 mg/kg (maximum 1000 mg/day), once daily, for ten days ***OR*** 25 mg/kg/dose (maximum 1000 mg/day), twice daily, for ten days **Child ≥ 30 kg** and **Adults:** 1000 mg, once daily, for ten days ***OR*** 25 mg/kg/dose (maximum 1000 mg/day), twice daily, for ten days ***OR*** **IM benzathine penicillin (stat)** **Child < 30 kg:** 450 mg (600 000 U) **Child ≥ 30 kg** and **Adults:** 900 mg (1 200 000 U)
Alternatives	**Erythromycin** **Child:** 40 mg/kg/day divided in 2–3 doses for ten days (usual maximum 1.6 g/day) **Adult:** 400 mg, twice daily, for ten days **Roxithromycin*** **Child < 40 kg:** 2.5 mg/kg/dose, twice daily, for ten days **Child > 40 kg:** 150 mg, twice daily, for ten days **Adult:** 300 mg, once daily or 150 mg, twice daily, for ten days * Roxithromycin is now also available in a 50 mg dispersable tablet for children < 12 years.

Eyes

Conjunctivitis

Management	Antibiotic treatment is only required for patients with severe symptoms indicative of bacterial infection. Conjunctivitis can be viral, bacterial or allergic. Bacterial conjunctivitis is usually associated with purulent discharge. Symptoms are self-limiting and the majority of people improve without treatment, in two to five days. Conjunctivitis due to adenovirus and enterovirus is also self limiting. Patients with suspected HSV conjunctivitis require evaluation by an ophthalmologist. In newborn infants, consider *Chlamydia trachomatis* or *Neisseria gonorrhoeae*, in which case, do not use topical treatment. Collect appropriate eye swabs and refer to a paediatrician or ophthalmologist. Patients with conjunctivitis can be advised to clean away secretions from the eyelids and eyelashes using cotton wool soaked in water. Advise hand washing after touching the eyes and avoid sharing pillows, facecloths and towels. Do not wear contact lenses. Artificial tear drops can be used to relieve discomfort.
Common pathogens	Viruses including HSV, *Streptococcus pneumoniae, Haemophilus influenzae, Staphylococcus aureus*. Less commonly: *Chlamydia trachomatis* or *Neisseria gonorrhoeae*
Antibiotic treatment	**Severe bacterial conjunctivitis**
First choice	**Chloramphenicol 0.5% eye drops** **Adult** and **child > 2 years:** 1 – 2 drops, every 2 – 6 hours* until 48 hours after symptoms have cleared (or five days, whichever is shorter). **Chloramphenicol 1% eye ointment** may also be used at night in patients with severe infection or as an alternative to eye drops. * Frequency of administration can be reduced after two to three days
Alternatives	**Framycetin eye/ear drops** (Soframycin) **Adult** and **child:** 2 drops every 1 – 2 hours reducing to 2 – 3 drops, three times daily, until 48 hours after symptoms have cleared. **Fusidic acid eye gel 1%** **Adult** and **child:** 1 drop, twice daily until 48 hours after symptoms have cleared.

Periorbital cellulitis – see Cellulitus (Page 17)

Dental Infections

Dental abscess

Management	Antibiotic treatment is recommended for people with severe infection (e.g. with cellulitis), diffuse, tense swelling around the affected tooth or systemic symptoms. Acute dental pain can be managed with paracetamol, ibuprofen or a combination of the two. Codeine may be added if the pain is uncontrolled. To prevent aggravation of symptoms, patients can be advised to eat cool, soft foods, to chew on the unaffected side of the mouth and to avoid flossing near the abscess. Acute localised infections of the gums are generally treated by removing food particles and advising use of chlorhexidine mouthwash. Marked swelling can be managed by lancing and draining the abscess. Advise the patient to follow this with a warm, salty mouthwash, three times daily, for five days, to promote continued drainage as incisions will often heal causing the abscess to refill with pus. Antibiotics should be considered if the infection is severe. Antibiotics are rarely indicated for toothache without signs of abscess. Patients who have been treated in primary care for dental abscess should be referred for dental treatment as it is likely that the abscess will reoccur; tooth extraction or root canal may be required. The local DHB or PHO can provide information on available funding and services if there are barriers to private dental care.
Common pathogens	Polymicrobial with various anaerobes including viridans streptococci, the *Streptococcus anginosus* group, *Prevotella* and *Fusobacterium* species
Antibiotic treatment	**For severe infection** e.g. cellulitis, systemic symptoms or diffuse, tense and painful swelling
First choice	**Amoxicillin** **Adult:** 1 g stat, followed by 500 mg, three times daily, for three days* **Child:** 15–30 mg/kg (maximum 1 g), three times daily, for three days* * Assess after three days to determine if further antibiotic treatment is required. ***OR***

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First choice continued	*OR* **Metronidazole** **Child > 12 years** and **Adult:** 400 mg, three times daily for five days **Child < 12 years:** 7.5 mg/kg/dose (maximum 400 mg), three times daily for five days N.B. Amoxicillin and metronidazole can be prescribed in combination for patients with particularly severe infection.
Alternatives	**Erythromycin** **Adult:** 800 mg, twice daily, or 400 mg, four times daily, for five days **Child:** 20 mg/kg/dose, twice daily; or 10 mg/kg/dose, four times daily; for five days (maximum 1.6 g/day).

Prophylaxis of infective endocarditis prior to invasive dental procedures

Management

Antibiotic treatment is indicated for people at high risk of developing infective endocarditis who are undergoing dental procedures involving manipulation of either gingival tissue or tooth root region or perforation of the oral mucosa, or tonsillectomy/adenoidectomy.

People with any of the following are considered to be at high risk of developing infective endocarditis:

- A prosthetic heart valve, either biological or mechanical
- Rheumatic valvular heart disease
- Previous endocarditis
- Unrepaired cyanotic congenital heart disease or a repair procedure within the last six months
- Cardiac shunts or conduits for palliation

People at high-risk of endocarditis do NOT require prophylactic antibiotic if they are undergoing any of the following:

- Routine dental anaesthetic injections through non-infected tissue
- Dental x-rays
- Placement of removable prosthodontic or orthodontic appliances
- Adjustment of orthodontic appliances
- Placement of orthodontic brackets
- Losing deciduous teeth
- Treatment of bleeding caused by trauma to the lips or oral mucosa
- Pregnant women

	People at high risk of developing infective endocarditis who are undergoing general anaesthesia will generally be managed in a secondary care setting. Further information is available from: **www.bpac.org.nz/BPJ/2015/june/endocarditis.aspx**
Common pathogens	*Viridans streptococci*
Antibiotic treatment	**Prophylactic treatment**
First choice	**Amoxicillin** **Adult:** 2 g, stat, oral, intravenous or intramuscular **Child:** 50 mg/kg (maximum 2 g), stat*, oral, intravenous or intramuscular * Oral antibiotics should be taken one hour prior to the procedure; intramuscular injections should be given 30 minutes prior and intravenous injections can be given immediately before the procedure.
Alternatives	**Clarithromycin***(penicillin allergy or a penicillin or cephalosporin in the previous month) **Adult:** 500 mg, single oral dose **Child:** 15 mg/kg (maximum 500 mg) single oral dose * Unapproved indication. Clarithromycin can have serious interactions with other medicines. See the NZF interactions checker: **www.nzf.org.nz**

CNS

Meningitis and meningococcal septicaemia Updated Dec, 2018

Management	Antibiotic treatment should be given to all patients with suspected meningitis or meningococcal septicaemia, while awaiting transport to hospital (if this does not delay transfer). Immediately refer all people with suspected meningitis or meningococcal septicaemia to hospital. Record observations, including neurological assessment, at least every 15 minutes while awaiting transfer. The first stage of meningococcal disease is associated with non-specific influenza-like symptoms and signs. Specific signs and symptoms of bacterial meningitis include: photophobia, severe headache, neck stiffness and focal neurologic deficit. Meningococcal septicaemia may be indicated by features such as non-blanching rash, unusual or mottled skin colour and rapidly deteriorating condition. Most patients will not display specific signs within the first four to six hours of illness (up to eight hours for adolescents) and infants may not display typical signs at all. Meningococcal disease is notifiable on suspicion.
Common pathogens	*Neisseria meningitidis, Streptococcus pneumoniae.* Viral: enteroviruses, *Herpes simplex* virus, *Varicella zoster* virus and other viruses. Rare: *Listeria monocytogenes, Haemophilus influenzae* Infants: *Group B Streptococcus, L. monocytogenes, E.coli*
Antibiotic treatment	**Suspected meningitis or meningococcal septicaemia**
First choice	**Ceftriaxone** **Child:** 100 mg/kg (up to 2 g) IV (or IM) **Adult:** 2 g IV (or IM) N.B. patients allergic to penicillin who **do not** have a documented history of anaphylaxis to penicillin can be given ceftriaxone
Alternatives	**Benzylpenicillin** (penicillin G) **Child:** 50 mg/kg (up to 2 g) IV (or IM) **Adult:** 2.4 g IV (or IM) N.B. The treatment dose of benzylpenicillin is higher than previously recommended. Almost any parenterally administered antibiotic in an appropriate dose will inhibit the growth of meningococci, so if ceftriaxone or benzylpenicillin are not available, give any other cephalosporin or penicillin antibiotic.

Skin

Bites – human and animal

Management	Antibiotic treatment is recommended for all patients with infected bites or as prophylactic treatment, depending on the nature of the bite. Prophylactic antibiotic treatment is recommended for human, dog or cat bites, severe or deep bites, bites on the hand, foot, face, tendon or ligament, in immunocompromised people and people presenting with an untreated bite, more than eight hours later. Clean and debride the wound thoroughly and assess the need for tetanus immunisation. Refer to hospital if there is bone or joint involvement.
Common pathogens	Polymicrobial infection, *Pasteurella multocida*, *Capnocytophaga canimorsus* (cat and dog bites), *Eikenella corrodens* (fist injury), *Staphylococcus aureus*, streptococci and anaerobes
Antibiotic treatment	**Infected bite or prophylaxis if risk factors**
First choice	**Amoxicillin clavulanate*** **Child:** 15 – 30 mg/kg/dose (maximum 625 mg/dose), three times daily, for seven days **Adult:** 625 mg, three times daily, for seven days * Expressed as a combination of amoxicillin and clavulanic acid 4:1 ratio
Alternatives	**Child > 12 years** and **Adult:** **Metronidazole** 400 mg, three times daily, plus **doxycycline** 200 mg on day one, followed by 100 mg, once daily, on days two to seven. **Child < 12 years:** **Metronidazole** 7.5 mg/kg/dose (maximum 400 mg), three times daily plus **trimethoprim + sulphamethoxazole*** 24 mg/kg/dose, twice daily, for seven days (maximum 20 mL/dose). * Formerly referred to as co-trimoxazole oral liquid 40+200 mg/5 mL; now expressed as the total dose of trimethoprim + sulfamethoxazole (ratio 1:5) – 240 mg/5 mL oral liquid. N.B. avoid in infants aged under six weeks, due to the risk of hyperbilirubinaemia.

Boils (furuncles)

Management	Antibiotic treatment is not usually required. Most lesions should be treated with incision and drainage alone. A topical antiseptic may be useful. Antibiotics may be considered if there is fever, spreading cellulitis or co-morbidity, e.g. diabetes, or if the lesion is in a site associated with complications, e.g. the face.
Common pathogens	*Staphylococcus aureus* Consider MRSA if there is a lack of response to flucloxacillin, another penicillin or cephalosporin.
Antibiotic treatment	**Boils (with complications)**
First choice	**Flucloxacillin** **Child:** 12.5 – 25 mg/kg/dose, three to four times daily, for five days **Adult:** 500 mg, four times daily, for five days
Alternatives	**Erythromycin** (if allergy to flucloxacillin or MRSA present*) **Child aged < 12 years:** 20 mg/kg/dose, twice daily, or 10 mg/kg/dose, four times daily, for five days (maximum 1 g/day) **Adult:** 800 mg, twice daily, or 400 mg, four times daily, for five days **Trimethoprim + sulfamethoxazole**† (if allergy to flucloxacillin or MRSA present*) **Child > 6 weeks:** 24 mg/kg/dose, twice daily, for five to seven days (maximum 960 mg/dose) **Child >12 years** and **Adult:** 960 mg (two tablets), twice daily, for five to seven days **Cefalexin** (if flucloxacillin not tolerated) **Child:** 12.5 – 25 mg/kg/dose, twice daily, for five days **Adult:** 500 mg, four times daily, for five days * Based on MRSA susceptibilities † Formerly referred to as co-trimoxazole oral liquid 40+200 mg/5 mL or co-trimoxazole tablets 80 + 400 mg; now expressed as the total dose of trimethoprim + sulfamethoxazole (ratio 1:5) – 240 mg/5 mL oral liquid or 480 mg tablets. N.B. avoid in infants aged under six weeks, due to the risk of hyperbilirubinaemia.

Cellulitis

Management	Antibiotic treatment is required for all patients with cellulitis. Oral antibiotic treatment is appropriate for those with mild to moderate cellulitis; intravenous treatment is usually required for patients with severe cellulitis or those not responding to oral treatment. Keep affected area elevated (if applicable) for comfort and to relieve oedema. Assess response to treatment in two days. Discuss referral to hospital for consideration of IV antibiotics if cellulitis is extensive, not responding to oral antibiotics, systemic symptoms are present (e.g. fever, nausea, vomiting) and in young infants. **For periorbital or facial cellulitis**, in all but very mild cases refer to hospital for consideration of IV antibiotics.
Common pathogens	*Streptococcus pyogenes, Staphylococcus aureus,* Group C or Group G streptococci
Antibiotic treatment	**Mild to moderate cellulitis**
First choice	**Flucloxacillin** **Child:** 12.5 – 25 mg/kg/dose, four times daily, for five days **Adult:** 500 mg, four times daily, for five days
Alternatives	**Erythromycin** (if allergy to flucloxacillin or MRSA present*) **Child < 12 years:** 20 mg/kg/dose, twice daily, or 10 mg/kg/dose, four times daily, for five days (maximum 1 g/day) **Adult:** 800 mg, twice daily, or 400 mg, four times daily, for five days. **Trimethoprim + sulfamethoxazole**† (if allergy to flucloxacillin or MRSA present*) **Child > 6 weeks:** 24 mg/kg/dose, twice daily, for five to seven days (maximum 960 mg/dose) **Child >12 years** and **Adult:** 960 mg (two tablets), twice daily, for five to seven days **Cefalexin** (if flucloxacillin not tolerated) **Child:** 12.5 mg/kg/dose, four times daily, for five days (maximum 500 mg/dose) **Adult:** 500 mg, four times daily, for five days * Based on MRSA susceptibilities † Formerly referred to as co-trimoxazole oral liquid 40+200 mg/5 mL or co-trimoxazole tablets 80 + 400 mg; now expressed as the total dose of trimethoprim + sulfamethoxazole (ratio 1:5) – 240 mg/5 mL oral liquid or 480 mg tablets. N.B. avoid in infants aged under six weeks, due to the risk of hyperbilirubinaemia.

Diabetic foot infections

Management	Antibiotic treatment is required if there are signs of infection in the wound. It is recommended to take a wound swab for microbiological analysis. The threshold for suspecting infection and testing a wound should be lower in people with diabetes and other conditions where perfusion and immune response are diminished, as classical clinical signs of infection are not always present. Referral for further assessment should be considered if infection is suspected to involve the bones of the feet, if there is no sign of healing after four weeks of treatment, or if other complications develop. Antibiotic treatment is not recommended for prevention of diabetic foot infections.
Common pathogens	Early infection is usually due to *Staphylococcus aureus* and/or streptococci. Later infection may be polymicrobial with a mixture of Gram-positive cocci, Gram-negative bacilli and anaerobes.
Antibiotic treatment	**Infected foot wound in adult with diabetes**
First choice	**Amoxicillin clavulanate*** **Adult:** 625 mg, three times daily, for five to seven days * Expressed as a combination of amoxicillin and clavulanic acid 4:1 ratio
Alternatives	**Cefalexin** 500 mg, four times daily, ***plus*** **metronidazole** 400 mg, two to three times daily, for five to seven days ***OR*** (for patients with penicillin hypersensitivity) **Trimethoprim + sulfamethoxazole*** 960 mg (two tablets), twice daily, ***plus*** **clindamycin**† 300 mg, three times daily, for five to seven days * Formerly referred to as co-trimoxazole tablets 80 + 400 mg; now expressed as the total dose of trimethoprim + sulfamethoxazole (ratio 1:5) – 480 mg tablets. † Requires specialist endorsement for > 4 capsules

Impetigo

Management	Antibiotic treatment is not usually required initially; good skin hygiene is the first-line management. There is a limited role for topical antibiotic treatment; only for localised infection and second-line to topical antiseptics. Oral antibiotic treatment is recommended for more extensive, widespread infection, bullous impetigo or if systemic symptoms are present. Initial management involves the simple measures of "clean, cut (nails) and cover". Use moist soaks to gently remove crusts from lesions, keep affected areas covered and exclude the child from school or preschool until 24 hours after treatment has been initiated. Assess and treat other infected household members. Topical treatment is only appropriate for areas of localised impetigo (usually ≤ 3 lesions). Current expert opinion favours the use of antiseptic cream, such as hydrogen peroxide or povidone-iodine, as first choice topical treatment, due to high rates of fusidic acid resistance in *S. aureus* in New Zealand. Recurrent impetigo may be the result of chronic nasal carriage of *S. aureus* (patient or household contact), or re-infection from fomite colonisation, e.g. clothing, linen, and may require decolonization.
Common pathogens	*Streptococcus pyogenes, Staphylococcus aureus*
Antibiotic treatment	**Impetigo (non-antibiotic + antibiotic treatment)**
First choice	**Topical** (localised area of infection): **Hydrogen peroxide 1% cream** Apply 2 – 3 times daily, for five days ***OR*** **Povidone-iodine 10% ointment** Apply 2 – 3 times daily, for five days **Oral** (extensive/multiple lesions) – treat as per cellulitis: **Flucloxacillin** **Child:** 12.5 – 25 mg/kg/dose, four times daily, for five days (maximum 500 mg/dose) **Adult:** 500 mg, four times daily, for five days
Alternatives	**Topical** **Fusidic acid 2% cream or ointment** Apply twice daily, for five days N.B. Use topical Fusidic acid as second line treatment after topical antiseptics and only if the infection is localized. If topical treatment fails, use oral treatment as above.

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Alternatives continued	**Oral** **Trimethoprim + sulfamethoxazole*** (if complicated infection, MRSA present† or allergy to flucloxacillin) **Child > 6 weeks:** 24 mg/kg/dose, twice daily, for five days (maximum 20 mL/dose) **Child >12 years** and **Adult**: 960 mg (two tablets), twice daily, for five days **Erythromycin** (if allergy to flucloxacillin or MRSA present†) **Child aged < 12 years:** 20 mg/kg/dose, twice daily, or 10 mg/kg/dose, four times daily, for five days (maximum 1.6 g/day) **Adult:** 800 mg, twice daily, or 400 mg, four times daily, for five days **Cefalexin** (if flucloxacillin not tolerated) **Child:** 12 – 25 mg/kg/dose, twice daily, for five days **Adult:** 500 mg, four times daily or 1 g, twice daily, for five days * Formerly referred to as co-trimoxazole oral liquid 40+200 mg/5 mL or co-trimoxazole tablets 80+400 mg; now expressed as the total dose of trimethoprim + sulfamethoxazole (ratio 1:5) – 240 mg/5 mL oral liquid or 480 mg tablets. N.B. avoid in infants aged under six weeks, due to the risk of hyperbilirubinaemia. † Based on MRSA susceptibilities

Mastitis

Management	Antibiotic treatment is required for severe, worsening or persistent symptoms. Conservative management to alleviate symptoms (e.g. gentle massage, warm compress) and ongoing breast emptying may be all that is required for treatment. If there is no improvement within 12 – 24 hours or symptoms are severe or worsening, antibiotics should be started. Breast feeding (or expressing) from both breasts should be continued; this is an important component of treatment and poses no risk to the infant.
Common pathogens	*Staphylococcus aureus* in lactating women, *S. aureus* and anaerobes in non-lactating females, or in males
Antibiotic treatment	**Severe or non-resolving mastitis**
First choice	**Flucloxacillin** **Adult:** 500 mg, four times daily, for 5 – 7 days
Alternatives	**Erythromycin** **Adult:** 400 mg, four times daily, for 5 – 7 days **Cephalexin** **Adult:** 500 mg, four times daily, for 5 – 7 days N.B. Treat mastitis in males or non-lactating females with **amoxicillin clavulanate*** 625 mg, three times daily, for seven days * Expressed as a combination of amoxicillin and clavulanic acid 4:1 ratio

Gastrointestinal

Campylobacter enterocolitis

Management	Antibiotic treatment is recommended for people with symptoms that are severe (e.g. high fever, bloody diarrhoea) or prolonged (> 7 days). Antibiotics may also be considered for people at high risk of complications or those who are at higher risk of transmitting infection to vulnerable people (although this is rare). This includes pregnant women, people who are immunocompromised and their carers, food handlers and childcare workers. Most people will recover with symptomatic treatment only, including rehydration. Antibiotics reduce the average duration of symptoms by less than two days but eradicate stool carriage. People can remain infectious to others for up to several weeks after onset of symptoms. However, with or without antibiotic treatment, spread from person to person is very rare. Campylobacter enterocolitis is a notifiable disease.
Common pathogens	*Campylobacter jejuni*
Antibiotic treatment	**Severe or prolonged campylobacter enterocolitis or high risk**
First choice	**Erythromycin** **Child:** 10 mg/kg/dose, four times daily, for five days **Adult:** 400 mg, four times daily, for five days
Alternatives	**Ciprofloxacin** **Adult:** 500 mg, twice daily, for five days (not recommended for children)

Clostridium difficile colitis

Management	Antibiotic treatment is recommended for adults who have tested positive for *C. difficile* toxin, and have diarrhoea or other symptoms consistent with colitis. *C. difficile* colitis occurs due to overgrowth of toxin-producing *C. difficile* in the colon. A common cause is the use of broad spectrum antibiotic treatment. Discontinuing such antibiotic treatment, if and when possible, may lead to clinical resolution of symptoms. Antidiarrhoeals, e.g. loperamide, should be avoided as the toxin may be retained and worsen colitis. Consider referral to hospital if there is evidence of worsening colitis. Relapse may occur after treatment.
	In children, detection of *C. difficile* commonly represents colonisation rather than pathological infection, so testing is discouraged, and antibiotic treatment is not generally required in the community setting.
Common pathogens	*Clostridium difficile*
Antibiotic treatment	**Confirmed *C. difficile* (adults)**
First choice	**Metronidazole** **Adult:** 400 mg, three times daily, for 10 days
Alternatives	**Vancomycin** If patient has not responded to two courses of metronidazole; discuss with an infectious diseases physician or clinical microbiologist. Oral vancomycin (using the injection product) may be required.

Diverticulitis

Management	Antibiotic treatment is not usually required for patients with uncomplicated diverticulitis, but may be considered if symptoms persist. Antibiotic treatment is not necessary for patients with mild symptoms who are able to take oral liquids, who do not have marked peritonitis and have sufficient support at home. Advise patients to follow a clear liquid diet for two to three days and reassess. Paracetamol can be prescribed for analgesia; non-steroidal anti-inflammatory drugs (NSAIDs) or opioids are not recommended as they may increase the risk of complications and recurrence. Consider initiating antibiotic treatment at a follow-up assessment for patients with worsening or persistent symptoms. Patients with suspected complicated diverticulitis, e.g. signs of sepsis or peritonitis, hypotension, tachycardia, severe symptoms, should be referred to secondary care for imaging and to determine the appropriate course of management. Referral to, or discussion with, a clinician in secondary care is appropriate for patients who are immunocompromised, pregnant, vomiting or unable to tolerate oral liquids, or have significant co-morbidities.
Common pathogens	*Bacteroides fragilis, Escherichia coli, Clostridium* and *Fusobacterium species;* however, it is thought that uncomplicated diverticulitis may have a primarily inflammatory, rather than infectious, basis.
Antibiotic treatment	**Persistent uncomplicated diverticulitis**
First choice	**Trimethoprim** + **sulfamethoxazole** 960 mg,* twice daily, for five days; **AND** **Metronidazole**, 400 mg, three times daily, for five days * Formerly referred to as co-trimoxazole tablets 80 + 400 mg; now expressed as the total dose of trimethoprim + sulfamethoxazole (ratio 1:5) – 480 mg tablets
Alternatives	**Amoxicillin clavulanate** 625 mg,† three times daily, for five days † Expressed as a combination of amoxicillin and clavulanic acid 4:1 ratio

Giardiasis

Management	Antibiotic treatment is recommended for people who have tested positive for giardia, and for symptomatic contacts. Secondary lactose intolerance often occurs after giardiasis; patients with ongoing symptoms after treatment can consider temporarily avoiding lactose-containing foods (e.g. for one month). People can remain infectious to others for up to several months after onset of symptoms. Giardiasis is a notifiable disease.
Common pathogens	*Giardia lamblia*
Antibiotic treatment	**Confirmed giardiasis or symptomatic contact**
First choice	**Ornidazole** **Child < 35 kg:** 125 mg/**3 kg**/dose,* once daily, for one to two days **Adult** and **child > 35 kg:** 1.5 g, once daily, for one to two days * N.B. Dose is per **3 kg** bodyweight; ornidazole is only available in tablet form, tablets may be crushed, child dosing equates to one quarter of a tablet per 3 kg. ***OR*** **Metronidazole** **Child:** 30 mg/kg/dose, once daily, for three days (maximum 2 g/dose) **Adult:** 2 g, once daily, for three days
Alternatives	For treatment failure with ornidazole: Exclude re-infection from asymptomatic family contacts, e.g. children **Metronidazole** **Child:** 10 mg/kg/dose, three times daily, for seven days, (maximum 400 mg/dose) **Adult:** 400 mg, three times daily, for seven days N.B. **Nitazoxanide** (hospital treatment) may be considered for recurrent treatment failures.

Salmonella enterocolitis

Management	Antibiotic treatment is usually unnecessary and may prolong excretion. Antibiotic treatment is, however, recommended for adults with severe disease, those who are immunocompromised and those with prosthetic vascular grafts. Discuss appropriate treatment for infants with a paediatrician; those aged < 3 months will require investigation and antibiotic management; those aged > 3 – 12 months may not, depending on clinical state. People typically remain infectious to others for several days to weeks after onset of symptoms; children may remain infectious for up to one year. However, with or without antibiotic treatment, spread to others is very rare.
Common pathogens	*Salmonella enteritidis, Salmonella typhimurium*
Antibiotic treatment	**Severe salmonella enterocolitis or risk factors**
First choice	**Ciprofloxacin** **Adult:** 500 mg, twice daily, for three days
Alternatives	**Trimethoprim + sulfamethoxazole*** **Adult:** 960 mg (two tablets), twice daily, for three days * Formerly referred to as co-trimoxazole tablets 80 + 400 mg; now expressed as the total dose of trimethoprim + sulfamethoxazole (ratio 1:5) – 480 mg tablets.

Genito-urinary

Bacterial vaginosis

Management	Antibiotic treatment is recommended for women who are symptomatic, pregnant or if an invasive procedure is planned, e.g. insertion of an IUD or termination of pregnancy. Approximately half of women found to have bacterial vaginosis are asymptomatic; antibiotic treatment is not necessary in these cases if there are no other risk factors. Treatment of male sexual contacts is not usually necessary.
Common pathogens	*Gardnerella vaginalis, Bacteroides, Peptostreptococci, Mobilunculus* and others
Antibiotic treatment	**Symptomatic bacterial vaginosis or risk factors**
First choice	**Metronidazole** **Adult:** 400 mg, twice daily, for seven days, or 2 g, stat, if adherence to treatment is a concern, however, this is associated with a higher relapse rate
Alternatives	**Ornidazole** 500 mg, twice daily, for five days or 1.5 g, stat Ornidazole is not recommended in women who are pregnant as no study data is available.

Chlamydia

Management	Antibiotic treatment is indicated for patients with confirmed chlamydia and their sexual contacts within the last three months or if there is a high suspicion of chlamydia (symptoms and/or signs). In suspected cases, empiric treatment should be commenced while awaiting laboratory results. Advise avoidance of unprotected sexual intercourse for seven days after treatment has been initiated, and for at least seven days after any sexual contacts have been treated, to avoid re-infection. A test of cure should be done five weeks after initiation of treatment in pregnant women, if a non-standard treatment has been used, e.g. amoxicillin, if symptoms do not resolve or if the patient had extragenital symptoms (e.g. rectal or oral). Repeat STI screen in three months.
Common pathogens	*Chlamydia trachomatis*
Antibiotic treatment	**Confirmed or suspected chlamydia**
First choice	**Azithromycin** **Adult:** 1 g, stat (if asymptomatic urogenital infection) ***OR*** **Doxycycline** (if symptomatic urethritis, rectal or oral infection or alternative required) **Adult:** 100 mg, twice daily, for seven days.* Do not use in women who are pregnant or breastfeeding. * Longer treatment may be required for patients with anorectal symptoms (up to 21 days); discuss with a sexual health physician
Alternatives	**Amoxicillin** (alternative for pregnant women if azithromycin contraindicated) 500 mg, three times daily, for seven days

Epididymo-orchitis

Management	Antibiotic treatment is required for all patients with suspected epididymo-orchitis and their sexual contacts within the last three months. Epididymo-orchitis may occur due to a variety of pathogens; STI pathogens are more likely in males aged < 35 years, with a history of more than one sexual partner in the past 12 months, and urethral discharge. Urinary or enteric pathogens account for other cases. Test for chlamydia, gonorrhoea and urinary tract infection; empirical treatment should be given while awaiting results. If symptoms are initially severe or signs and symptoms do not resolve (or worsen) after 24 to 48 hours, refer to hospital. Advise avoidance of unprotected sexual intercourse for two weeks after treatment has been initiated, and for at least seven days after any sexual contacts have been treated, to avoid re-infection.
Common pathogens	Majority due to *Chlamydia trachomatis* or *Neisseria gonorrhoeae*. Also *E. coli, Bacteroides* species, *Gardnerella vaginalis, Mycoplasma hominis, Ureaplasma urealyticum, Trichomonas vaginalis, Streptococcus agalactiae* and others
Antibiotic treatment	**Suspected epididymo-orchitis**
First choice	If STI pathogens suspected: **Ceftriaxone** **Adult:** 500 mg IM, stat (make up with 2 mL of lignocaine 1% or according to data sheet) ***AND*** **Doxycycline** **Adult:** 100 mg, twice daily, for 14 days If UTI pathogens suspected: **Ciprofloxacin** **Adult:** 500 mg, twice daily, for 10 days
Alternatives	**Amoxicillin clavulanate*** 625 mg, three times daily, for 10 days (if UTI pathogens suspected and contraindications to quinolones) *Expressed as a combination of amoxicillin and clavulanic acid 4:1 ratio

Gonorrhoea

Management	Antibiotic treatment is indicated for people with confirmed gonorrhoea and their sexual contacts within the last three months or if there is a high suspicion of gonorrhoea (symptoms and/or signs). In suspected cases, empiric treatment should be commenced while awaiting laboratory results. Advise avoidance of unprotected sexual intercourse for seven days after treatment has been initiated, and for at least seven days after any sexual contacts have been treated, to avoid re-infection. A test of cure should be done five weeks after initiation of treatment in pregnant women, or if a non-standard treatment has been used or if symptoms do not resolve. Repeat STI screen in three months. As co-infection with chlamydia is very common, azithromycin is also routinely given.
Common pathogens	*Neisseria gonorrhoeae*
Antibiotic treatment	**Confirmed or suspected gonorrhoea**
First choice	**Ceftriaxone** **Adult:** 500 mg IM, stat (make up with 2 mL of 1% lignocaine or according to data sheet) ***AND*** **Azithromycin** **Adult:** 1 g, stat (including in women who are pregnant or breastfeeding)
Alternatives	If isolate is ciprofloxacin susceptible and an alternative is required: **Ciprofloxacin** 500 mg, stat **+ azithromycin** 1 g, stat

Pelvic inflammatory disease

Management	Antibiotic treatment is required for females who are symptomatic. Pelvic inflammatory disease (PID) is usually caused by a STI, particularly in women aged < 25 years, those who have had recent change of sexual partner or those with a previous history of gonorrhoea or chlamydia. Empiric treatment should be started immediately on the basis of symptoms. Treatment should cover infection with gonorrhoea, chlamydia and anaerobes. Women with severe symptoms (e.g. fever, vomiting, acute abdominal pain) and pregnant women require referral for specialist assessment. Hospital admission may be required for IV antibiotics. Advise abstinence from sexual intercourse until abdominal pain has settled and avoidance of unprotected sexual intercourse for 14 days after treatment has been initiated, and for at least seven days after any sexual contacts have been treated, to avoid re-infection.
Common pathogens	*Chlamydia trachomatis, Neisseria gonorrhoeae* and others
Antibiotic treatment	**Symptomatic pelvic inflammatory disease**
First choice	**Ceftriaxone** **Adult:** 500 mg IM, stat (make up with 2 mL of 1% lignocaine or according to data sheet) ***AND*** **Doxycycline** **Adult:** 100 mg, twice daily, for 14 days ***AND*** **Metronidazole** **Adult:** 400 mg, twice daily, for 14 days (metronidazole may be discontinued if not tolerated)
Alternatives	**Ceftriaxone** 500 mg IM, stat **+ azithromycin** 1 g on day one and day eight is an alternative if compliance is likely to be poor. **Ornidazole** may be considered as an alternative, if metronidazole is not tolerated.

Trichomoniasis

Management	Antibiotic treatment is indicated for people with confirmed trichomoniasis and their sexual partners or if there is a high suspicion of trichomoniasis (symptoms and/or signs). Empiric treatment may be commenced while awaiting laboratory results. Due to low sensitivity, culture of urethral swabs is rarely positive in males, even if infection is present. Advise avoidance of unprotected sexual intercourse for seven days after treatment has been initiated, and for at least seven days after any sexual contacts have been treated, to avoid re-infection. A test of cure is not usually required unless there is a risk of re-exposure.
Common pathogens	*Trichomonas vaginalis*
Antibiotic treatment	**Confirmed or suspected trichomoniasis**
First choice	**Metronidazole** **Adult:** 2 g, stat
Alternatives	**Metronidazole** 400 mg, twice daily, for seven days may be used for those intolerant of the stat dose. **Ornidazole** 1.5 g, stat or 500 mg, twice daily, for five days may be used instead of metronidazole, but is not recommended in women who are pregnant as no study data is available.

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Urethritis – acute non-specific, male

Management	Antibiotic treatment is required for males who are symptomatic and their sexual contacts within the last three months. Non-specific urethritis is a diagnosis of exclusion. A urethral swab and first void urine sample should be taken to exclude gonorrhoea and chlamydia (or use combination testing if available). Advise avoidance of unprotected sexual intercourse for seven days after treatment has been initiated, and for at least seven days after any sexual contacts have been treated, to avoid re-infection. Patients with symptoms persisting for more than two weeks, or with recurrence of symptoms, should be referred to a sexual health clinic or urologist.
Common pathogens	Urethritis not attributable to *Neisseria gonorrhoeae* or *Chlamydia trachomatis* is termed non-specific urethritis and there may be a number of organisms responsible, e.g. *Ureaplasma urealyticum, Mycoplasma genitalium, Trichomonas vaginalis*
Antibiotic treatment	**Symptomatic acute non-specific urethritis**
First choice	**Doxycycline** **Adult:** 100 mg, twice daily, for seven days If purulent discharge, treat as for gonorrhoea, i.e. **ceftriaxone** 500 mg IM, stat **+ azithromycin** 1g, stat
Alternative	If adherence is a concern or an alternative is required: **Azithromycin** **Adult:** 1 g, stat

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Urinary Tract Infection – Cystitis: adult Updated Mar, 2019

Management	Antibiotic treatment is indicated for adults with symptoms and signs of cystitis (lower urinary tract infection). Urine culture is not necessary to diagnose cystitis. Urine culture is most useful for confirming the presence of significant bacteriuria and reporting on bacterial susceptibility to antibiotics in infections that are considered to be complicated due to an abnormality of the urinary tract or an underlying condition or clinical circumstance; this includes: ■ Males ■ Pregnant women ■ People with diabetes or renal failure ■ People with a urinary catheter ■ People living in residential care facilities ■ People with persistent or recurrent cystitis (three or more infections in one year) or atypical symptoms N.B. Urine culture is not recommended in asymptomatic people. However, if bacteriuria is incidentally found to be present, this only requires antibiotic treatment in pregnant women. Also see pyelonephritis
Common pathogens	*Escherichia coli, Staphylococcus saprophyticus, Proteus spp., Klebsiella spp., Enterococcus spp.*
Antibiotic treatment	**Symptomatic cystitis (adult)**
First choice	**Nitrofurantoin** **Adult:** 50 mg (immediate release, Nifuran), four times daily, or 100 mg (modified release, Macrobid), twice daily, for five days (avoid at 36+ weeks in pregnancy, and in patients with creatinine clearance < 60 mL/min). N.B. Treat for **seven days** in pregnant women and in males
Alternatives	**Trimethoprim** **Adult:** 300 mg, once daily, for three days (avoid during the first trimester of pregnancy) N.B. Treat for **seven days** in pregnant women and in males **Cefalexin** – only if infecting organism known to be susceptible, and resistant to the other choices **Adult:** 500 mg, twice daily, for three days N.B. Treat for **seven days** in pregnant women and in males N.B. If susceptibility testing indicates resistance to commonly available antibiotics, discuss treatment with a clinical microbiologist or infectious diseases specialist; alternative antimicrobials may be available in some DHBs

Urinary tract infection – Cystitis: child

Management	Antibiotic treatment (oral) is indicated for children aged over six months, without known renal tract abnormalities, and who do not have acute pyelonephritis. Refer children aged under six months, those with severe illness, or those with recurrent infection, to hospital for treatment. All children with suspected urinary tract infection should have a urine sample for culture collected (clean catch, catheter, midstream urine) as it may be a marker for previously undetected renal malformations, particularly in younger children. In older children it can be a marker for bladder and/or bowel dysfunction. For information on collecting a urine specimen in children, see: "Managing urinary tract infections in children", BPJ 44 (May, 2012).
Common pathogens	*Escherichia coli*, *Proteus spp.*, *Klebsiella spp.*, *Enterococcus spp.*
Antibiotic treatment	**Mild cystitis (child)**
First choice	**Trimethoprim + sulfamethoxazole*** **Child:** 24 mg/kg/dose, twice daily, for three days (maximum 960 mg/dose) * Formerly referred to as co-trimoxazole oral liquid 40+200 mg/5 mL; now expressed as the total dose of trimethoprim + sulfamethoxazole (ratio 1:5) – 240 mg/5 mL oral liquid. N.B. avoid in infants aged under six weeks, due to the risk of hyperbilirubinaemia.
Alternatives	**Cefalexin** **Child > 1 month:** 12.5 – 25 mg/kg/dose, twice daily, for three days (maximum 1 g/dose) **Amoxicillin clavulanate*** **Child:** 15 mg/kg/dose, three times daily, for three days (maximum 625 mg/dose) * Expressed as a combination of amoxicillin and clavulanic acid 4:1 ratio

Urinary Tract Infection – Pyelonephritis Updated Mar, 2019

Management	Antibiotic treatment (oral) is required for all patients with mild symptoms of pyelonephritis (upper urinary tract infection); patients with more severe symptoms (e.g. vomiting, dehydration, high fever), and all infants and children, require referral to hospital for treatment. Urine culture is recommended for all patients with suspected pyelonephritis. Renal tract ultrasound may also be appropriate depending on the clinical situation.
Common pathogens	*Escherichia coli*, *Proteus spp.*, *Klebsiella spp.*, *Enterococcus spp.*
Antibiotic treatment	**Mild pyelonephritis (adult)**
First choice	**Trimethoprim + sulfamethoxazole*** **Adult:** 960 mg (two tablets), twice daily, for ten days * Formerly referred to as co-trimoxazole tablets 80 + 400 mg; now expressed as the total dose of trimethoprim + sulfamethoxazole (ratio 1:5) – 480 mg tablets.
Alternatives	**Amoxicillin clavulanate*** **Adult:** 625 mg, three times daily, for ten days * Expressed as a combination of amoxicillin and clavulanic acid 4:1 ratio **Cefalexin** – only if infecting organism known to be susceptible, and resistant to the other choices **Adult:** 500 mg, twice daily, for ten days N.B. In most cases, patients with severe infection would be referred to hospital for treatment. If treatment is required in the community, give one dose of **IV gentamicin*** (refer to local protocols or NZF for dosing information), followed by standard oral treatment. * Can be ordered on PSO but is not subsidised

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The following references were used in the development of this guide:

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Respiratory

COPD – acute exacerbations
Pertussis (Whooping cough)
Pneumonia – adult
Pneumonia – child

Ear, nose and throat

Otitis externa – acute
Otitis media
Sinusitis – acute
Sore throat – including pharyngitis and tonsillitis

Eyes

Conjunctivitis

Dental

Dental abscess
Prophylaxis of infective endocarditis prior to invasive dental procedures

CNS

Meningitis and meningococcal septicaemia

Skin

Bites – human and animal
Boils
Cellulitis
Diabetic foot infections
Impetigo
Mastitis

Gastrointestinal

Campylobacter enterocolitis
Clostridium difficile colitis
Diverticulitis
Giardiasis
Salmonella enterocolitis

Genito-urinary

Bacterial vaginosis
Chlamydia
Epididymo-orchitis
Gonorrhoea
Pelvic inflammatory disease
Trichomoniasis
Urethritis – acute non-specific
Urinary tract infection – adult
Urinary tract infection – child
Urinary tract infection – pyelonephritis

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