ANTIBIOTICS

CHOICES FOR COMMON INFECTIONS

PLEASE NOTE

This edition of the guide is now out of date and should no longer be used.

For the updated version of this guide see:
www.bpac.org.nz/antibiotics

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2013 EDITION

Antibiotic choices for common infections

Increasing antimicrobial resistance is now a worldwide problem, compounded by the lack of development of new antimicrobial medicines. This leaves the prudent use of antimicrobial medicines, along with infection control, as the major strategies to counter this emerging threat.

A safe and effective strategy for antibiotic use involves prescribing an antibiotic only when it is needed and selecting an appropriate and effective medicine at the recommended dose, with the narrowest spectrum of antimicrobial activity, fewest adverse effects and lowest cost.

General principles of antibiotic prescribing:

1. 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. Use first-line antibiotics first
3. Reserve broad spectrum antibiotics for indicated conditions only

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.

Subsidy information for medicines has not been included in the guide as this is subject to change. Fully-subsidised medicines should be prescribed as first-line choices, where possible. To check the subsidy status of a medicine see the New Zealand Formulary at: **www.nzformulary.org or** the Pharmaceutical Schedule online at: **www.pharmac.health.nz**

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

Regional resistance patterns may vary slightly, check with your local laboratory.

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. Reviewed July, 2013. Updated October, 2016.

Respiratory

COPD – acute exacerbations

Management	Many exacerbations are triggered by viruses and antibiotic treatment provides limited benefit. Antibiotic treatment is most helpful in patients with severe exacerbations (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**
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

Pertussis (Whooping cough)

Management	Antibiotic treatment is recommended to reduce transmission, if initiated within three weeks of the onset of the cough, as after this time most people are no longer infectious. Antibiotic treatment is unlikely to alter the clinical course of the illness unless given early (in the catarrhal stage). If the duration of the cough is unknown, give antibiotic treatment. Women who are in their third trimester of pregnancy should also receive antibiotic treatment, regardless of the duration of cough. The patient should be advised to avoid contact with others, especially infants and children, until at least five days of antibiotic treatment has been taken. Prophylactic antibiotics are recommended for high risk contacts: children aged less than one year, people caring for children aged less than one year, pregnant women, and people at risk of complications, e.g. severe asthma, immunocompromised.
Common pathogens	*Bordetella pertussis*

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Respiratory (continued)

Antibiotic treatment	**Pertussis (Whooping cough)**
First choice	**Azithromycin** (first-line for children, alternative for adults) **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 **Erythromycin** (first-line for adults, alternative for children aged over one year) **Child:** 10 mg/kg/dose, four times daily, for 14 days **Adult:** 400 mg, four times daily, for 14 days N.B. Erythromycin ethyl succinate is currently the only fully subsidised form of oral erythromycin available in New Zealand. Treatment and prophylaxis is recommended for 14 days with erythromycin ethyl succinate. There is evidence that seven days of treatment with erythromycin estolate (which has superior tissue and serum concentrations compared with the other erythromycin salts), is as effective as 14 days treatment. However, erythromycin estolate is not currently available in New Zealand.
Alternatives	None

Pneumonia – adult

Management	Chest x-ray is not routinely recommended, however, it may be appropriate when the diagnosis is unclear, there is dullness to percussion or other signs of an effusion or collapse, and when the likelihood of malignancy is increased, such as in a smoker aged over 50 years. Patients with one or more of the following features: age > 65 years, confusion, respiratory rate >30/min, systolic BP < 90 mm Hg, diastolic BP <60 mm Hg, have a predicted increased mortality rate and admission to hospital should be considered. Patients can generally be adequately treated with an agent that covers *S. pneumoniae*. Ciprofloxacin should not be used as it does not reliably treat infections due to *S. pneumoniae*.
Common pathogens	Respiratory viruses, *Streptococcus pneumoniae, Haemophilus influenzae, Mycoplasma pneumoniae, Chlamydophilia pneumonia*, *Legionella pneumophila*, *Staphylococcus aureus*

Antibiotic treatment	**Pneumonia – adult**
First choice	**Amoxicillin** **Adult:** 500 mg – 1 g, three times daily, for five to seven days If *M. pneumoniae*, *C. pneumoniae* or *L. pneumophila* are suspected 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 * Increased dose as recommended by ADHB pneumonia guidelines
Alternatives	Monotherapy with **roxithromycin** or **doxycycline** is acceptable for people with a history of penicillin allergy.

Pneumonia – child

Management	Referral to hospital should be considered for any child with one or more of the following factors: aged less than six months, drinking less than half their normal amount, oxygen saturation ≤92% on pulse oximetry, severe tachypnoea, decreased respiratory effort, temperature < 35°C or > 40°C, decreased breath sounds or dullness to percussion, difficult to rouse. In addition, if there is no response to treatment in 24 – 48 hours, review diagnosis and consider referral to hospital.
Common pathogens	Respiratory viruses, *Streptococcus pneumoniae, Haemophilus influenzae, Mycoplasma pneumoniae, Staphylococcus aureus*

Antibiotic treatment	**Pneumonia – child**
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:** 4 mg/kg/dose, twice daily, for seven to ten days N.B. Only available in tablet form, therefore only if the child can swallow tablets; whole or half tablets may be crushed.

Ear, nose and throat

Otitis externa – acute

Management	Gentle debridement of the ear canal may be necessary to enhance the effectiveness of topical treatment. Suction cleaning is also a safe and effective method of debridement. Most topical antibacterials are contraindicated in the presence of a perforated drum or grommets, however, they may need to be used if other treatment options have been unsuccessful.
Common pathogens	*Staphylococcus aureus, Streptococcus pyogenes, Pseudomonas aeruginosa,* polymicrobial infections
Antibiotic treatment	**Otitis externa (acute)**
First choice	**Clioquinol + flumethasone** (Locorten Vioform)* **Adult** and **child > 2 years:** 2 to 3 drops, twice daily, for 7 days *OR* **Dexamethasone + framycetin + gramicidin** (Sofradex)* **Adult** and **child:** 2 to 3 drops, three to four times daily, for 7 days Avoid excessive use, e.g. 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. **Ciprofloxacin + hydrocortisone** (Ciproxin HC)* if *Pseudomonas* suspected. **Flucloxacillin** if there is spreading cellulitis or the patient is systemically unwell; also consider referral to hospital.

* Currently subsidised brand

Otitis media

Management	**Antibiotic treatment is usually unnecessary.** Consider antibiotics for children at high risk such as those with systemic symptoms, aged less than six months, aged less than two years with severe or bilateral disease, or with perforation and/or otorrhoea. Also consider antibiotics in children who have had more than three episodes of otitis media. 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.
Common pathogens	Respiratory viruses, *Streptococcus pneumoniae, Haemophilus influenzae, Moraxella catarrhalis*

Antibiotic treatment	**Otitis media**
First choice	**Amoxicillin** **Child:** 15 mg/kg/dose, three times daily, for five days (seven to ten days if age < two years, underlying medical condition or perforated ear drum) Use 30 mg/kg/dose, three times daily, for five to seven days in severe or recurrent infection (maximum 500 mg/dose age three months to five years, 1000 mg/dose age > five years)
Alternatives	**Co-trimoxazole** **Child > 6 weeks:** 0.5 mL/kg/dose oral liquid (40+200 mg/5 mL), twice daily, for five to seven days (maximum 20 mL/dose) If a child can swallow tablets, co-trimoxazole 80+400 mg tablets can be used (one tablet is equivalent to 10 mL of co-trimoxazole oral liquid) N.B. Co-trimoxazole should be avoided in infants aged under six weeks, due to the risk of hyperbilirubinaemia.

Pharyngitis *updated October, 2015*

Management	Most pharyngitis is of viral origin. The major benefit of treating *Streptococcus pyogenes* pharyngitis is to prevent rheumatic fever, therefore antibiotic treatment is recommended for those at increased risk of rheumatic fever, i.e. if the patient has a history of past rheumatic fever, is of Māori or Pacific ethnicity, or is living in a lower socioeconomic area of the North Island, and is aged 3 – 45 years. Patients who fulfil one or more of these criteria, and who have features of group A streptococcus infection: temperature >38°C, tender cervical nodes, tonsillar swelling or exudate, and no cough, especially if aged 3–14 years, should have a throat swab taken and empiric antibiotic treatment either started immediately or if *Streptococcus pyogenes* is isolated from the swab. **Avoid amoxicillin** if infectious mononucleosis (EBV) is suspected due to an increased risk of rash.
Common pathogens	Respiratory viruses, *Streptococcus pyogenes*

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Ear, nose and throat (continued)

Antibiotic treatment	**Pharyngitis**
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, once daily, OR 25 mg/kg, twice daily (maximum 1000 mg/day), for ten days **Child ≥ 30 kg** and **Adults:** 1000 mg, once 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:** 20 mg/kg/dose, twice daily or 10 mg/kg/dose, four times daily, for ten days (maximum 1 g/day) **Adult:** 400 mg, twice daily, for ten days N.B. Co-trimoxazole does not have reliable activity against *S. pyogenes* or eradicate pharyngeal carriage and should not be used.

Sinusitis – acute

Management	Most patients with sinusitis will not have a bacterial infection. Even for those that do, antibiotics only offer a marginal benefit and symptoms will resolve in most patients in 14 days, without antibiotics. Consider antibiotics for patients with severe sinusitis symptoms (e.g. purulent nasal discharge, nasal congestion and/or facial pain or pressure) for more than five to seven days plus any of the following features: fever, unilateral maxillary sinus tenderness, severe headache, symptoms worsening after initial improvement.
Common pathogens	Respiratory viruses, *Streptococcus pneumoniae, Haemophilus influenzae, Moraxella catarrhalis*, anaerobic bacteria
Antibiotic treatment	**Sinusitis (acute)**
First choice	**Amoxicillin** **Child:** 15 mg/kg/dose, three times daily, for seven days Use 30 mg/kg/dose, three times daily, for seven days in severe or recurrent infection (maximum 500 mg/dose age three months to five years, 1000 mg/dose age > five years)

Antibiotic treatment	**Sinusitis (acute) – continued**
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:** 10 mg/kg/dose (amoxicillin component), three times daily, for seven days (maximum 500 mg/dose amoxicillin component) **Adult:** 500+125 mg, three times daily, for seven days

Eyes

Conjunctivitis

Management	Can be viral, bacterial or allergic. Bacterial infection is usually associated with mucopurulent discharge. Most bacterial conjunctivitis is self-limiting and the majority of people improve without treatment, in two to five days. In newborn infants, consider *Chlamydia trachomatis* or *Neisseria gonorrhoeae*, in which case, do not use topical treatment. Collect eye swabs, and refer to a Paediatrician.
Common pathogens	Viruses, *Streptococcus pneumoniae, Haemophilus influenzae, Staphylococcus aureus* Less commonly: *Chlamydia trachomatis* or *Neisseria gonorrhoeae*
Antibiotic treatment	**Conjunctivitis**
First choice	**Chloramphenicol 0.5% eye drops** **Adult** and **child > 2 years:** 1 – 2 drops, every two hours for the first 24 hours, then every four hours +/– chloramphenicol eye ointment at night until 48 hours after symptoms have cleared
Alternatives	**Fusidic acid eye gel** **Adult** and **child:** 1 drop, twice daily until 48 hours after symptoms have cleared

Periorbital cellulitis – see Cellulitus (Page 11)

CNS

Bacterial meningitis and suspected meningococcal sepsis

Management	Immediately refer all people with suspected meningococcal disease (meningitis with non-blanching rash or meningococcal septicaemia) or bacterial meningitis (without a non-blanching rash) to hospital. Give benzylpenicillin before transport to hospital, as long as this does not delay the transfer. Notifiable on suspicion.
Common pathogens	*Neisseria meningitidis, Streptococcus pneumoniae* Less common: *Listeria monocytogenes, Haemophilus influenzae*
Antibiotic treatment	**Bacterial meningitis and suspected meningococcal sepsis**
First choice	**Benzylpenicillin** (penicillin G) **Child < one year:** 300 mg IV or IM **Child one to nine years:** 600 mg IV or IM **Adult** and **child > ten years:** 1.2 g IV or IM
Alternatives	**Ceftriaxone** **Adult** and **child:** 50 – 100 mg/kg up to 2 g IV or IM N.B. Almost any parenterally administered antibiotic in an appropriate dosage will inhibit the growth of meningococci, so if benzylpenicillin or ceftriaxone are not available, give any other penicillin or cephalosporin antibiotic.

Skin

Bites – human and animal (Includes injury to fist from contact with teeth)

Management	Clean and debride wound thoroughly and assess the need for tetanus immunisation. All infected bites should be treated with antibiotics. Prophylactic antibiotic treatment is appropriate for human and cat bites, or dog bites if severe or deep, and any bites that occur to the hand, foot, face, tendon or ligament, or in immunocompromised people. Consider referral 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	**Bites – human and animal**
First choice	**Amoxicillin clavulanate** **Child:** 10 mg/kg/dose (amoxicillin component), three times daily, for seven days (maximum 500 mg/dose, amoxicillin component) **Adult:** 500+125 mg, three times daily, for seven days
Alternatives	**Adult** and **child > 12 years:** **Metronidazole** 400 mg, three times daily, **+ doxycycline** 200 mg on day one, followed by 100 mg, once daily, on days two to seven **Metronidazole + co-trimoxazole** is an alternative for children aged under 12 years (doxycycline contraindicated)

Boils

Management	Most lesions may be treated with incision and drainage alone. Antibiotics may be considered if there is fever, surrounding cellulitis or co-morbidity, e.g. diabetes, or if the lesion is in a site associated with complications, e.g. face. For management of recurrent boils, see: "Recurrent skin infections" (Page 14).
Common pathogens	*Staphylococcus aureus* Consider MRSA if there is a lack of response to flucloxacillin.
Antibiotic treatment	**Boils**
First choice	**Flucloxacillin** **Child:** 12.5 mg/kg/dose, three to four times daily, for seven days **Adult:** 500 mg, four times daily, for five to seven days ***OR*** *(if flucloxacillin not tolerated in children)* **Cephalexin** **Child:** 12.5 – 25 mg/kg/dose, twice daily, for five to seven days
Alternatives	**Cephalexin** **Adult:** 500 mg, four times daily, for five to seven days **Erythromycin** **Child aged < 12 years:** 20 mg/kg/dose, twice daily, or 10 mg/kg/dose, four times daily, for five to seven days (maximum 1 g/day) **Adult:** 800 mg, twice daily, or 400 mg, four times daily, for five to seven days **Co-trimoxazole** (if MRSA present): **Child > 6 weeks:** 0.5 mL/kg oral liquid (40+200 mg/ 5 mL), twice daily, for five to seven days (maximum 20 mL/dose) N.B. Co-trimoxazole should be avoided in infants aged under six weeks, due to the risk of hyperbilirubinaemia. **Adult** and **child >12 years**: 160+800 mg (two tablets), twice daily, for five to seven days

Cellulitis

Management	Keep affected area elevated (if applicable) for comfort and to relieve oedema. Assess response to treatment in seven days. Consider referral for IV antibiotics if cellulitis is severe or systemic symptoms are present, e.g. fever, nausea, vomiting. **For periorbital or facial cellulitis**, in all but very mild cases consider referral for IV antibiotics.
Common pathogens	*Streptococcus pyogenes, Staphylococcus aureus,* Group C or Group G streptococci
Antibiotic treatment	**Cellulitis**
First choice	**Flucloxacillin** **Child:** 12.5 mg/kg/dose, four times daily, for seven days **Adult:** 500 mg, four times daily, for five to seven days ***OR*** *(if flucloxacillin not tolerated)* **Cephalexin** **Child:** 12.5 mg/kg/dose, four times daily, for seven to ten days (maximum 500 mg/dose) **Adult:** 500 mg, four times daily, for seven days
Alternatives	**Cephalexin** **Adult:** 500 mg, four times daily, for seven days **Erythromycin** **Child < 12 years:** 20 mg/kg/dose, twice daily, or 10 mg/kg/dose, four times daily, for seven to ten days (maximum 1 g/day) **Adult:** 800 mg, twice daily, or 400 mg, four times daily, for seven days **Co-trimoxazole** (if MRSA present): **Child > 6 weeks:** 0.5 mL/kg/dose oral liquid (40+200 mg/5 mL), twice daily, for five to seven days (maximum 20 mL/dose) N.B. Co-trimoxazole should be avoided in infants aged under six weeks, due to the risk of hyperbilirubinaemia. **Adult** and **child aged over 12 years:** 160+800 mg (two tablets), twice daily, for five to seven days

Diabetic foot infections

Management	Antibiotics (and culture) are not necessary unless there are signs of infection in the wound. However, in people with diabetes and other conditions where perfusion and immune response are diminished, classical clinical signs of infection are not always present, so the threshold for suspecting infection and testing a wound should be lower. Referral to hospital should be considered if it is suspected that the infection involves the bones of the feet, if there is no sign of healing after four weeks of treatment, or if other complications develop.
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	**Diabetic foot infections**
First choice	**Amoxicillin clavulanate** **Adult:** 500+125 mg, three times daily, for five to seven days
Alternatives	**Cephalexin** 500 mg, four times daily, + **metronidazole** 400 mg, twice to three times daily, for five to seven days ***OR*** (for patients with penicillin hypersensitivity) **Co-trimoxazole** 160+800 mg (two tablets), twice daily, + **clindamycin*** 300 mg, three times daily, for five to seven days * Requires specialist endorsement for > 4 capsules

Impetigo *updated October, 2016*

Management	First-line management in the majority of children with mild to moderate impetigo is good skin hygiene and topical antiseptic preparations. Initial management involves the simple measures of "clean, cut (nails) and cover". Advise moist soaks to gently remove crusts from lesions, keeping affected areas covered and excluding the child from school or preschool until 24 hours after treatment has been initiated. Assess and treat other infected household members. Current expert opinion favours the use of topical antiseptic preparations, such as hydrogen peroxide or povidone-iodine, as first choices for topical treatment. This represents a change in management due to increasingly high rates of fusidic acid resistance in *Staphylococcus aureus* in New Zealand. Fusidic acid resistance in *S. aureus* in New Zealand is also genetically linked to methicillin resistance, so the use of fusidic acid can lead to selection for methicillin resistant *S. aureus* (MRSA).

	Fusidic acid cream or ointment should not be used for wound management, eczema, extensive infection or for prolonged courses (> 5 days). Topical fusidic acid should only be considered as a second-line option for areas of localised impetigo (usually three or less lesions). A randomised controlled trial has been registered to establish the effectiveness of alternative topical management options for impetigo in New Zealand. Oral antibiotics are recommended if lesions are extensive, there is widespread infection, or if systemic symptoms are present. 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 decolonisation (see: "Recurrent skin infections")*. N.B. *Streptococcus pyogenes* has caused outbreaks of necrotising fasciitis in residential care facilities, and if this is suspected it is important to use systemic treatment to eradicate carriage, and prevent infection to others. * Note that the Antibiotics Guide is currently under revision and advice regarding recurrent skin infections may change in the 2017 edition.
Common pathogens	*Streptococcus pyogenes, Staphylococcus aureus*
Antibiotic treatment	**Impetigo**
First choice	**Topical** (localised area of infection): **Hydrogen peroxide 1%** cream apply two to three times daily, for five days ***OR*** **Povidone-iodine 10% ointment** Apply three times daily, for five days **Oral** (extensive/multiple lesions): **Flucloxacillin** **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
Alternatives	**Topical** (localised area of infection): **Fusidic acid 2%** cream or ointment Apply three times daily, for five days If topical treatment fails, use oral treatment as above. **Oral** **Cephalexin** (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

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Alternatives continued	**Erythromycin** (if allergy to flucloxacillin) **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 **Co-trimoxazole** (if MRSA present) **Child > 6 weeks:** 24 mg/kg/dose oral liquid [equivalent to 0.5 mL/kg/dose oral liquid (240 mg/5 mL)], twice daily, for five days (maximum 20 mL/dose) **Child > 12 years** and **Adult:** 960 mg (two tablets), twice daily, for five days

Mastitis

Management	Treat with antibiotic and continue to breast feed from both breasts. 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	**Mastitis**
First choice	**Flucloxacillin** **Adult:** 500 mg, four times daily, for seven days
Antibiotic treatment	**Mastitis – continued**
Alternatives	**Cephalexin** **Adult:** 500 mg, four times daily, for seven days **Erythromycin** **Adult:** 400 mg, four times daily, for seven days Treat mastitis in males or non-lactating females with **amoxicillin clavulanate** 500+125 mg, three times daily, for seven days

Recurrent skin infections *updated October, 2014*

Management	Reducing the risk of recurrent *S. aureus* skin infections among households primarily involves **educating patients and their families about infection control measures and the principles of good hygiene. A formal decolonisation regimen**, using topical antibiotic and antiseptic techniques, is not necessary for all patients, but **may be appropriate for those with recurrent staphylococcal abscesses**. Decolonisation should only begin after acute infection has been treated and has resolved. Treatment to eliminate *S. aureus* colonisation in the most affected member of the household is usually all that is required to prevent recurrences in all household members.

	Take a nasal swab to determine whether the patient has *S. aureus* nasal colonisation and if so, whether the *S. aureus* colonising the patient is sensitive to fusidic acid or mupirocin. As part of the decolonisation treatment, the patient should be advised to shower or bathe for one week using an antiseptic. For a diluted bleach bath, add 1 mL of plain unscented 5% bleach per 1 L of bathwater (or 2 mL of 2.2% bleach per 1 L of water). N.B. A regular-sized bath filled to a depth of 10 cm contains approximately 80 L of water and a baby's bath holds approximately 15 L of water. After immersing in the bath water for 10 – 15 minutes, rinse with fresh water. The bleach bath should be repeated two to three times within the week. Alternatively, patients may shower daily for one week using triclosan 1% or chlorhexidine 4% body wash, applied with a clean cloth (and preferably left on the skin for at least five minutes), particularly focusing on the axillae, groin and perineum. Hair can be washed with the antiseptic also. As *S. aureus* can also colonise the pharynx, an antiseptic throat gargle (e.g. chlorhexidine 0.2% solution, three times daily) is also recommended for the duration of formal decolonisation treatment. Clothing, towels, facecloths, sheets and other linen in the household should be washed then dried on a hot cycle in a clothes dryer, or dried then ironed, at least twice within the one week decolonisation period. Ideally, the household should also replace toothbrushes, razors, roll-on deodorants and skin products. Hair brushes, combs, nail files, nail clippers can be washed in hot water or a dishwasher. Surfaces that are touched frequently, such as door handles, toilet seats and taps, should be wiped daily, using a disinfectant, e.g. alcohol wipes, bleach. Soft furnishings that cannot easily be cleaned, e.g. couches and arm chairs, can be covered in a sheet or blanket that is regularly washed. Bleach baths or antiseptic washing can be carried out intermittently after the initial decolonisation period, to help prevent recurrence of infection. This can also be recommended for patients with recurrent skin infections who have not undergone formal decolonisation.
Antibiotic treatment	**Recurrent skin infections**
First choice	**Fusidic acid 2% cream or ointment** (if isolate sensitive to fusidic acid) **Mupirocin 2% ointment** (if isolate resistant to fusidic acid and sensitive to mupirocin) Apply inside the nostrils with a cotton bud or finger, twice daily, for five days N.B. If the isolate is resistant to both fusidic acid and mupirocin, topical treatment is not indicated – discuss with an infectious diseases specialist
Alternatives	Nil

Gastrointestinal

Campylobacter enterocolitis

Management	Most people will recover with symptomatic treatment only. Antibiotics have little impact on the duration and severity of symptoms but eradicate stool carriage. Treatment is indicated for severe or prolonged infection, for pregnant women nearing term and for people who are immunocompromised. Treatment may also be appropriate for food handlers, childcare workers and those caring for immunocompromised patients. Campylobacter enterocolitis is a notifiable disease.
Common pathogens	*Campylobacter jejuni*
Antibiotic treatment	**Campylobacter enterocolitis**
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	Disease is due to overgrowth of the colon with *Clostridium difficile* which produces toxins. A common cause is broad spectrum antibiotic treatment. Discontinue current antibiotic treatment if/when possible – in some cases this may lead to clinical resolution of symptoms. Antibiotic treatment is recommended in adults if the patient has diarrhoea or other symptoms consistent with colitis, and a positive test for *C. difficile* toxin. 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, and antibiotic treatment is not generally required in the community setting. Antidiarrhoeals, e.g. loperamide, should be avoided as the toxin may be retained and worsen colitis.
Common pathogens	*Clostridium difficile*
Antibiotic treatment	***Clostridium difficile* colitis**
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.

Giardiasis

Management	Antibiotic treatment is recommended for people who have tested positive for the organism, and symptomatic contacts. Avoid lactose-containing foods for one month after treatment. Giardiasis is a notifiable disease.
Common pathogens	*Giardia lamblia*
Antibiotic treatment	**Giardiasis**
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	Routine treatment with antibiotics is usually unnecessary and may prolong excretion. Treat patients with severe disease, those who are immunocompromised and those with prosthetic vascular grafts. Discuss appropriate treatment for children with an infectious diseases physician. Salmonellosis is a notifiable disease.
Common pathogens	*Salmonella enteritidis, Salmonella typhimurium*
Antibiotic treatment	**Salmonella enterocolitis**
First choice	**Ciprofloxacin** **Adult:** 500 mg, twice daily, for three days
Alternatives	**Co-trimoxazole** **Adult:** 160+800 mg (two tablets), twice daily, for three days

Genito-urinary

Bacterial vaginosis

Management	Women with bacterial vaginosis are often asymptomatic. It is not usually necessary to treat bacterial vaginosis unless symptoms are present or an invasive procedure is planned, e.g. insertion of an IUD or termination of pregnancy. Treatment of male sexual contacts is not usually necessary.
Common pathogens	*Gardnerella vaginalis, Bacteroides, Peptostreptococci, Mobilunculus* and others
Antibiotic treatment	**Bacterial vaginosis**
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 may be used instead of metronidazole, but is not recommended in women who are pregnant as no study data is available

Chlamydia

Management	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, or if symptoms do not resolve. Repeat STI screen in three months for patients with confirmed chlamydia.
Common pathogens	*Chlamydia trachomatis*
Antibiotic treatment	**Chlamydia**
First choice	**Azithromycin** **Adult:** 1 g, stat ***OR*** **Doxycycline** **Adult:** 100 mg, twice daily, for seven days. Do not use in pregnancy or breast feeding.
Alternatives	**Amoxicillin** 500 mg, three times daily, for seven days (only in women who are pregnant who are unable to take azithromycin)

Epididymo-orchitis

Management	Epididymo-orchitis may occur due to a variety of pathogens, but 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. Test for chlamydia, gonorrhoea and UTI. If symptoms are initially severe or signs and symptoms do not resolve (or worsen) after 24 to 48 hours, refer to hospital.
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	**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** 500+125 mg, three times daily, for 10 days (if UTI pathogens suspected and contraindications to quinolones)

Gonorrhoea

Management	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 or if symptoms do not resolve. Repeat STI screen in three months for patients with confirmed gonorrhoea. As co-infection with chlamydia is very common, azithromycin is also routinely given.
Common pathogens	*Neisseria gonorrhoeae*
Antibiotic treatment	**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 pregnancy and breastfeeding)
Alternatives	**Ciprofloxacin** 500 mg, stat **+ azithromycin** 1 g, stat, only if the isolate is known to be ciprofloxacin sensitive. Resistance rates vary by location.

Pelvic inflammatory disease

Management	Pelvic inflammatory disease (PID) is usually caused by a STI, particularly in women aged under 25 years, women who have had recent change of sexual partner or women with a previous history of gonorrhoea or chlamydia. Diagnosis of PID is clinical, taking into account the history, clinical findings and results of tests. However, STI tests will often be negative and a low threshold for treatment is appropriate. Treatment should cover infection with gonorrhoea, chlamydia and anaerobes. Women with severe pelvic inflammatory disease and women who are pregnant require referral for specialist assessment. Hospital admission may be required for IV antibiotics.
Common pathogens	*Chlamydia trachomatis, Neisseria gonorrhoeae* and others

Antibiotic treatment	**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.

Pyelonephritis – acute *updated August, 2015*

Management	Only treat in the community if mild symptoms, e.g. low fever and no nausea or vomiting. If systemically unwell, dehydrated or vomiting refer to hospital for IV treatment. A urine culture and susceptibility test should be performed. Infants and children with pyelonephritis should be referred to hospital for treatment. Nitrofurantoin alone is not an appropriate choice for pyelonephritis as it fails to achieve tissue penetration. Oral trimethoprim might be used in a hospital setting after IV treatment.
Common pathogens	*Escherichia coli, Proteus spp., Klebsiella spp., Enterococcus spp.*
Antibiotic treatment	**Acute pyelonephritis**
First choice	**Co-trimoxazole** **Adult:** 160+800 mg (two tablets), twice daily, for 10 days
Alternatives	**Amoxicillin clavulanate** **Adult:** 500+125 mg, three times daily, for 10 days **Ciprofloxacin** 500 mg, twice daily, for seven days – but should be reserved for isolates resistant to initial empiric choices and avoided during pregnancy

Trichomoniasis

Management	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. Due to low sensitivity, culture of urethral swabs is rarely positive in males, even if infection is present, therefore empirical treatment of male sexual contacts is recommended without testing, along with a STI check. A test of cure is not usually required unless there is a risk of re-exposure.
Common pathogens	*Trichomonas vaginalis*
Antibiotic treatment	**Trichomoniasis**
First choice	**Metronidazole** **Adult:** 2 g, stat Can be used in women who are pregnant or breast feeding, but advise to avoid breastfeeding for 12–24 hours after dose
Alternatives	For those intolerant of the stat dose, use **metronidazole** 400 mg, twice daily, for seven days **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

Urethritis – acute non-specific

Management	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). Treat sexual contacts. 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	**Acute non-specific urethritis**
First choice	**Azithromycin** **Adult:** 1 g, stat *OR* **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
Alternatives	Nil

Urinary tract infection (UTI) – adult *updated October, 2015*

Management	Antibiotic treatment is indicated for all people who are symptomatic. Asymptomatic bacteriuria requires antibiotic treatment in women who are pregnant but not in elderly women or patients with long-term indwelling urinary catheters. Non-pregnant females with uncomplicated UTI do not require a urine culture. However, urine culture is recommended in males, women who are pregnant, and those who fail to respond to empiric treatment within two days. Women who are pregnant should have repeat urine culture one to two weeks after completing treatment to ensure cure.
Common pathogens	*Escherichia coli, Staphylococcus saprophyticus, Proteus spp., Klebsiella spp., Enterococcus spp.*

Antibiotic treatment	**Urinary tract infection (UTI) – adult**
First choice	**Trimethoprim** **Adult:** 300 mg, once daily, for three days (avoid during the first trimester of pregnancy) *OR* **Nitrofurantoin** **Adult:** 50 mg, four times daily, for five days (avoid at 36+ weeks in pregnancy, and in patients with creatinine clearance < 60 mL/min) **Treat for seven days in pregnant women and in males**
Alternatives	**Norfloxacin** **Adult:** 400 mg, twice daily for three days – but should be reserved for isolates resistant to initial empiric choices and avoided during pregnancy

Urinary tract infection (UTI) – child

Management	Refer children aged under three months, those with severe illness, or those with recurrent infection, to hospital. Also consider referral of children aged under six months. Children aged over six months, without renal tract abnormalities, and who do not have acute pyelonephritis, may be treated with a short course (three days) of antibiotics. All children with suspected UTI should have a urine culture collected as a clean specimen (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	**Urinary tract infection (UTI) – child**
First choice	**Co-trimoxazole** **Child:** 0.5 mL/kg/dose oral liquid (40+200 mg/ 5 mL), twice daily, for three days (maximum 20 mL/dose) If a child can swallow tablets, co-trimoxazole 80+400 mg tablets can be used (one tablet is equivalent to 10 mL of co-trimoxazole oral liquid)
Alternatives	**Cefaclor** **Child:** 8 – 10 mg/kg/dose, three times daily, for three days (maximum 500 mg/dose) **Amoxicillin clavulanate** **Child:** 10 mg/kg/dose (amoxicillin component), three times daily, for three days (maximum 500 mg/dose,amoxicillin component)

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1 Respiratory

Respiratory

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

4 E.N.T.

Ear, nose and throat

Otitis externa – acute
Otitis media
Pharyngitis
Sinusitis – acute

7 Eyes

Eyes

Conjunctivitis

8 CNS

CNS

Bacterial meningitis and suspected meningococcal sepsis

9 Skin

Skin

Bites – human and animal (includes injury to fist from contact with teeth)
Boils
Cellulitis
Diabetic foot infections
Impetigo
Mastitis
Recurrent skin infections

16 Gastrointestinal

Gastrointestinal

Campylobacter enterocolitis
Clostridium difficile colitis
Giardiasis
Salmonella enterocolitis

20 Genito-urinary

Genito-urinary

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