

# Management of infection guidelines for primary and community services

## Aims of these guidelines

- To encourage the rational and cost-effective use of antibiotics.
- To minimise the emergence of bacterial resistance in the community.
- To minimise infections caused by MRSA, C. difficile, resistant UTI and support the ambition of reducing inappropriate prescribing in primary care by avoiding use of quinolones, cephalosporins, co-amoxiclav.
- To provide a simple, best guess approach to the treatment of common infections.

Adapted following NICE- PHE antimicrobial prescribing guidance - managing common infections, along with recommendations and practical advices from Royal Cornwall Hospital Trust.

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## Principles of treatment

- This guidance is based on the best available evidence but its application must be modified by professional judgement and any knowledge of previous culture results e.g. flucloxacillin is very rarely a good choice in patients colonised with MRSA. A dose and duration of treatment is suggested, but may need modification for age, weight, renal function or if immunocompromised. In severe or recurrent cases consider a larger dose or longer course.
- Use simple, generic antibiotics if possible. Avoid broad spectrum antibiotics ( e.g. co-amoxiclav, quinolones and cephalosporins) when narrow spectrum antibiotics remain effective, as broad spectrum antibiotics increase the risk of side effects, *clostridium difficile* infection, MRSA and future resistant infections in exposed patients).
- Prescribe an antibiotic only when there is likely to be a clear clinical benefit. This guidance should not be used in isolation; it should be supported with patient information about safety netting, back-up antibiotics, self-care, infection severity and usual duration, clinical staff education and audits. Materials are available on the [RCGP TARGET website](#) and [NICE guidance visual summaries](#). Do not prescribe an antibiotic for viral sore throat, simple coughs and colds. Limit prescribing over the telephone to exceptional cases.
- Consider for empiric treatment: Does the patient have a bacterial infection? Is an antibiotic treatment necessary? Have relevant specimens been collected? Is the patient allergic to any antibiotics?
- In severe infections, immunocompromised or high-risk of complications, give immediate antibiotic and always consider possibility of sepsis.
- Do not use penicillin, amoxicillin, co-amoxiclav, flucloxacillin, pivmecillinam or piperacillin/tazobactam in patients who are allergic to penicillin. Please assess nature of allergy status to distinguish intolerance from true allergy. Previous anaphylaxis following penicillin: do not use any of the above or cephalosporins.
- Hypersensitivity to penicillin
  - i. True allergic reactions to penicillins occur in 1% of exposed individuals but reported in 10% of patients; anaphylactic reactions occur in fewer than 0.05% of treated patients. If nature of the reported allergic reaction is unknown, avoid the use of the antibiotic concerned if there is a reasonable alternative.
  - ii. Self-reported penicillin allergy is relatively common. It is important therefore to clarify the reaction the patient experienced (endorse reaction in detail in drug allergy or sensitivities section of patients electronic record). In some cases it is simply a common side effect of the drug (e.g. diarrhoea or vomiting) rather than true allergic reaction (e.g. rash, angioedema or anaphylaxis). Patients with true allergy to- the beta-lactam ring in penicillin molecules will react to all penicillins e.g. Penicillin V, Amoxicillin, Flucloxacillin and Co-Amoxiclav. If they react to one of the penicillin molecule side chains then they may also have a crossover-allergy to other  $\beta$ -Lactams (e.g. cephalosporins) that share similar side chains. The risk of crossover is quoted as between 1% and 10% for cephalosporins (e.g. cefalexin) with the risk dependant of side chain similarities. If the patient reports a mild reaction to penicillins (e.g. rash alone, with no symptoms of anaphylaxis) cephalosporins may still be used - patients should be made aware of the signs and symptoms of an allergic reaction and seek immediate medical advice. Patients with serious allergic symptoms to penicillins (i.e. anaphylaxis, breathing difficulties, facial swelling or major skin reactions) should avoid cephalosporins and alternative agents be administered. For further advice on antibiotic choice please contact a consultant microbiologist.

- Do not use tetracycline or doxycycline in children under 12 years, pregnant women or patients with a history of tetracycline allergy. Doxycycline can be given with food/dairy products but not with antacids.
- In pregnancy, where possible, avoid tetracycline, aminoglycosides, quinolones, azithromycin, clarithromycin and high dose of metronidazole (2g stat), unless the benefits outweigh the risk. Amoxicillin, Erythromycin and cephalosporin are safe in pregnancy. Short-term use of nitrofurantoin is not expected to cause foetal problems (theoretical risk of neonatal haemolysis). Trimethoprim is also unlikely to cause problems unless poor dietary folate intake, or taking another folate antagonist.
- Current recommendations are that no additional contraceptive precautions are required when non-liver enzyme inducing antibiotics are combined with oral contraceptives, contraceptive patches or vaginal rings unless diarrhoea or vomiting occurs. Anecdotal reports of contraceptive failure have been made with the concomitant use of antifungals.
- Experience in anticoagulant clinics suggests that the INR can be altered by a course of antibiotics or antifungals. Increased frequency of INR monitoring is necessary during and after a course of antibiotics until the INR has stabilized. Cephalosporins, macrolides, tetracyclines, quinolones, metronidazole and trimethoprim seem to cause a particular problem. Contact the anticoagulant clinic for any further advice.
- Avoid use of quinolones unless benefits outweighs risks as evidence indicates that they may be rarely associated with long lasting disabling neuro muscular and skeletal side effects ([drug safety update March 2019](#)). MHRA has also issued a [drug safety update](#) in November 2018, which reported a two-fold increase in risk of aortic aneurism and dissection with older people being at higher risk.
- Once microbiology results are available: treat according to culture results and sensitivity.
- Doses are for oral administration in the main and for adults unless otherwise stated. Please refer to [BNF](#) for further dosing and interaction information (e.g. macrolides and statins) or to the BNFc for [child](#).
- When there is clinical uncertainty about whether a condition is self-limiting or is likely to deteriorate, back-up prescribing (also known as delayed prescribing) offers healthcare professionals an alternative to immediate antimicrobial prescribing. It encourages self-management as a first step, but allows a person to access antimicrobials without another appointment if their condition gets worse. It is important that the patient is given clear instructions about when they should use the prescription.  
A back-up (delayed) prescription with instructions about use can either be given to the patient or left at an agreed location (for example, the local pharmacy) to be collected at a later date. Read codes are available for back-up prescriptions.
- Where a 'best guess' therapy has failed or special circumstances exist, microbiological advice can be obtained from Department of Clinical Microbiology RCHT on 01872 254900 - out of hours call the RCHT switchboard on 01872 250000. Department of Clinical Microbiology Derriford on 01752437745 (Mon-Fri 9am-5pm ) – Out of hours urgent queries via hospital switchboard to bleep on-call Consultant Microbiologist .

Drug option	Dose	Duration
<b>Upper respiratory tract infections</b>		
Consider delayed antibiotic prescriptions.		
<b>Otitis media (child doses)</b>		NICE visual summary code: <a href="#">ng91</a>
Many are viral. OM resolves in 60 percent in 24-hours without antibiotics. Complications unlikely if temp <38.5°C or patient not vomiting. Self-care using ibuprofen or paracetamol as pain relief is adequate in most cases. Consider antibiotics if not settled or worsening in three days.		
Self-care	Self-care with paracetamol or ibuprofen for pain.	
Amoxicillin	Neonate: 30mg/kg TDS 1-11 months: 125mg TDS 1-4 years: 250mg TDS >5 years: 500mg TDS	<p style="text-align: center;"><b>5-7 days</b></p> <p>Based on evidence, the absolute difference in treatment failure with an antibiotic course of less than 7 days compared with a course of 7 days or more is small. If a decision to prescribe an antibiotic is made, a 5-day course may be sufficient for many children, reserving 7-day courses for those with a clinical assessment of more severe or recurrent infection</p>
Penicillin allergy: erythromycin	1 month to 23 months: 125mg QDS 2-7 years: 250mg QDS >8 years: 250-500mg QDS	
<b>OR</b> Clarithromycin	1 month to 11 years: Under 8 kg: 7.5 mg/kg BD 8 to 11 kg: 62.5 mg BD 12 to 19 kg: 125 mg BD 20 to 29 kg: 187.5 mg BD 30 to 40 kg: 250 mg BD 12-18 years: 250mg BD	
<b>Acute diffuse Otitis externa</b>		NICE CKS summary: <a href="https://cks.nice.org.uk/otitis-externa">cks.nice.org.uk/otitis-externa</a>
Oral antibiotics are not recommended for otitis externa; complications need specialist advice, e.g. facial swelling/cellulitis. If there is obstruction of the ear canal, consider need for micro-suction (may need referral to ENT/aural care). If pain cannot be controlled consider early urgent referral to ENT/aural care service. Patients prescribed antibiotic/steroid drops can expect their symptoms to last for approximately six days after treatment has begun. If they have symptoms beyond the first week they should continue the drops until their symptoms resolve (and possibly for a few days after) for a maximum of a further seven days and consideration should be given to referral for micro-suction. Patients with symptoms beyond two weeks should be considered treatment failures and alternative management initiated.		
Self-care	Analgesia for pain relief, and apply localised heat (such as a warm flannel).	
	Acetic acid 2% ear spray (EarCalm, OTC, P medicine) One spray TDS (maximum one spray every two to three hours)	7 days maximum

Drug option	Dose	Duration
<b>Steroid combination ear drops / spray</b>	Sofradex ear drops: 2-3 drops 3-4 times a day for 7 days Flumetasone–clioquinol ear drops: 2-3 drops twice daily for 7-10 days Gentamicin-hydrocortisone ear drops: 2-4 drops 3-4 times a day and at night for 7 days Otomize ear spray: 1 spray 3 times daily for 7 days	
Use of Ciprofloxacin (Cetraxal 2mg/ml) ear drops 0.25ml unit dose for otitis externa is licensed and may be used with specialist ENT input.		
<b>Influenza treatment</b>		
Refer to Public Health England: <a href="http://www.gov.uk/government/collections/seasonal-influenza-guidance-data-and-analysis">www.gov.uk/government/collections/seasonal-influenza-guidance-data-and-analysis</a>		
<b>Pharyngitis / sore throat / tonsillitis</b>		NICE visual summary code: <a href="#">ng84</a>
Avoid antibiotics as 82 percent will resolve in seven days without antibiotics and pain will only be reduced by 16 hours with antibiotics. Use FeverPAIN or Centor criteria to identify people who are more likely to benefit from an antibiotic.		
<b>FeverPAIN criteria</b>	Score 0-1: 13-18% streptococci, no antibiotics indicated. Score 2-3: 34-40% likelihood of streptococci, use no Abx or back-up prescription. Score 4-5: 62-65% likelihood of streptococci, use immediate antibiotic treatment if severe or 48 hour back-up prescription. FeverPAIN online tool: <a href="http://ctu1.phc.ox.ac.uk/feverpain/index.php">ctu1.phc.ox.ac.uk/feverpain/index.php</a>	
<b>Centor criteria</b>	Each of the Centor criteria score one point (maximum score of four). A score of 0, 1 or 2 is thought to be associated with a 3-17% likelihood of isolating streptococcus, no antibiotics indicated. A score of 3-4 is thought to be associated with a 32-56% likelihood of isolating streptococcus, consider an immediate antibiotic prescription or a back-up antibiotic prescription with advice.	
<b>Self-care</b>	No antibiotics. Paracetamol/ibuprofen for pain/fever. Medicated lozenges may help pain in adults.	
<b>Penicillin V</b>	500mg QDS	5 days and 10 days if GAS (Group A Strep) is grown
<b>OR Clarithromycin if allergic to penicillin</b>	500mg BD	5 days
<b>Sinusitis acute or chronic</b>		NICE visual summary code: <a href="#">ng79</a>
Many cases are viral and antibiotics are generally not required. Reserve antibiotics for those systemically very unwell or high risk of complications. Symptoms < 10 days – do not offer antibiotics; advise sinusitis usually last two to three weeks. Symptoms without improvement		

Drug option	Dose	Duration
for > 10 days: consider no antibiotic or back-up antibiotic prescription depending on likelihood of bacterial cause; consider high-dose nasal steroid if aged >12 years.		
Self-care	No antibiotics. Advise paracetamol/ibuprofen for pain/fever. Little evidence that nasal decongestants or saline may help, but people may want to try them as part of self-care.	
Penicillin V for delayed antibiotic	500mg QDS	5 days
OR if allergic to penicillin: Clarithromycin	500mg BD	
OR Doxycycline	200mg stat then 100mg once daily	
Co-Amoxiclav if systemically unwell	625mg TDS	

## Lower respiratory tract infections

Quinolones e.g. Ciprofloxacin are not good first choice antibiotics in respiratory infections as they have poor activity against pneumococci. However, they do have use in proven pseudomonal infections – for example in patients with cystic fibrosis or bronchiectasis.

**Acute bronchitis and acute cough** NICE visual summary code: [ng120](#)

Antibiotics provide little benefit if no co-morbidity. Consider seven day delayed antibiotics with advice. Symptom resolution can take three weeks. Higher risk of complications includes people with pre-existing comorbidity; young children born prematurely, people >65 with ≥2 of, or >80 with ≥1 or more of: hospitalisation in previous year, type 1 or 2 diabetes, history of congestive heart failure, current use of oral steroids. Consider CRP test if antibiotic being considered. If CRP<20mg/L no antibiotics, 20-100mg/L delayed antibiotics, CRP>100mg/L immediate antibiotics. Do not offer mucolytic, oral or inhaled bronchodilator or oral/inhaled corticosteroid unless otherwise indicated.

- Acute cough: Some people may wish to try honey (over 1 year), herbal or cough medicines containing expectorant or suppressants, except codeine, (in over 12 years). These self-care treatments have limited evidence for relief of cough symptoms.
- Acute cough with URTI: No antibiotics
- Acute bronchitis: No routine antibiotic
- Acute cough and higher risk of complications at face to face examination: Immediate or back-up antibiotic
- Acute cough and systemically very unwell at face to face examination: Immediate antibiotic

Doxycycline	200mg stat then 100mg once daily	5 days
OR Amoxicillin	500mg TDS	

**Acute exacerbation of COPD** NICE visual summary code: [ng114](#)

Many cases are viral so will not respond to antibiotics. Consider antibiotics if are needed; but only after taking into account severity of symptoms (sputum colour changes and increases in volume or thickness), need for hospitalisation, previous exacerbations/hospitalisation/risk of complications/sputum culture and susceptibility results and risk of resistance with repeated courses. Antibiotics not indicated in absence of purulent/mucopurulent sputum. Use of rotational antibiotics in COPD is very rarely indicated. Standby antibiotics may be offered to patients who suffer frequent exacerbations with severe COPD who have been counselled on how to use these 'as needed' antibiotics (doxycycline or

Drug option	Dose	Duration
amoxicillin or clarithromycin). Ensure pneumococcal and annual flu vaccination are up to date/optimised. Review those who have used $\geq 3$ standby antibiotics and investigate reasons as per NICE COPD 2018. Ensure regular review on those who are on prophylactic antibiotics.		
<b>Doxycycline</b>	200mg stat then 100mg once daily	5 days
<b>OR Amoxicillin</b>	500mg TDS	
<b>OR Clarithromycin</b>	500mg BD	
<b>Bronchiectasis exacerbation</b>		
High dose antibiotics, as advised by the specialist, generally for two weeks and taken until the patient's improvement has plateaued as measured by improvement in sputum volume and purulence. Please also refer to RMS guidance on <a href="#">Bronchiectasis</a> Send a sputum sample for culture and susceptibility testing. Offer an antibiotic until sputum culture and susceptibility testing are back reviewing the choice of antibiotic. When choosing an antibiotic, take account of severity of symptoms and risk of treatment failure (previous sputum culture with resistant or atypical bacteria, or a higher risk of developing complications).		
<b>Amoxicillin</b>	500mg TDS	7-14 days Course length is based on severity of bronchiectasis, exacerbation history, severity of exacerbation symptoms, previous culture and susceptibility results, and response to treatment.
<b>OR Doxycycline</b>	200 mg on first day, then 100 mg once a day	
<b>OR Clarithromycin</b>	500mg BD	
<b>Community-acquired pneumonia</b>		NICE visual summary code: <a href="#">ng138</a>
Use CRB65 score to guide mortality risk and place of care. Each CRB65 parameter scores 1: <b>Confusion-Abbreviated Mental test (AMT) score &lt;8 or new disorientation in person, place or time</b> <b>Respiratory rate <math>\geq 30</math>/min</b> <b>BP systolic &lt;90 or diastolic <math>\leq 60</math></b> <b>Age <math>\geq 65</math></b> Score 3-4 high severity: urgent hospital admission Score 1-2 moderate severity: consider hospital referral (particularly if score 2). Score 0 low risk: consider home based care. Always give safety net advice and likely duration of symptoms Mycoplasma is rare in over 65s. Consider legionella in travellers. Do not use doxycycline in children or pregnant women.		
If <b>CRB65 score 0</b> prescribe monotherapy		5 days Stop antibiotic treatment after 5 days unless microbiological results suggest a longer course is needed or the person is not clinically stable (fever in the past 48 hours, or more than 1 sign of clinical instability [systolic BP 100/min, respiratory rate $>24$ /min, arterial oxygen saturation $<90\%$ or PaO <sub>2</sub> <60mmHg in room air
<b>Amoxicillin</b>	500mg TDS	
<b>OR Doxycycline</b>	200mg stat then 100mg once daily	
<b>OR Clarithromycin</b>	500mg BD	
If <b>CRB65 score 1-2</b> prescribe		
<b>Amoxicillin with doxycycline</b>	500mg TDS 200mg stat then 100mg once daily	
<b>OR Clarithromycin</b> (if atypical pathogens suspected)	500mg BD	

1<sup>st</sup> line = Green | 2<sup>nd</sup> line = blue  
 \*Fluoroquinolones –Consider Drug Safety Risk

Drug option	Dose	Duration
<b>Severe CAP in a community hospital setting</b>		
Switch to oral treatment when appropriate guided by bacterial sensitivity results or as for non-severe CAP.		
Piperacillin/tazobactam <b>PLUS Doxycycline</b> OR Clarithromycin by infusion if oral route not available	4.5g IV TDS 200mg stat then 100mg once daily orally	For total course of (IV+ oral) 5 days
Levofloxacin IV for penicillin allergy if oral route not available <b>THEN</b> Levofloxacin orally	500mg IV ONCE daily then 500mg once daily (97% orally absorbed)	For total course (IV + oral) of 5 days
<b>Hospital acquired pneumonia in a community hospital setting</b>		
Non-severe: Amoxicillin <b>PLUS Doxycycline</b>	500mg TDS 200mg stat then 100mg once daily orally	5 days
Severe: Piperacillin/tazobactam	4.5g IV TDS and then treat according to sensitivities <b>THEN</b> amoxicillin and doxycycline for oral switch	For total course of (IV + oral) 5 days
Levofloxacin *IV for penicillin allergy if oral route not available <b>THEN</b> levofloxacin* orally	500mg once daily then orally 500mg once daily	For total course (IV + oral) of 5 days  Antibiotic treatment should be reviewed at 5 days. Stopping the antibiotic should be considered on an individual basis if the person is judged to be clinically stable
<b>Aspiration pneumonia in a community hospital setting</b>		
Contact microbiology if MRSA status is positive. Aspiration pneumonia is a chemical injury caused by inhalation of gastric contents and does not indicate antibiotic treatment per se. Antibiotic should be reserved for patients who fail to improve 48 hours post aspiration or who develop a septic pneumonia. Initial symptoms are due to pneumonitis rather than infection.		
Amoxicillin - community acquired non-severe aspiration pneumonia <b>PLUS Metronidazole</b>	500mg TDS 400mg TDS	5 days
Metronidazole If history of penicillin allergy <b>PLUS EITHER</b> Clarithromycin <b>OR</b> Doxycycline	400mg TDS 500mg BD 200mg stat then 100mg daily	5 days
Piperacillin/tazobactam - hospital acquired severe aspiration pneumonia	4.5g IV TDS	5 days

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Drug option	Dose	Duration
<b>COVID-19 pneumonia in adults in the community</b>		NICE visual summary code: <a href="#">ng165</a>
As COVID-19 becomes more prevalent in the community, pneumonia is more likely to be caused by the COVID-19 virus than a bacteria. Viral pneumonia will not respond to the use of antibiotics therefore patients should only be offered if bacteria are the likely cause, or if it is unclear whether the cause is bacterial or viral and symptoms are more concerning or the person is at high risk of developing complications. People should seek medical help without delay if their symptoms don't improve or worsen rapidly, whether they have been given an antibiotic or not. When possible, clinicians should discuss the risks, benefits and possible likely outcomes of treatment options with patients with COVID-19, and their families and carers, so that they can express their preferences about their treatment.		
<a href="#">Doxycycline</a> OR Amoxicillin	200mg stat then 100mg daily 500mg TDS	5 days
<b>Meningitis</b>		
<b>Suspected meningococcal disease</b>		
Transfer all patients to hospital immediately. Only give benzylpenicillin / cefotaxime if time before admission and patient has non-blanching rash.		
<a href="#">IV Benzylpenicillin</a> OR IM if a vein cannot be found	Adults and children 10 years and over: 1200mg 1-9 years: 600mg 1 month - 1 year: 300mg Neonate: 50mg/Kg	
Cefotaxime if history of penicillin allergy ( <b>not</b> anaphylaxis)	Adults and children 12 years and over: 1g IV/IM stat 1 month -11years: 50mg/kg IV/IM stat	
<b>Prevention of secondary cases of meningitis</b>		
Only prescribe following advice from Health Protection Unit - open 9am to 5pm - call 0300 303 8162. Out of hours: Contact on-call doctor / nurse for the Health Protection Unit via RCHT switchboard: 01872 250000.		
<b>Urinary tract infections</b>		
Amoxicillin resistance is common, therefore only use if culture confirms susceptibility. In the elderly (>65 years), <b>do not treat asymptomatic bacteriuria</b> i.e. positive urine dipstick for nitrite and leucocytes; it occurs in 25 percent of women and 10 percent of men and is not associated with increased morbidity. In the presence of a catheter, antibiotics will not eradicate bacteriuria; only treat if systemically unwell or pyelonephritis likely. As E-coli bacteraemia in the community is increasing always safety net and consider risks for resistance. Use TARGET UTI leaflet available here: <a href="http://www.rcgp.org.uk/TARGETantibiotics">www.rcgp.org.uk/TARGETantibiotics</a> and 'Care Home UTI Management Tool for persons > 65 leaflet' available here: <a href="http://www.eclipsesolutions.org/cornwall">www.eclipsesolutions.org/cornwall</a> .		
<b>Uncomplicated UTI i.e. no fever or flank pain</b>		NICE visual summary code: <a href="#">ng109</a>
Self-care options to relieve symptoms include paracetamol, NSAIDs (e.g. Ibuprofen) and encourage intake of fluids to avoid dehydration.		

1<sup>st</sup> line = Green | 2<sup>nd</sup> line = blue

\*Fluoroquinolones –Consider Drug Safety Risk

Drug option	Dose	Duration
<p><b>In women over 65yrs</b> use signs/symptoms to guide treatment; <b>Do not dipstick test:</b> Asymptomatic bacteriuria is common in older patients.</p> <ul style="list-style-type: none"> <li>• new onset dysuria alone</li> </ul> <p>OR two or more:</p> <ul style="list-style-type: none"> <li>• temperature 1.5°C above patient's normal twice in the last 12hr • new frequency or urgency • new incontinence • new or worsening delirium/debility • new suprapubic pain • visible haematuria</li> </ul> <p>If fever and delirium/debility only: consider other causes before treating for UTI</p> <p><a href="https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/829721/Diagnosis_of_urinary_tract_infections_UTI_diagnostic_flowchart.pdf">https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/829721/Diagnosis_of_urinary_tract_infections_UTI_diagnostic_flowchart.pdf</a></p> <p><b>In women &lt;65yrs</b> use signs/symptoms to guide treatment:</p> <ul style="list-style-type: none"> <li>• Dysuria • urine cloudiness • new nocturia</li> </ul> <ul style="list-style-type: none"> <li>- Two or more of these 3 signs/symptoms, patient is likely to have a UTI: consider immediate antibiotic, or back-up if mild symptoms and woman is not pregnant.</li> <li>- One sign/symptom: UTI possible, 68% will have a culture confirmed UTI (<math>\geq 10^6</math> cfu/L), therefore use urine dipstick to increase diagnostic certainty.</li> <li>- None of the 3: UTI less likely - use urine dipstick if other severe urinary symptoms (frequency, urgency, haematuria, suprapubic tenderness).</li> </ul> <p><b>Dipstick criteria -</b></p> <ul style="list-style-type: none"> <li>• positive nitrite OR positive leukocyte and blood: UTI likely - offer empirical antibiotics for lower UTI OR if milder symptoms (and not pregnant) consider back-up antibiotic with self-care and safety-netting</li> <li>• leukocyte positive but nitrite negative: UTI equally likely to other diagnosis - review time of specimen (morning is best); send urine for culture; use back-up (if not pregnant) or immediate antibiotic depending on symptom severity</li> <li>• ALL nitrite, leukocyte and blood negative: UTI Less likely - consider other diagnosis; reassure; give self-care and safety-netting advice</li> </ul>		
<p>Risk factors for increased resistance include care home resident, recurrent UTI, hospitalisation &gt;7 days in the last six months, unresolving urinary symptoms, recent travel to a country with increased antimicrobial resistance, previous UTI known to be resistant to trimethoprim, cephalosporins or quinolones.</p> <p>First line non-pregnant women: Back up antibiotic (to use if no improvement in 48 hours or symptoms worsening) or immediate antibiotic.</p> <p>Pregnant women, men children or young people: immediate antibiotic.</p> <p>In women with symptoms of vaginal itch or discharge, explore alternative diagnoses and consider pelvic examination.</p> <p>Treating does not reduce mortality or prevent symptomatic episodes, but does increase side-effects and antibiotic resistance</p>		
<p><b>Nitrofurantoin</b> if GFR &gt;45ml/min. If GFR 30-45ml/min: only use if resistance testing indicates no alternative.</p>	<p>100mg BD (modified-release capsules) <b>OR</b> 50mg QDS (immediate release) Suspension – expensive +++. Capsules cannot be opened and the tablets should not be crushed as they are an irritant.</p>	<p>Females - 3 days Males - 7 days</p>
<p><b>Trimethoprim</b> if low risk of resistance</p>	<p>200mg BD</p>	

Drug option	Dose	Duration
	Suspension available.	
<b>OR</b> Pivmecillinam (type of penicillin – do not use if history of penicillin allergy)	400mg stat then 200mg TDS (400mg if high resistance risk) for 5 days. Unlicensed use: manufacturers advise tablets can be crushed and dissolved in a neutral (e.g. water or tea not fruit juice) rather than acidic liquid but may have a bitter taste.	
Treatment failure: depends on susceptibility of organism isolated. For infections due to resistant coliforms including ESBL, oral options are very limited. Fosfomycin is an option where sensitivity report indicates susceptibility. Available from community pharmacy. Prescribe as Monuril as cost effective brand. Women: 3g stat; men: 3g stat plus 2 <sup>nd</sup> 3g dose 72 hours later. If know ESBL carrier then antibiotic choice guided by previous microbiology results.		
<b>Acute prostatitis</b>		NICE visual summary code: <a href="#">ng110</a>
Send MSU for culture and start antibiotic.		
Ciprofloxacin *	500mg BD	14 days and review either to stop or continue further 14 days
Trimethoprim if sensitive	200mg BD	
Review antibiotic treatment after 14 days and either stop the antibiotic or continue for a further 14 days if needed, based on an assessment of the person's history, symptoms, clinical examination, urine and blood tests.		
<b>Acute pyelonephritis</b>		NICE visual summary code: <a href="#">ng111</a>
<b>Always send culture.</b> Cefalexin until sensitivity results are available and then treat according to sensitivity results. If no organism isolated continue Cefalexin. If no response within 24 hours consider referral. If ESBL risk and on advice from microbiologist, consider IV antibiotic via acute care at home.		
Cefalexin	500mg TDS	7-10 days
<b>OR</b> if organism sensitive: Trimethoprim	200mg BD	14 days
<b>Catheter associated bacteriuria</b>		
If asymptomatic, no antibiotics. Don't swab catheters.		
<b>Lower UTI in patients with an indwelling catheter</b>		
Do not treat asymptomatic bacteriuria. Considerable clinical judgement is required to diagnose UTI in patients with an indwelling urinary catheter, and urinalysis of catheterised patients is not recommended to diagnose UTI. Treatment may be indicated if there are signs of local infection e.g. suprapubic pain. If symptoms are severe (e.g. confusion, tachypnoea, tachycardia, hypotension, reduced urine output), admit to hospital as intravenous antibiotics may be required. Check that the catheter is correctly positioned and not blocked. Where there is symptomatic UTI, commence antibiotic and arrange to renew catheter if it has been in place for more than a week. The need for an indwelling catheter should be reviewed. If there is fever, or loin pain, or both, manage as upper UTI (acute pyelonephritis). Otherwise, treat for lower UTI: Relieve symptoms with paracetamol or ibuprofen. Send urine for culture and microscopy before starting antibiotic treatment. If symptoms are		

1<sup>st</sup> line = Green | 2<sup>nd</sup> line = blue

\*Fluoroquinolones –Consider Drug Safety Risk

Drug option	Dose	Duration
<p>moderate or severe, empirically prescribe nitrofurantoin or pivmecillinam for seven days. Follow up after 48 hours (or according to the clinical situation) to check response to treatment and the result of urine culture.</p>		
<b>Prophylaxis for recurrent UTI in women</b>		NICE visual summary code: <a href="#">ng112</a>
<ul style="list-style-type: none"> <li>• Three or more in 12 months; positive MSU or dipstick with positive history. Long term antibiotics are associated with various risks.</li> <li>• If abdominal ultrasound abnormal refer to urology. If abdominal ultrasound normal, offer lifestyle advice, consider topical oestrogens for atrophic vaginitis. Self-care with D-mannose or cranberry if appropriate to reduce the risk of UTI.</li> <li>• Consider use of standby or post-coital antibiotics which may reduce recurrence. Least favoured option is to offer six month trial of low-dose continuous antibiotic treatment: Trimethoprim 100mg every night, or Nitrofurantoin (note: as per January 2020, 100mg standard tablets 1x nocte is the most cost effective option for prophylaxis) or Methenamine hippurate (Hiprex®) 1g BD. Stop after six months and evaluate.</li> <li>• Safety issue with trimethoprim: can cause hyperkalaemia, particularly in the elderly, patients with renal impairment or in patients receiving ACE inhibitors, angiotensin receptor blockers or potassium sparing diuretics. Close monitoring of potassium is advised.</li> <li>• Safety issue with nitrofurantoin: rarely can cause pulmonary toxicity (acutely, sub-acutely and chronically), hepatic toxicity (cholestatic jaundice and chronic active hepatitis), renal impairment and neurological toxicity (peripheral neuropathy including optical neuritis). Close monitoring of liver function, renal function and pulmonary symptoms is advised.</li> <li>• For breakthrough infection, change antibiotics according to sensitivities, treat for seven days maximum (seven days in men, five days in women) and then continue prophylaxis. If <math>\geq 2</math> acute UTI while on prophylaxis antibiotics - stop prophylactic treatment as trial of prophylaxis has failed.</li> <li>• Guidance for management of recurrent UTI in women is available on the <a href="#">Cornwall Joint Formulary website</a> under chapter five - 'Important local documents' tab.</li> </ul>		
<b>Staph aureus in urine</b>		
<p>Staph aureus (MRSA or MSSA) is not a urinary pathogen unless renal or prostatic abscess present. Staph aureus is usually present in urine as a contaminant or colonising a catheter. It is rarely due to deep infection, Staph aureus bacteraemia or endocarditis. Discuss with clinical microbiology if treatment is thought necessary.</p>		
<b>UTI in pregnancy</b>		
<p>Send MSU for culture. Avoid Trimethoprim in first trimester. Avoid Nitrofurantoin in third trimester.</p>		
Nitrofurantoin	MR 100mg BD or IR 50mg QDS	7 days
OR Trimethoprim if Nitrofurantoin unsuitable	200mg BD	
Cefalexin	500mg BD	

Drug option	Dose	Duration
<b>Gastro-intestinal tract infections</b>		
<b>Acute Cholecystitis</b>		
Urgent admission to secondary care is recommended because of high mortality rate. Please also refer to <a href="#">RMS</a> Guidance on Acute Cholecystitis.		
Co-amoxiclav for mild cases	625mg TDS	7 days
OR Ciprofloxacin - if penicillin allergic	500mg BD	
<b>Clostridium difficile</b>		
Stop current antibiotics, antimotility drugs (e.g. Loperamide) and PPIs if possible.		
<ul style="list-style-type: none"> <li>• <b>Not severe:</b> WCC&lt;15x10<sup>9</sup>/L, albumin&gt;25g/L): Do not start treatment if diarrhoea has stopped. Mild cases (&lt;4 episodes / day) may respond without metronidazole.</li> <li>• Oral <b>Metronidazole</b> 400mg TDS for 14 days. If unresolved after four days switch to oral <b>Vancomycin</b> 125mg QDS for 14 days.</li> <li>• Refer to hospital if diarrhoea is still present after toxin result reported and any of the following symptoms are present: fever, dehydration, sepsis, severe abdominal pain, abdominal distension or vomiting. On microbiology advice: Fidaxomicin 200mg BD for 10 days (note this is a high cost medication; please only prescribe on microbiology advice).</li> <li>• <b>Severe:</b> Underlying inflammatory bowel disease or passing &gt;8 stools in 24 hours with WCC&gt;15x10<sup>9</sup> /L, albumin&lt;25g/L, temperature &gt;38.5°C refer to hospital.</li> <li>• <b>Recurrent:</b> Discuss with microbiology.</li> </ul>		
<b>Diverticulitis</b>		
Prescribe paracetamol for pain. Recommend clear liquids only. Gradually reintroduce solid food as symptoms improve over two to three days. Review within 48 hours or sooner if symptoms deteriorate. Arrange admission if symptoms persist or deteriorate.		
Co-amoxiclav	625mg TDS	5 days
OR Ciprofloxacin if penicillin allergic	500mg BD	
AND Metronidazole	400mg TDS	
<b>Eradication of Helicobacter pylori</b>		
<ul style="list-style-type: none"> <li>• Eradication is beneficial in DU, GU, but not in GORD. In non-ulcer dyspepsia, eight percent of patients benefit. Triple treatment attains &gt;85 percent eradication. Do not use clarithromycin or metronidazole if used in the past year for any infection.</li> <li>• When managing symptomatic relapse in DU/GU: Retest (using breath test) for Helicobacter if symptomatic.</li> <li>• When managing symptomatic relapse in non-ulcer dyspepsia: Do not retest, treat as functional dyspepsia.</li> <li>• Seek advice from Gastroenterology if eradication of H pylori is not successful with second-line treatment.</li> </ul>		
Omeprazole PLUS Clarithromycin	20mg BD capsules 500mg BD	7 days

Drug option	Dose	Duration
<b>PLUS</b> Amoxicillin	1g BD	7 days
If penicillin allergic, Omeprazole <b>PLUS</b> Clarithromycin <b>PLUS</b> Metronidazole	20mg BD capsules 250mg BD 400mg BD	
For those who still have symptoms after first-line eradication: Omeprazole <b>PLUS</b> Amoxicillin <b>PLUS EITHER</b> Clarithromycin <b>OR</b> Metronidazole - whichever was not used first-line	20mg BD capsules  1g BD 500mg BD 400mg BD	
<b>Gastroenteritis</b>		
Antibiotic therapy is not usually indicated. Campylobacter infections form 12 percent of GP consultations for gastroenteritis. Antibiotics should be reserved for pregnant, immuno-suppressed, non-responsive or unwell patients. All suspected cases of food poisoning should be notified to the local authority. Seek advice on exclusion of patients from work from the Health Protection Unit on 0300 303 8162.		
<b>Giardiasis</b>		
Avoid using the 2g dose in pregnancy.		
Metronidazole	2g daily	3 days
In pregnancy: Metronidazole	400mg TDS	5 days
<b>Roundworm &gt; 1 year old</b>		
Purchase of over the counter treatment can be recommended except for children under 2, pregnancy and breastfeeding.		
Mebendazole	100mg BD	3 days
<b>Threadworm</b>		
Purchase of over the counter treatment can be recommended except for children under 2, pregnancy and breastfeeding. Treat all household contacts at the same time plus advise hygiene measures. If reinfection occurs, second dose may be needed after two weeks (off-label if less than two years). If less than six months or pregnant (first trimester), use hygiene measures for six weeks. Child <6 months perianal wet wiping/ washes three hourly.		
Mebendazole	Child six months to adult 100mg	Single dose. Repeat in 2 weeks if persistent
<b>Genital tract infections</b>		
1. For sexually transmitted infections treated with antibiotics, the patient should be advised to abstain from sexual intercourse until they and their partner(s) have completed the treatment. GPs should consider referral for treatment, follow-up and contact tracing.		

Drug option	Dose	Duration
2. In cases of recurrent thrush in males consider treating partner(s). There is no indication to treat male partners of women with recurrent candida infection. Please discuss all cases of suspected STI with Brook or GU medicine due to increasing antibiotic resistance.		
<b>Acute epididymo-orchitis</b>		
Check sexual history. Send both first pass urine for Chlamydia Test and MSU for UTI. If gonorrhoea suspected (for example a significant urethral discharge), refer to Brook or GUM.		
Doxycycline	100mg BD	10-14 days
OR Ofloxacin *	200mg BD	14 days
<b>Bacterial vaginosis</b>		
Pregnant patients should not use an applicator for the local treatments.		
Metronidazole	400mg BD	5-7 days
OR Metronidazole	0.75% vaginal gel 5g applicator at night	5 days
OR Clindamycin	2% cream 5g applicator at night	7 days
<b>Candidiasis</b>		
Persistent cases require longer courses (see BASHH guidelines <a href="http://www.bashh.org">www.bashh.org</a> ). Other oral therapy options may be used instead of topical therapy e.g. Itraconazole 200mg orally as two doses eight hours apart, but avoid oral therapy if risk of pregnancy.		
Fluconazole if co-existing vulvitis (except in pregnancy) AND Clotrimazole	150mg stat orally 1% cream	Topical 1% cream for at least 14 days
Clotrimazole	500mg pessary stat	
OR Clotrimazole	100mg pessary	6 nights
<b>Chlamydia trachomatis</b>		
<ul style="list-style-type: none"> <li>Tetracyclines are contraindicated in pregnancy. Ideally, refer to Brook or GUM clinic for treatment, follow up and contact tracing. A test of cure six weeks after treatment is recommended in pregnancy, where compliance is suspect, if symptoms persist or if 'contact tracing' was not felt to have been reliable. It is also recommended if the infection was in a non-genital site or if using Erythromycin or Azithromycin.</li> <li>Azithromycin is not licensed for use in pregnancy in the UK, but is widely used after discussion of options and risk/benefit with the patient.</li> <li>Consider possibility of LGV if Chlamydia positive proctitis- discuss with Brook or GU medicine. A test of cure is recommended for non-genital infection.</li> <li>Mycoplasma genitalium (MGen) is emerging as a significant sexually transmitted pathogen and coinfection rates of three to fifteen percent with chlamydia have been reported. Recent data demonstrate an increasing prevalence of macrolide resistance in MGen, hence a STAT dose of azithromycin is no longer recommended for treatment of uncomplicated chlamydia infection at any site.</li> </ul>		
Doxycycline	100mg BD	7 days

1<sup>st</sup> line = Green | 2<sup>nd</sup> line = blue

\*Fluoroquinolones –Consider Drug Safety Risk

Drug option	Dose	Duration
OR <b>Azithromycin</b>	1g stat orally then 500mg daily for two days	
OR <b>Erythromycin EC</b> - If pregnancy risk	500mg BD	14 days
OR <b>Doxycycline</b> - rectal or throat infection	100mg BD	7 days
<b>Pelvic Inflammatory Disease</b>		
<ul style="list-style-type: none"> <li>Chlamydia is the commonest cause but consider possibility of N.gonorrhoeae as well.</li> <li>Please send endocervical swab for chlamydia and gonorrhoea.</li> <li>Please discuss all suspected gonococcal PID with Brook or GU medicine as antibiotic resistance is now very high.</li> <li>If risk of pregnancy, seek specialist advice.</li> </ul>		
Ceftriaxone 1g single dose i.m. followed by oral <b>Doxycycline</b> 100mg twice daily plus <b>Metronidazole</b> 400mg twice daily for 14 days.		
<b>Chronic genital herpes simplex</b>		
Recurrent episodes are self-limiting and seldom need drug treatment, but if needed to manage future attacks use either episodic antiviral treatment if attacks are infrequent (e.g. less than six attacks per year) or consider self-initiated treatment so antiviral medication can be started early in the next attack.		
<b>Aciclovir</b> for self-initiated treatment	400mg TDS	5 days
Suppressive antiviral treatment (e.g. oral aciclovir 400mg BD for 6-12 months) if attacks are frequent (six or more attacks per year), causing psychological distress, or adverse emotional/social/relationship effects: After 6-12 months, stop treatment for a trial period. If attacks are still considered problematic, restart suppressive treatment. If attacks are not considered problematic (off treatment), control future attacks with episodic antiviral treatment (if needed). If the person has breakthrough attacks on suppressive treatment at any stage seek specialist advice.		
<b>Primary genital herpes simplex</b>		
Take viral swab prior to commencing therapy otherwise opportunity for diagnosis will be lost if first episode.		
<b>Aciclovir</b>	400mg TDS (consider increasing to 400mg five times a day in the immunocompromised or if absorption impaired)	5 days
OR <b>Valaciclovir</b>	500mg BD	
Adjunct treatment: Saline bathing, regular analgesia, lidocaine 5% ointment prn or Hydrogel dressing, antifungals.		
<b>Postnatal infections</b> (e.g. endometritis, postepisiotomy infections of the perineum)		
<ul style="list-style-type: none"> <li>Seek specialist advice from Obstetrics if patients have significant systemic symptoms or if symptoms fail to improve after seven days. Consider endometritis if there is new/ changed and offensive discharge within 10 days post-partum.</li> <li>Co-amoxiclav, cefalexin and metronidazole are all present in breast milk but are safe to use in breast-feeding mothers. Breast-fed infants of mothers taking these antibiotics should be observed for diarrhoea or rashes.</li> </ul>		
<b>Co-amoxiclav</b>	625mg TDS	5 to 7 days

1<sup>st</sup> line = Green | 2<sup>nd</sup> line = blue

\*Fluoroquinolones –Consider Drug Safety Risk

Drug option	Dose	Duration
<b>OR</b> non-anaphylaxis allergy to penicillin: Cefalexin <b>PLUS</b> Metronidazole	500mg BD 400mg TDS	
<b>Trichomoniasis</b>		
Treat partners simultaneously. Refer to Brook or GUM for contact tracing. Pregnant/breast feeding patients should avoid the 2g stat dose.		
Metronidazole	400mg BD	7 days
<b>OR</b> Metronidazole	2g as single stat dose	
<b>Skin / soft tissue infections</b>		
<b>Animal / human bites</b>		
Thorough irrigation is important. Assess, as appropriate, risk of tetanus, HIV, hepatitis B&C, rabies. Prophylaxis should be given after bites unless seen three days after and no evidence of infections. This guidance does not cover insect bites.		
<ul style="list-style-type: none"> <li>• Cat: always give prophylaxis</li> <li>• Dog: give prophylaxis if: puncture wound, bite to hand, foot, face, joint, tendon or ligament, immunocompromised; cirrhotic; asplenic; or presence of prosthetic valve/joint.</li> </ul>		
Co-Amoxiclav	625mg TDS	7 days
<b>OR</b> if allergic to penicillin (animal bites): Metronidazole <b>AND</b> Doxycycline	400mg TDS 100mg BD	
<b>OR</b> if allergic to penicillin (human bites): Metronidazole <b>AND</b> Clarithromycin	400mg TDS 500mg BD	
<b>Insect bites and stings</b>		
Medical help is appropriate if secondary infection (worsening erythema, pain or fever) is present, or a large local reaction or systemic reaction develops, Self-care such as the use of cold compresses is advised in the first instance. Evidence in support of painkillers, creams for itching and antihistamines is lacking.		
<b>Cellulitis</b>		NICE visual summary code: <a href="#">ng141</a>
If patient meeting sepsis markers, refer to hospital. If river or sea water exposure, discuss with microbiologist. Consider admission for patient with severe or rapidly deteriorating cellulitis; an uncertain diagnosis with sinister signs or symptoms (e.g. necrotizing fasciitis, lymphangitis, osteomyelitis, septic arthritis); severe systemic illness; comorbidities that may complicate or delay healing; *facial or periorbital cellulitis; lymphoedema or for the very young, elderly or frail people. *mild facial cellulitis can be managed in primary care.		

Drug option	Dose	Duration
Consider marking extent of infection with a single-use surgical marker pen. Manage underlying conditions such as diabetes, venous insufficiency, eczema and oedema. Advise patient to have an adequate fluid intake and elevation of the affected area. If associated with MRSA, follow MRSA advice overleaf on page 21 as flucloxacillin is not effective against MRSA. In penicillin allergy, or if not improving after 2 to 3 days contact microbiology.		
Flucloxacillin	500mg QDS	5-7 days Review at 48- 72hrs or as appropriate. A longer course (up to 14 days in total) may be needed but skin takes time to return to normal, and full resolution at 5 to 7 days is not expected.
OR Clarithromycin	500mg BD	
Co-Amoxiclav for facial cellulitis	625mg TDS	
OR Clarithromycin plus Metronidazole	500mg BD + 400mg TDS	
<b>Cellulitis (managed in hospital)</b>		
If not improving, discuss with microbiology.		
Flucloxacillin	1g IV six hourly	5 days with clinical review
THEN Flucloxacillin orally	500mg QDS	
OR Clindamycin	300mg QDS	
OR Teicoplanin for MRSA/infected cannula sites	Three doses of 6mg/kg IV BD THEN 6mg/kg once a day for five days	
<b>Dermatophyte infection of nails</b>		
<ul style="list-style-type: none"> <li>Take nail clippings. Drug therapy should only be initiated if infection is confirmed by microscopy and / or culture and treatment is actually required.</li> <li>Seek specialist advice for persistent dermatophyte infections or children with nail infections. Terbinafine persists in nail keratin for up to nine months after the end of treatment. Therefore benefits may continue after the course is completed.</li> <li>To prevent recurrence: apply weekly 1% topical antifungal cream to entire toe area.</li> <li>Amorolfine 5% nail lacquer is not as effective (can be purchased over the counter, mild cases limited up to 2 nails).</li> </ul>		
Terbinafine	250mg OD daily Periodic monitoring of LFTs (after 4-6 weeks of treatment)	Fingers: 6 weeks Toes: 12 weeks
OR Itraconazole	200mg BD for one week	Fingers: 2 courses Toes: 3 courses
<b>Dermatophyte infection of the skin</b>		
Take skin scrapings for culture. Treatment: One week topical terbinafine is as effective as four weeks topical azole. If intractable consider oral itraconazole. Discuss scalp infections with specialist. Topical undecenoates (Mycota) for athlete's foot only.		
Terbinafine (topical 1%)	Applied daily/twice daily	1-4 weeks
Topical Azole	Applied daily/twice daily	4-6 weeks

Drug option	Dose		Duration
<b>OR Topical undecenoic acid (Mycota cream)</b>			4-6 weeks
<b>Impetigo</b>			NICE visual summary code: <a href="#">ng153</a>
Do not offer combination treatment with a topical and oral antibiotic to treat impetigo. Extended or recurrent use of topical fusidic acid or mupirocin may increase the risk of developing antimicrobial resistance.			
<i>Localised non-bullous impetigo:</i> Consider hydrogen peroxide 1% cream			
<ul style="list-style-type: none"> <li>• Other topical antiseptics are available for superficial skin infections, but no evidence was found.</li> <li>• If hydrogen peroxide is unsuitable, offer a short course of a topical antibiotic.</li> </ul>			
<i>Widespread non-bullous impetigo:</i> Offer a short course of a topical or oral antibiotic, taking account of prescribing considerations			
<i>Bullous impetigo or systemically unwell or at high risk of complications:</i> Offer a short course of an oral antibiotic.			
Reassess if symptoms worsen rapidly or significantly, or have not improved after treatment, taking account of:			
<ul style="list-style-type: none"> <li>• alternative diagnoses, such as herpes simplex</li> <li>• any symptoms or signs suggesting a more serious illness or condition, such as a cellulitis</li> <li>• previous antibiotic use, which may have led to resistant bacteria</li> </ul>			
<b>Hydrogen peroxide 1%</b> (Crystacide cream 1%)	Apply BD-TDS	Apply BD-TDS	5 days
<b>Fusidic acid 2%</b>	Apply TDS	Apply TDS	
<b>OR Mupirocin 2%</b> (if resistance suspected)	Apply TDS	Apply TDS	
Flucloxacillin	500mg QDS	1 month to 1 year, 62.5 mg to 125 mg QDS 2 to 9 years, 125 mg to 250 mg QDS 10 to 17 years, 250 mg to 500 mg QDS	
<b>OR clarithromycin</b> if allergic to penicillin	250-500mg BD	1 month to 11 years: under 8 kg, 7.5 mg/kg BD 8 to 11 kg, 62.5 mg BD / 12 to 19 kg, 125 mg BD / 20 to 29 kg, 187.5 mg BD / 30 to 40 kg, 250 mg BD 12 to 17 years, 250 mg BD	
<b>Infective lactation mastitis</b>			
If there is an infected nipple fissure or symptoms have not improved after 12–24 hours despite effective milk removal and/or breast milk culture is positive then prescribe antibiotic. Advise women to continue to breastfeed (involving a breast feeding specialist if required), including on the affected breast or express milk by hand/pump from the affected breast to ensure effective milk removal. Maintaining lactation when a woman has mastitis or breast abscess is important both for her own recovery, to prevent further complications, and for her infant's health. If symptoms fail to settle after 48 hours of first line treatment, send sample of breast milk for microscopy, culture and sensitivities. Prescribe an oral antibiotic for all women with non-lactational mastitis. Most episodes of lactational mastitis are caused by <i>Staphylococcus aureus</i> . Penicillins, Cephalosporins and Macrolides are safe choice in breastfeeding. Course length 5 to 7 days if the response to therapy is rapid and complete but longer courses, 10 to 14 days, may reduce the risk of relapse. In the setting of non-severe infection with risk for MRSA, consultant			

1<sup>st</sup> line = Green | 2<sup>nd</sup> line = blue

\*Fluoroquinolones –Consider Drug Safety Risk

Drug option	Dose	Duration
Microbiologist for further advice.		
If breast milk culture available, treat according to sensitivities otherwise: <b>Flucloxacillin</b>	500mg QDS	10–14 days
<b>OR</b> Erythromycin if allergic to penicillin	250-500mg QDS	
<b>OR</b> Clarithromycin	500mg twice a day	
<b>Leg ulcers</b>		NICE visual summary code: <a href="#">ng152</a>
Routine swabs are not recommended. Antibiotics do not improve healing unless active infection. Symptoms and signs of an infected leg ulcer include: • redness or swelling spreading beyond the ulcer • localised warmth • increased pain • fever		
<b>Flucloxacillin</b>	500mg QDS	7 days
<b>Doxycycline</b>	200 mg on first day, then 100 mg once a day (can be increased to 200 mg daily)	
<b>OR</b> Clarithromycin	500 mg BD	
<b>Diabetic foot ulcer</b>		NICE visual summary code: <a href="#">ng19</a>
Diabetic foot infection has at least 2 of: local swelling or induration; erythema; local tenderness or pain; local warmth; purulent discharge. Severity is classified as: Mild: local infection with 0.5 to less than 2cm erythema, Moderate: local infection with more than 2cm erythema or involving deeper structures (such as abscess, osteomyelitis, septic arthritis or fasciitis) patient should be referred for inpatient management in the presence of complication, Severe: local infection with signs of a systemic inflammatory response and refer patient for urgent inpatient management. Swabs should be taken from the deepest part of the cleaned wound after removal of surface contamination and exudate. When infection of a diabetic foot ulcer is clinically suspected the diabetic foot specialist (vascular or orthopaedic) should be consulted at an early stage. Do not offer antibiotics to prevent diabetic foot infection.		
<b>Flucloxacillin</b> (Mild infection)	500mg QDS	7 days
<b>OR</b> Clarithromycin if allergic to penicillin	500mg BD	
Or Doxycycline	200 mg on first day, then 100 mg once a day (can be increased to 200 mg daily)	
<i>COVID-19 advice: where community podiatry have requested a prescription for antibiotics, to support immediate access (same day where possible), for a two week supply of antibiotics - in the first instance we would recommend Clindamycin 300mg QDS (assuming no allergies). If the patient is not responding to clindamycin treatment after 72 hours, or develops diarrhoea, GPs should contact the <a href="#">podiatry team</a> who will provide further advice in consultation with either endocrine or vascular teams.</i>		
<b>MRSA</b>		
If in doubt as to severity of infection, contact clinical microbiology. Minor, localised, not systemic (majority of cases will be sensitive to		

Drug option	Dose	Duration
Doxycycline hence good empirical choice):		
Doxycycline	100mg BD	7-10 days
OR Clarithromycin if reported as sensitive	500mg BD	
<b>MRSA colonisation</b>		
<ul style="list-style-type: none"> <li>For patients unable to use chlorhexidine, Octenisan can be used instead for five days (i.e. daily wash and as a shampoo on two occasions).</li> <li>For colonised large wounds, contact tissue viability service.</li> <li>MRSA infection where patient has signs of sepsis, fever, raised white cell count and CRP: refer to hospital.</li> </ul>		
Mupirocin nasal ointment <b>PLUS</b> Chlorhexidine 4% (Hibiscrub) <b>PLUS</b> Chlorhexidine 4% (Hibiscrub)	Apply eight hourly Washes daily As a shampoo	5 days and use shampoo twice during the 5 days
<b>Panton-Valentine Leukocidin (PVL) staphylococcal infection</b>		
Or recurrent skin infection in young adults. Seek microbiology advice if required and/or refer to the PVL Staphylococcus aureus infection guidelines.		
<b>Varicella and Herpes zoster</b>		
Treatment is only effective if started at onset of infection (i.e. within 24 hours of onset of rash for varicella and within 72 hours for herpes zoster). See BNF/BNF for children for doses for children and immunocompromised patients.		
Aciclovir	800mg five times a day	7 days
OR Valaciclovir	1g TDS	
<b>Eye infections</b>		
<b>Acute infective conjunctivitis</b>		
<p>Most people with infective conjunctivitis get better, without treatment, within one to two weeks and for most people, use of a topical ocular antibiotic makes little difference to recovery. Only when symptoms are severe or likely to become severe, providing serious causes of a red eye can be confidently excluded as most cases are viral or self-limiting. Bacterial causes are very rare.</p> <p>Although contact lens wear is generally safe and comfortable, contact lens wearers are at a greater risk of eye infection, especially soft lenses. Symptoms of microbial keratitis include a sensation of having something in the eye, watery eyes, blurred vision, sensitivity to light, swelling of the upper eyelid and extreme pain. For mild irritation wait a couple of hours after lens removal to see if the symptoms settle. If after removing the lens the eye remains irritable and red, especially if the vision is blurred the patients can get chloramphenicol eye drops + lubrication eye drops over the counter and use both 4-6 times a day. If no improvement or worse in 2 days contact GP. GP can refer using online referral form to Emergency Eye Department if required.</p>		
1 <sup>st</sup> line: self-care	Bath/clean eyelids with cotton wool dipped in sterile saline or boiled (cooled) water, to remove	

Drug option	Dose	Duration
	crusting.	
2 <sup>nd</sup> line: Chloramphenicol eye drops 0.5%	Every two hours for 48 hours then every four hours	48 hrs after resolution
OR Chloramphenicol 1% eye ointment	Three to four times daily	
3 <sup>rd</sup> line: Fusidic acid 1% eye drops	BD - continue for 48 hours after eye returns to normal (expensive and have less Gram-negative activity)	

## Dental infections

This guidance is not designed to be a definitive guide to oral conditions, as GPs should not be involved in dental treatment. Note: Antibiotics do not cure toothache. First line treatment is with paracetamol and/or ibuprofen, codeine is not effective for toothache.

### Acute-dento-alveolar infection

The initial assessment of an acute dento-alveolar infection is important. Hospital referral, rather than treatment is necessary if: there are indications of septicaemia, spreading cellulitis, swellings involving the floor of the mouth that may compromise the airway, difficulty in swallowing, dehydration, failure to respond to treatment. Antibiotics are an adjunct to the treatment of acute dento-alveolar infections. Patients should be reviewed after two to three days. Discontinue antibiotic if temperature normal and swelling resolving. Failure of resolution may require referral for specialist advice.

Amoxicillin	500mg TDS	Up to 5 days - review at 3 days
OR Penicillin V	500mg QDS	
OR Clarithromycin if penicillin allergic	500mg BD	
ADD Metronidazole if a predominately anaerobic infection is suspected	400mg TDS	3 days

### Acute necrotising ulcerative gingivitis

Swollen ulcerated gums, pain on chewing and swallowing +/- pyrexia usually with foul smelling breath. Active treatment including debridement needs to be delayed until the acute phase has passed. Refer to GDP/emergency dentist for advice on debridement and irrigation and oral hygiene.

Metronidazole	400mg TDS	3 days
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### Acute pericoronitis

- Pain and swelling localized to the partially erupted third molar teeth, most commonly lower teeth but can affect upper third molars as well.
- Refer to GDP/emergency dentist as debridement, irrigation or relief of occlusion may be needed.
- Chlorhexidine 0.2% mouthwash 300ml is useful as a local measure.

Metronidazole if there is pyrexia or gross local soft tissue swelling or trismus present	400mg TDS	3 days
OR Amoxicillin	500mg TDS	

1<sup>st</sup> line = Green | 2<sup>nd</sup> line = blue

\*Fluoroquinolones –Consider Drug Safety Risk

<b>Useful resources</b>
<b>TARGET RTI leaflet</b>
<a href="http://www.rcgp.org.uk/clinical-and-research/resources/toolkits/-/media/9ACFD17AEAD84E32BD8EBB3DC042C543.ashx">http://www.rcgp.org.uk/clinical-and-research/resources/toolkits/-/media/9ACFD17AEAD84E32BD8EBB3DC042C543.ashx</a>
<b>EMIS upload instructions (RTI)</b>
<a href="http://www.rcgp.org.uk/clinical-and-research/resources/toolkits/-/media/94BF700D782943739AEC58005455392F.ashx">http://www.rcgp.org.uk/clinical-and-research/resources/toolkits/-/media/94BF700D782943739AEC58005455392F.ashx</a>
<b>SystemOne upload instructions (RTI)</b>
<a href="http://www.rcgp.org.uk/clinical-and-research/resources/toolkits/-/media/43808FFCA83D4179AFB509E7362543DC.ashx">http://www.rcgp.org.uk/clinical-and-research/resources/toolkits/-/media/43808FFCA83D4179AFB509E7362543DC.ashx</a>
<b>TARGET UTI leaflet</b>
<a href="http://www.rcgp.org.uk/clinical-and-research/resources/toolkits/-/media/85AAD1D4DDEF455A85E0416C3BB714AE.ashx">www.rcgp.org.uk/clinical-and-research/resources/toolkits/-/media/85AAD1D4DDEF455A85E0416C3BB714AE.ashx</a>
<b>SystemOne upload instructions (UTI)</b>
<a href="http://www.rcgp.org.uk/clinical-and-research/resources/toolkits/-/media/0BA9C1807DE043969F06C45B41805CE7.ashx">http://www.rcgp.org.uk/clinical-and-research/resources/toolkits/-/media/0BA9C1807DE043969F06C45B41805CE7.ashx</a>
<b>NICE-PHE Summary of antimicrobial prescribing guidance – managing common infections</b>
<a href="https://www.nice.org.uk/Media/Default/About/what-we-do/NICE-guidance/antimicrobial%20guidance/summary-antimicrobial-prescribing-guidance.pdf">https://www.nice.org.uk/Media/Default/About/what-we-do/NICE-guidance/antimicrobial%20guidance/summary-antimicrobial-prescribing-guidance.pdf</a>

These guidelines have been produced by NHS Kernow’s Prescribing team in collaboration with Royal Cornwall Hospital Trust. The guidelines replace previous Management of infection guidelines for primary and community services (updated April 2019). Email: [kccg.prescribing@nhs.net](mailto:kccg.prescribing@nhs.net)

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1<sup>st</sup> line = Green | 2<sup>nd</sup> line = blue  
\*Fluoroquinolones –Consider Drug Safety Risk