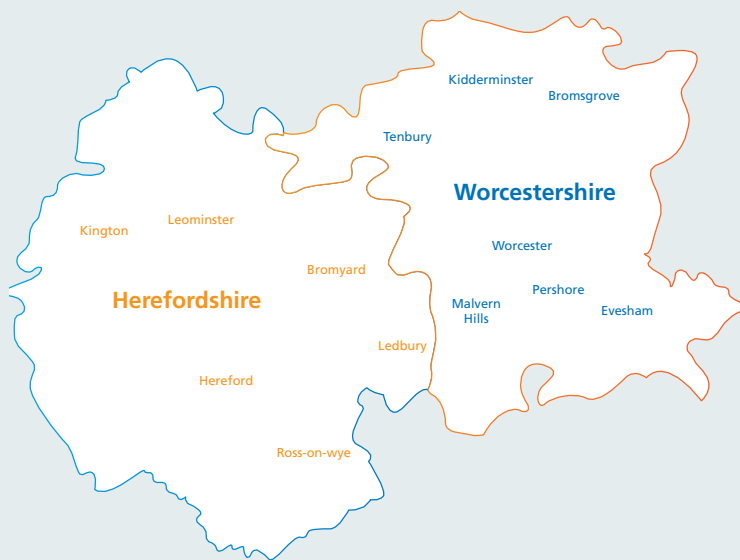


Herefordshire and Worcestershire Guidelines for Primary Care Antimicrobial Prescribing



Always consider if antibiotic treatment is necessary

Prescribing antibiotics for viral or mild self-limiting infections such as coughs and colds is unlikely to improve the course of the illness, puts patients at risk of side effects and encourages further consultations. Antibiotics should be targeted at those patients who are most likely to benefit.

[The NHS website](#) contains many patient information leaflets that support appropriate use of antibiotics. The Department of Health [website](#) gives details of the Public Health campaign and available leaflets.

Disclaimer:

Whilst every effort has been made to ensure the accuracy of this document, the steering group or any associated NHS Trusts cannot accept responsibility for any errors or omissions in the text. The text is not intended to be totally comprehensive, and the reader should be cognisant of any appropriate drug dosing, cautions, contraindications, interactions, adverse effects etc. for antibiotics, as indicated in texts such as the BNF and Summaries of Product Characteristics (SPCs). The clinician is still required to exercise clinical judgement.

Introduction

Welcome to the first edition of the H&W Antimicrobial Prescribing Guidelines for Primary Care. This document was adapted for local use using Public Health England's primary care guidelines as a template.

The review group consists of representatives from key parties and our aim, as always, is to guide colleagues working in primary care to the best treatment for the patient in front of them. We have tried to provide a balanced approach that takes into account likely pathogens, local sensitivity data, best prescribing practice, evidence-based medicine and cost-effectiveness. We realise that different people want different things from their guidelines. Some like having a summary of the evidence presented to them, replete with numbers needed to treat and numbers needed to harm to help guide decision making. Others just want to know what to give with the least possible fuss during a busy working day. We hope that the guideline format will keep both groups happy. Comments and challenge are welcomed.

We include guidance of the management of many common infectious problems likely to be encountered by GPs. Most sections consist of two parts:

- The first section is a quick reference guide to 1st and 2nd antimicrobial choices where appropriate, together with a few help notes.

[1st line = preferred drug, 2nd line = drug choice if 1st line is ineffective or inappropriate]

- The second section gives further details and clinical information to aid in making management decisions.

We hope that this guide will promote best practice across Herefordshire and Worcestershire.

On the behalf of the guideline review group

Antimicrobial Stewardship

Optimising Prescribing in Primary Care

It is recognised that GP consultations can often be challenging, particularly when patients expect to receive antibiotics and are unwilling to accept that they do not need them.

Evidence suggests that patients given antibiotics for commonly self-limiting infections, such as sore throats, are more likely to re-attend in the future to request antibiotics. Time spent carefully counselling such patients may reduce future demand on GP and practice nurse appointments.

There are a number of different prescribing decision aid tools currently available to guide clinicians on prudent prescribing of antimicrobials to reduce risks associated with inappropriate prescribing and thus also promote both cost and clinical effectiveness. Some of these guidance tools are applicable to primary care settings: **TARGET** and **NICHE**.

TARGET

The 'Treat Antibiotics Responsibly, Guidance and Education Tool' (TARGET) resources were first developed by the Antimicrobial Stewardship in Primary Care (ASPIC) established in 2009; a collaboration of several professional bodies, including the Royal College of General Practitioners (RCGP). The resource aims to support GPs to promote antimicrobial stewardship.

The toolkit provides training resources, patient information leaflets and audit tools to promote optimal antimicrobial prescribing. Patient information leaflets help explain the rationale for not prescribing antibiotics where the disease is viral in origin and/or self-limiting.

[The TARGET antibiotic toolkit can be found on the clinical and research pages of the RCGP website](#)

NICHE

As part of its activities to support European Antibiotic Awareness Day on 18 November, BSAC (British Society for Antimicrobial Chemotherapy) launched its NICHE campaign – offering all prescribers 5 moments to make a difference and prevent antibiotic resistance. NICHE is an electronic poster campaign with its acronym inviting prescribers to consider the following: **Need** (for antibiotic), **Investigation** (cultures for prescribing), **Choice** (spectrum of antibiotic), **How Long** (is your prescription for) and **Evaluate** (your patient and prescription). Posters are available in pop art, info graphic and diagrammatic formats, with the info graphic version available for both hospital and community settings. Healthcare professionals are encouraged to download and display locally, helping ensure the messages of European Antibiotic Awareness Day reach as many individuals as possible.

Reference: <http://bsac.org.uk/news/bsac-launch-of-niche-antibiotic-prescribing-campaign/>

General Guidance Notes When Prescribing Antibiotics

Signs/Symptoms of infection

Does the patient have any clinical signs/symptoms of infection?

Samples

Have appropriate samples been sent off for and taken for culture and sensitivity testing, if possible?

Microbiology

Does the patient have any relevant previous microbiology results which may impact on the antimicrobial choice?

Is there a history of Methicillin-Resistant *Staphylococcus Aureus* (MRSA), Extended Spectrum Beta-Lactamase (ESBL)-producing coliforms, Carbapenemase Producing *Enterobacteriaceae* (CPE) or *Clostridium difficile*?

Allergy

Does the patient have any relevant previous history of allergy to penicillins; if so what is the nature of the allergy? – Refer to page 5 of guideline for further detail on allergies and adverse drug reactions to antibiotics.

Is referral needed?

Does the patient require further referral? All patients presenting with pelvic inflammatory disease or epididymo-orchitis (with a proven sexually transmitted disease) should be referred to the Sexual Health Clinic as they may require further treatment with intramuscular (IM) ceftriaxone 1g STAT (if gonorrhoea is detected; the IM injection is not administered by GPs). Refer to the relevant section of the guideline for further detail.

Timing of the prescription

Timing of the prescription – can it be delayed? For all acute and self-limiting lower respiratory tract infections the prescription should be delayed, and the patient advised to 'self-treat': refer to individual section of the guideline for further advice on 'no' or 'delayed/back up' prescription strategy.

Telephone prescribing

Please limit prescribing over the telephone to exceptional cases.

Dose

Is the prescribed dose of the antibiotic correct according to the patient's renal or hepatic function?

Antibiotic durations

Information on antibiotic durations has been given in this guidance document where possible.

Adverse Drug Reactions

Always take a detailed history of any reported allergy to antibiotics so that patients with a true allergy can be identified. The type of reaction should be documented as this has implications for antibiotic choices. Many patients who report that they are allergic only experienced minor symptoms such as gastrointestinal (GI) disturbance. Restricting the choice of antibiotic on the basis of an inaccurate allergy history may result in the patient receiving sub-optimal treatment.

Penicillin allergy

Nausea, vomiting or diarrhoea do not, by themselves, constitute an allergic reaction. They are **NOT** a contraindication to penicillin use.

Anaphylaxis/Angioedema to penicillin

An anaphylactic reaction related to histamine release occurs 30-60 minutes after previous administration of a penicillin; symptoms may include erythema or pruritis, angioedema, hypotension, shock, urticaria, wheezing and rhinitis.

An accelerated allergic reaction occurs 1-72 hours after previous administration of a penicillin: symptoms may include erythema or pruritis, angioedema, urticaria, wheezing, and rhinitis (particular caution if symptoms include laryngeal oedema).

Unknown/uncorroborated history of penicillin allergy

For patients who are unable to give a clear history of penicillin allergy history/reaction, please try, where possible, to gain collateral history from relatives or GP records; including antibiotic use history.

Contraindications and Interactions

When prescribing antibiotics, consideration must be given to potential contraindications and drug interactions; refer to the current edition of the BNF or the drug's Summary of Product Characteristics (available at www.medicines.org.uk). Drug Safety Updates are also available at: <https://www.gov.uk/drug-safety-update>. Remember female patients may be receiving **oral contraceptives** from another prescriber. Also, always consider if a premenopausal woman may be pregnant when prescribing.

Pregnancy

Take specimens to inform treatment. Penicillins and cephalosporins are safe in pregnancy. Short-term use of nitrofurantoin is not expected to cause foetal problems (theoretical risk of neonatal haemolysis when given near term). Trimethoprim is a folate antagonist and there is a teratogenic risk in the first trimester of pregnancy; manufacturers advise avoid during pregnancy. Trimethoprim is not recommended in pregnancy if efficacious alternatives exist. However, prescribers are reminded that UTI / asymptomatic bacteriuria in pregnancy is a significant condition that also carries risks and if no other effective therapy exists, trimethoprim (off-label) should be considered. Trimethoprim after the first trimester is unlikely to cause harm. If prescribed in the first trimester, trimethoprim should be given with folic acid 5mg daily.

Avoid tetracyclines, aminoglycosides, quinolones, azithromycin, clarithromycin, and high dose metronidazole (i.e. 2g STAT), unless the benefit outweighs the risks and after a full discussion of the options with the patient. Erythromycin is the preferred macrolide in pregnancy; other macrolides have been associated with an increased risk of miscarriage.

***Clostridium difficile* risk**

Patients who have had repeated and/or prolonged antibiotic courses and have had a recent hospital admission are at increased risk of developing *Clostridium difficile* infection.

Particularly high-risk groups including:

- Elderly
- Renal, Oncology and Haematology patients
- Patients with Inflammatory Bowel Disease (IBD)
- Those on Proton Pump Inhibitors (PPIs)
- Prior treatment with co-amoxiclav, ciprofloxacin, cephalosporins or clindamycin.

If the patient is at risk of *Clostridium difficile* infection, please use narrow-spectrum agents where possible and avoid co-amoxiclav, ciprofloxacin, cephalosporins and clindamycin unless indicated by specific organism/sensitivity results.

Where it is not possible to avoid the above 'high-risk' agents, prescribe as short a course as possible.

Which guideline?

Antibiotic guidance in Herefordshire and Worcestershire is split based on primary and secondary care; staff working within each of these settings should refer to their respective guidance to inform prescribing. For staff within A&E or MIU settings, clinical judgement must be used to inform choice of agent based on clinical presentation and history.

Sepsis

<https://sepsistrust.org/>

Sepsis is a medical emergency. It is responsible for 52,000 deaths annually in the United Kingdom and severe sepsis has a five-fold higher mortality than ST-elevation myocardial infarction or stroke. The reliable recognition of sepsis is the responsibility of all health professionals. The campaign in secondary care has increased awareness and helped to structure the management of sepsis once the patient reaches hospital. However, it is essential that sepsis is recognised early for the patient to reach hospital soon enough to avoid serious complication or death. There are significant challenges and barriers to reliable sepsis identification in a primary care setting.

Sepsis is a complex condition and its presentation variable. GPs will be experienced in assessing need for hospital assessment in patients with probable self-limiting infection: it is not practicable to expect differentiation between uncomplicated viral and bacterial illness in all cases. Patients who are obviously critically ill are likely to be identified without the need for new efforts.

Sepsis (Cont.)

However, there are some patients with severe sepsis with less immediately obvious signs of critical illness. Some of this group might be identified earlier with greater awareness and targeted clinical assessment.

In light of this the UK Sepsis Trust have developed a clinical tool kit in partnership with the RCGP to facilitate the reliable identification and management of sepsis in the primary care setting. The toolkit is compatible with international guidelines on sepsis management, with the Department of Health's document 'Start Smart - then Focus', and with guidance on infection management in primary care issued by Public Health England.

General Practice Sepsis Screening and Action Tools are available for reference:

<https://sepsistrust.org/professional-resources/clinical/>

Renal impairment

For most patients and most medicines, estimated Glomerular Filtration Rate (eGFR) is an appropriate measure of renal function for determining dosage adjustments in renal impairment; however, in some circumstances, the [Cockcroft-Gault formula](#) should be used to calculate creatinine clearance (CrCl). ([MHRA Drug Safety Update](#))

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Review date:

July 2020. [Ratified by the Herefordshire & Worcestershire Medicines and Prescribing Committee (MPC)] Electronic updates will be issued as required.

Expiry date:

July 2023 or sooner if a new drugs application for a non-formulary medicine/indication is submitted to the Herefordshire & Worcestershire MPC or national guidance is updated.

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CHAPTER 1: EAR NOSE AND THROAT INFECTIONS

Drug	Adult Dose	Duration	Help Notes
Acute Otitis Media (AOM)			
<ul style="list-style-type: none"> Ensure adequate analgesia is advised. 60% of cases resolve <u>without</u> antibiotic treatment within 24 hours. 			<p>Pharmaco-vigilance when prescribing antibiotics for this indication.</p> <p>Treatment</p> <ol style="list-style-type: none"> In childhood, consideration should be given to whether antibiotic treatment is relevant. It may be appropriate to reserve treatment for high risk groups; e.g. children under 2 years AND bilateral AOM or bulging membranes and 4 or more marked symptoms; all ages with otorrhoea. Consider delaying prescription for 2 days to see if the condition resolves on its own with symptomatic advice/leaflet. If practices do not have such a leaflet RCGP offers a helpful resource. Pregnancy: erythromycin is preferred over clarithromycin (see page 5). Patients not allergic to penicillin who have failed therapy with amoxicillin or where susceptibilities indicate (e.g. B-lactamase positive <i>Haemophilus</i> cultured from ear swabs): co-amoxiclav should be prescribed. <p>Referral</p> <ol style="list-style-type: none"> Consider ENT referral for recurrent episodes.
<p>First line: Amoxicillin</p>	500mg TDS	For 5 days	
<p>Penicillin allergy: Clarithromycin</p> <p><i>(Pregnant women: refer to help note c)</i></p>	250mg to 500mg BD	For 5 days	
<p>Always check the Children's BNF for calculation of doses in children.</p> <p>See here for patient information leaflets.</p>			

Additional Notes:
Otitis Media

Common Pathogens:

- Viruses
- S. pneumoniae*
- H. influenzae*
- Group A Streptococci
- M. catarrhalis*

Clinical Details:

- Current debate lies in whether to prescribe antibiotics at all. Public Health England guidelines suggest that antibiotics should be avoided as 60% of cases are better in 24 hours without: pain is reduced compared to controls after 2 days of therapy (see [NICE CKS](#)) and do not prevent deafness.
- Feared complications are rare; e.g. mastoiditis, meningitis. (NNT to prevent mastoiditis >4000).

- Reduction in frequency of prescribing of antibiotics may help limit the increasing antibiotic resistance among bacteria implicated in this type of infection.
- A strategy of watchful waiting and use of delayed prescriptions may be appropriate for many children. Paracetamol and ibuprofen can be used for symptomatic relief of pain and fever.
- If antibiotics are prescribed, a five day course is probably adequate.

Drug	Adult Dose	Duration	Help Notes
Acute Otitis Externa (AOE)			
<ul style="list-style-type: none"> Ensure adequate analgesia is advised. Cleansing the area and aural toilet is important and a useful alternative to antibiotic therapy. Advise patients to keep the ear canal clean and dry and free of sloughy material, due to the risk of secondary fungal infection. <i>In severe/difficult to manage cases refer to help note e.</i> 			<p>Investigation/Treatment</p> <ol style="list-style-type: none"> For mild symptoms (mild discomfort and/or pruritus; no deafness or discharge), use acetic acid 2% solution (EarCalm®), which can be purchased OTC from community pharmacies (licensed in 12 years and above). Acetic acid (EarCalm®) has been used in some studies – lowering the pH inhibiting <i>Pseudomonas spp.</i> growth and colonisation. Swabs of ear discharge may guide treatment. Oral antibiotics are indicated if the patient is systemically unwell or there is evidence of spreading infection. If condition recurrent, aural toilet may be provided by local nurse practitioner. Consider underlying disease such as diabetes or exfoliative skin conditions. If severe (cellulitis or disease extending outside ear canal) or recurrent episodes, start antibiotics and refer to ENT. Pregnancy: erythromycin is preferred over clarithromycin (see page 5). <p>Additional Drug Information</p> <ol style="list-style-type: none"> Topical treatment is usually effective - choice guided by infection treated and manufacturer availability. If the eardrum is perforated, the use of drops containing aminoglycosides is contra-indicated (CSM advice, see BNF). Consider adverse effects of topical treatment, such as fungal superinfection, particularly with long-term use. (NICE CKS) <p>Referral</p> <ol style="list-style-type: none"> Fungal infections are difficult to treat and may require specialist referral. See help note f. <p>Reference</p> <ol style="list-style-type: none"> A patient information leaflet can be found here.
<p>Topical first line: Acetic acid 2% (EarCalm® spray) OR <i>If Pseudomonas growth in ear swab sample (refer to help notes a to c)</i></p> <p><i>Available to buy OTC (refer to help note a)</i></p>	1 spray TDS	For 7 days	
<p>Betamethasone-neomycin sulphate OR</p> <p><i>(Refer to help notes h to j)</i></p>	2-3 drops TDS/ QDS	For 7 days min to 14 days max	
<p>Otomize® ear spray (acetic acid-dexamethasone-neomycin sulfate) OR</p> <p><i>(Refer to help notes h to j)</i></p>	1 spray TDS	For 7 days min to 14 days max	
<p>Sofradex® ear drops (dexamethasone-framycetin sulphate-gramicidin)</p> <p><i>(Refer to help notes h to j)</i></p>	2-3 drops QDS	For 7 days min to 14 days max	
<p>Oral first line: Flucloxacillin</p> <p><i>(Refer to help note d)</i></p>	500mg QDS	For 7 days	

Drug	Adult Dose	Duration	Help Notes
Acute Otitis Externa (Cont.)			
Oral second line or penicillin allergy: Clarithromycin <i>(Pregnant women: refer to help note g)</i>	500mg BD	For 7 days	
Fungal: Clotrimazole 1% solution	3 drops TDS	Continue for at least 14 days after disappearance of infection	
Always check the Children's BNF for calculation of doses in children.			

Additional Notes: Otitis Externa

1. Corticosteroid/antibiotic drops are of secondary importance, and if used in isolation for long periods, encourage bacterial resistance, otomycosis and local skin reactions.
2. Corticosteroid drops are of benefit in the prodromal phase of **eczematous otitis externa**.
3. **Furuncles**, and other localised lesions, are best treated by the insertion of a soothing wick, and if symptoms are severe use systemic antibiotics active against *Staphylococci*. Referral to ENT should be considered.
4. Failure to respond to aural toilet may indicate inadequate treatment, or a localised reaction. If infection progresses to involve soft tissues, perichondrium or bone, then hospital admission for intravenous antibiotics, and further aural toilet may be required.
5. The isolation of *C. albicans* or *Pseudomonas spp.* usually indicates colonisation after antibiotic therapy but will occasionally require specific antimicrobial therapy.
6. **Malignant otitis externa**, caused by *P. aeruginosa* is a serious invasive condition, requiring aggressive intravenous antibiotic therapy and often surgical debridement. It is most common in diabetics.
7. **Recurrent otitis externa** - consider underlying disease such as diabetes mellitus or exfoliative skin conditions.

Drug	Adult Dose	Duration	Help Notes
Dental Infections: Acute Dental Abscess			
<ul style="list-style-type: none"> Regular analgesia (refer to help note a). Antibiotics are ONLY recommended if there are signs of severe infection, systemic symptoms or high risk of complications. 			<ul style="list-style-type: none"> a. Regular analgesia should be the first option until a dentist can be seen for urgent drainage, as repeated courses of antibiotics for an abscess are not appropriate. Repeated antibiotics alone, without drainage are ineffective in preventing spread of infection. b. Severe odontogenic infections; defined as cellulitis plus signs of sepsis, difficulty in swallowing, impending airway obstruction, and Ludwigs angina. Refer urgently for admission to protect airway, achieve surgical drainage and IV antibiotics. c. The empirical use of cephalosporins, co-amoxiclav, clarithromycin, and clindamycin do not offer any advantage for most dental patients and should only be used if there is no response to first-line drugs. d. If pus is present; refer for drainage, tooth extraction or root canal. Send pus to microbiology. e. For true penicillin allergy, use clarithromycin or clindamycin if severe. f. If spreading infection (lymph node involvement, or systemic signs i.e. fever or malaise) ADD metronidazole. g. Pregnancy: erythromycin is preferred over clarithromycin (see page 5).
Amoxicillin	500mg to 1000mg TDS	Up to 5 days	
If spreading infection (refer to help note f): Metronidazole	400mg TDS	Up to 5 days	
Penicillin allergy: Clarithromycin (Pregnant women: refer to help note g)	500mg BD	Up to 5 days	
Dental Infections: Gingivitis			
Simple Gingivitis (mucosal ulceration and inflammation)			
Simple Saline Mouthwash	½ teaspoon of salt dissolved in a glass of warm water	Always spit out after use. Use until lesions resolve or less pain allows oral hygiene.	<ul style="list-style-type: none"> a. Mouthwash products may be purchased OTC from community pharmacies. b. Temporary pain and swelling relief can be attained with saline mouthwash. c. Use antiseptic mouthwash: if more severe and pain limits oral hygiene, to prevent or treat secondary infection. d. The primary cause for mucosal ulceration or inflammation (aphthous ulcers, oral lichen planus, herpes simplex infection and oral cancer) needs to be evaluated and treated.
Chlorhexidine mouthwash 0.12-0.2% (Do not use within 30 minutes of toothpaste) Available to buy OTC (refer to help note a)	Rinse mouth for 1 minute BD with 10ml In cases where oral desquamation occurs dilution of the mouthwash with an equal volume of tap water, freshly mixed, will often allow continued use of the mouthwash.		

Drug	Adult Dose	Duration	Help Notes
Simple Gingivitis (mucosal ulceration and inflammation) (Cont.)			
Hydrogen peroxide 6% <i>Available to buy OTC (refer to help note a)</i>	2 to 3 minutes BD/TDS with 15ml in ½ glass of warm water	Always spit out after use. Use until lesions resolve or less pain allows oral hygiene.	
Acute Necrotising Ulcerative Gingivitis			
Metronidazole	400mg TDS	For 3 days	a. Commence metronidazole and refer to dentist for scaling and oral hygiene advice. b. Use in combination with antiseptic mouthwash if pain limits oral hygiene.
If pain limits oral hygiene add: Chlorhexidine mouthwash 0.12-0.2% OR (Do not use within 30 minutes of toothpaste)	Rinse mouth for 1 minute BD with 10ml	Always spit out after use. Use until lesions resolve or less pain allows oral hygiene.	
Hydrogen peroxide 6%	2 to 3 minutes BD/TDS with 15ml in ½ glass of warm water		
Dental Infections: Pericoronitis			
Metronidazole OR	400mg TDS	For 3 days	a. Refer to dentist for irrigation and debridement. b. If persistent swelling or systemic symptoms use metronidazole. c. Use antiseptic mouthwash if pain and trismus limit oral hygiene.
Amoxicillin	500mg TDS	For 3 days	
Use antiseptic mouthwash if pain and trismus limit oral hygiene: Chlorhexidine mouthwash 0.12-0.2% OR (Do not use within 30 minutes of toothpaste)	Rinse mouth for 1 minute BD with 10ml	Always spit out after use. Use until lesions resolve or less pain allows oral hygiene.	
Hydrogen peroxide 6%	2 to 3 minutes BD/TDS with 15ml in ½ glass of warm water	Always spit out after use. Use until lesions resolve or less pain allows oral hygiene.	

Drug	Adult Dose	Duration	Help Notes
Oral Candidiasis			
First line (topical treatment): Miconazole 20 mg/g oral gel MHRA Drug Safety Update: potential for serious interaction with warfarin <i>Advise to buy OTC (refer to help note a)</i>	Apply 2.5 mL QDS after meals. The gel should not be swallowed immediately, but kept in the mouth as long as possible.	For 7 days; continue for 7 days after resolved	<p>a. Self-care: Oral Thrush is common in babies and older people with dentures or those using corticosteroid inhalers. Advise patients/parents to purchase OTC gel from community pharmacies (licensed for sale 4 months and over); in line with national recommendations NHSE Conditions for which over the counter items should not routinely be prescribed in primary care.</p> <p>b. Inhaled corticosteroid users should be given oral hygiene advice and encouraged to use a spacer (when appropriate to the device).</p> <p>c. Oral candidiasis is a common opportunistic infection, caused by the overgrowth of <i>Candida spp.</i>, most commonly <i>C. albicans</i>.</p> <p>d. Predisposing factors include antibiotic or cytotoxic drug therapy, dentures, smoking, diabetes mellitus, high carbohydrate diet, malignancies and immunosuppressive conditions (including HIV), oral and inhaled corticosteroids.</p> <p>e. Oral candidiasis is unusual in immunocompetent individuals without clear predisposing factors; e.g. recent antibiotics or corticosteroid treatment.</p> <p>f. In neonates, miconazole oral gel may be preferential (off-label use).</p> <p>g. Data extrapolated from a trial in infants and immunosuppressed people suggests nystatin is not as effective as topical miconazole and therefore not proposed as first line treatment.</p> <p>h. The management of individual patients will depend on the underlying predisposing condition. Symptoms may resolve simply on withdrawal of antibiotic or cytotoxic therapy. Prophylactic antifungal treatment may be necessary in some groups of patients.</p> <p>i. For patients on current cytotoxic therapy, seek advice from oncology team.</p> <p>j. Immunocompetent children should only receive topical treatment.</p>
Second line: Nystatin suspension 100,000 units/ml	1ml QDS <i>(Sufficient suspension is required to coat the entirety of the mouth as nystatin is only effective when it is in physical contact.)</i>	For 7 days; continue for 2 days after resolved	
Extensive or severe infection (systemic treatment): Fluconazole	50mg OD	For 7-14 days	
Always check the Children's BNF for calculation of doses in children.			

Drug	Adult Dose	Duration	Help Notes
Pharyngitis			
First line: Phenoxymethylpenicillin OR <i>(Refer to help note h)</i>	500mg QDS	For 10 days	Investigation/Treatment a. Remember that c. 75% of sore throats are viral and do <u>not</u> require antibiotic treatment. b. Consider giving 'a delayed prescription '; i.e. 'if you are no better in 48 hours, <u>then</u> take your antibiotic'. Also, consider providing a symptomatic advice/leaflet. If practices do not have such a leaflet RCGP offers a helpful resource. c. Consider a throat swab prior to treatment for recurrent infections. d. For severe infections , consider phenoxymethylpenicillin 1g QDS for 10 days. e. For recurrent infections , more prolonged and aggressive therapy may be required. f. Pregnancy: erythromycin is preferred over clarithromycin (see page 5). Differential Diagnosis g. Consider diphtheria , if travel history is appropriate. h. Where there is strong clinical suspicion of glandular fever as part of the differential diagnosis, do not prescribe amoxicillin for the patient. If antibiotics are indicated for possible concurrent or suspected bacterial pharyngitis, where glandular fever is also suspected, phenoxymethylpenicillin (Penicillin V) should be the agent of choice.
Amoxicillin <i>(Refer to help note h)</i>	500mg TDS	For 10 days	
Second line <u>or</u> penicillin allergy: Clarithromycin <i>(Pregnant women: refer to help note f)</i>	250mg to 500mg BD	For 5 days	
Always check the Children's BNF for calculation of doses in children. Amoxicillin may be used instead of penicillin for children because of better taste, absorption and tolerability.			

Additional Notes: Pharyngitis**Common Pathogens:**

Viruses

Less commonly:

S. pyogenes
(group A Streptococcus)

H. influenzae
(under 5's)

Precautions:

Avoid amoxicillin or ampicillin if there is a possibility of glandular fever, since the combination nearly always produces a rash. Clarithromycin (or erythromycin if pregnant) is a suitable alternative.

Clinical Details:

1. Approximately 90% of cases resolve in 7 days without antibiotics and pain is only reduced by a median of 16 hours. Consider giving only advice and/or advice sheet and/or a delayed prescription to be dispensed only if the condition does not improve in 2 - 3 days along with analgesics for symptom relief.
2. If Centor score 3 or 4: (lymphadenopathy; no cough; fever; tonsillar exudate) consider 2 or 3 days delayed or immediate antibiotics. The presence of 3 or 4 of these clinical signs suggests the chance of having Group A Streptococcus is between 40% and 60%, so patient may benefit from an antibiotic.
3. Only c. 25% of throat infections are bacterial in origin. This may be up to 50% in the 4-13 year age group. Streptococcal throat infections are less common in infants; other organisms in infants include *Haemophilus*, for which amoxicillin is appropriate first-line therapy.
4. Viral and bacterial throat infections are indistinguishable except for scarlet fever (causative organism - *S. pyogenes*). However, both are usually self-limiting. There is some evidence that recurrence and relapse may be more common in those who have had early treatment with antibiotics and patients are more likely to return to their GP.
5. Severe pharyngitis; pronounced systemic features and scarlet fever have been suggested as diagnostic features to prompt antibiotic treatment.
6. Complications such as abscess (quinsy), rheumatic fever and kidney problems are rare, and outcomes are not affected by a short delay in treatment.
7. Penicillin is the drug of choice for treating *S. pyogenes* infection, but children may prefer the taste of amoxicillin oral suspension.

Drug	Adult Dose	Duration	Help Notes
Acute Sinusitis			
<ul style="list-style-type: none"> Ensure adequate analgesia is advised. Symptoms may persist for 2-3 weeks regardless of antibiotics. 			<ul style="list-style-type: none"> a. Many cases will be viral, therefore will not require antibiotics. b. Antibiotics should be used when there is systemic illness, or severe symptoms that last longer than 10 days. c. If severe infection, consider increasing amoxicillin dose to 1g TDS for 7 days (off-licence use). d. Purulent nasal discharge; consider 7 day delayed or immediate antibiotic. e. For persistent infection (frequently relapsing) sinusitis, consider referral, and/or consider co-amoxiclav 625mg for 7 days. f. Doxycycline should be avoided in pregnancy. g. Pregnancy: erythromycin is preferred over clarithromycin (see page 5). h. Reference: if practice does not have a symptomatic advice/leaflet available RCGP offers a helpful resource.
First line: Amoxicillin	500mg TDS	For 5 days	
Second line or penicillin allergy: Doxycycline OR <i>(Pregnant women: refer to help note f)</i>	200mg STAT, then 100mg OD	For 5 days	
Clarithromycin <i>(Pregnant women: refer to help note g)</i>	500mg BD	For 5 days	
Severe infection or at high risk of complications			
Co-amoxiclav	625mg TDS	For 7 days	See above help notes.

CHAPTER 2: EYE

Drug	Adult Dose	Duration	Help Notes
Bacterial Conjunctivitis			
Chloramphenicol 0.5% eye drops <i>Advise to buy OTC (refer to help note c)</i>	2 hourly for 2 days, then 4 hourly (whilst awake). OR	For 48 hours after resolution	Investigation a. Always take a swab specimen (using appropriate swab) from neonates up to 4 weeks old. Remember that <i>Chlamydia</i> may be a causative organism. Self-care b. Many conjunctival infections are self-limiting (64% resolve on placebo by day five) and are of viral origin . c. Advise patients/parents to purchase OTC from community pharmacies (licensed for sale 2 years and over); in line with national recommendations NHSE Conditions for which over the counter items should not routinely be prescribed in primary care . Referral d. Urgent Referral: any apparent conjunctivitis associated with pain, reduced vision, corneal opacities and/or in contact lens wearers needs same day referral to ophthalmology to exclude keratitis. e. If <i>Chlamydia</i> is detected in a neonate , remember to treat the mother and undertake contact tracing. Refer to Sexual Health Clinic for further assessment.
Chloramphenicol 1% ointment <i>Advise to buy OTC (refer to help note c)</i>	Sole use: apply TDS-QDS or At night (if drops used during the day) .		
Chlamydia Eye Infection			
Systemic macrolide usually preferred but seek microbiological advice for details of drug choice and dose.			See above help notes.

CHAPTER 3: GENITO-URINARY AND GYNAECOLOGICAL INFECTIONS

Drug	Adult Dose	Duration	Help Notes
Bacterial Vaginosis			
First line: Metronidazole OR	400mg BD	For 7 days	<ul style="list-style-type: none"> a. History of vaginal discharge with odour (typically fishy) and raised pH of vaginal fluid very suggestive of infection. Diagnosis may be based on swab or if at low risk of STI, patients with relevant symptoms may be treated empirically without investigation. b. Oral metronidazole is as effective as topical treatment and more cost effective. c. There is less relapse with 7 days treatment than 2g STAT at 4 weeks. d. For bacterial vaginosis in pregnancy, avoid 2g dose, treat with oral metronidazole 400mg BD for 7 days as early as possible in the 2nd trimester. (There is no evidence of teratogenicity in humans when used at this dose). e. Group B strep is normal flora in the vagina and when isolated in a high vaginal swab (HVS) does not require treatment, however when isolated in pregnancy peri-partum antibiotics should be considered. Ensure patients are aware of risks and notes annotated accordingly, and appropriate advice leaflet given (see RCOG website). f. There is evidence suggesting that the use of acetic acid is effective for the treatment of bacterial vaginosis as well, although dosing schedules are not provided within the scope of this guideline.
Metronidazole	2 grams	Single dose	
<i>(Pregnant women: refer to help note d)</i>			
For those intolerant to metronidazole: Clindamycin 2% vaginal cream	One applicator full intravaginally at bedtime	For 7 consecutive days	
Trichomonas			
Metronidazole OR	400mg BD	For 7 days	<ul style="list-style-type: none"> a. See help notes above. b. <i>Trichomonas</i> is a sexually transmitted infection, consider contact tracing. Treat partners and refer to Sexual Health Clinic (contact details page 66). c. Consider HIV or syphilis testing in all cases of STI. d. In pregnancy/breastfeeding: avoid 2g STAT dose. Refer to Sexual Health Clinic (contact details page 66).
Metronidazole	2 grams	Single dose	
<i>(Refer to help note d)</i>			
Consider clotrimazole 100mg pessary at night for 6 nights for symptom relief (not cure) if metronidazole declined. Refer to Sexual Health Clinic (contact details page 66).			

Drug	Adult Dose	Duration	Help Notes
Chlamydia			
First line for uncomplicated urogenital, pharyngeal and rectal chlamydia infections: Doxycycline	100mg BD	For 7 days	<p>Investigation/Treatment</p> <ol style="list-style-type: none"> Relevant investigations: urine for dual chlamydia and gonorrhoea PCR in men and low vaginal or self-taken vaginal swab for <i>N. gonorrhoea</i> and <i>Chlamydia</i> PCR in women. Endocervical swab for gonorrhoea culture. Contact tracing and treatment is an important issue. STIs often co-exist with other infections. Patients should be advised to avoid sexual intercourse (including oral sex) until they and their partner(s) have completed treatment (or wait 7 days if treated with azithromycin). <p>Additional drug information</p> <p><u>Quinolones:</u></p> <ol style="list-style-type: none"> Risk of <i>C. difficile</i> disease with quinolones. Stop immediately if diarrhoea occurs. In patients at high risk of, or previous <i>C. difficile</i> disease use an alternative agent. Small increased risk of aortic aneurysm and dissection; advice for prescribing in high-risk patients (MHRA Drug Safety Update). Restrictions and precautions for use due to very rare reports of disabling and potentially long-lasting or irreversible side effects (MHRA Drug Safety Update).
First line for individuals who are allergic to, or intolerant of tetracyclines, and pregnant women: Azithromycin	1g orally as single dose followed by 500mg once daily for 2 days	For 3 days total treatment	
Alternative regimens (if either of the above treatment is contraindicated): Erythromycin OR	500mg BD	For 14 days	
Ofloxacin (Refer to help notes e to g)	200mg BD OR 400mg OD	For 7 days	
Genital Yeast Infections (treatment for <u>non-pregnant</u> patients)			
Topical clotrimazole HC cream BD may alleviate symptoms.			<ol style="list-style-type: none"> Oral and topical anti-fungal preparations may be purchased OTC in line with license from community pharmacies over 16 and under 60 years old. If the vulva is very inflamed topical treatment may be painful – use oral fluconazole. Avoid perfumed soap and shower gels. Recurrent vaginal infections may suggest possible underlying pathology e.g. diabetes. Take a swab to confirm diagnosis and assess antifungal susceptibility of any <i>Candida</i> isolated. See CKS guidance for further information on the management of vaginal discharge. Avoid antibiotic therapy where possible as it may precipitate candidiasis.
Fluconazole (oral) OR (Do NOT prescribe in patients possibly pregnant. Refer to page 23 for treatment of pregnant patients.) <i>Available to buy OTC (refer to help note a).</i>	150mg	Single dose	

Drug	Adult Dose	Duration	Help Notes
Genital Yeast Infections (treatment for non-pregnant patients) (Cont.)			
Clotrimazole pessary OR <i>Available to buy OTC (refer to help note a)</i>	500mg	Single application	e. In cases of infection caused by non- <i>albicans Candida</i> species and/or fluconazole-resistant yeasts, please discuss with Sexual Health Clinic or microbiology. f. For penile candidiasis use 1% clotrimazole topical cream (can be purchased OTC from community pharmacies). g. Clotrimazole pessaries and cream (but not HC version) and fluconazole capsules can be purchased OTC from community pharmacies.
Clotrimazole 10% vaginal cream <i>Available to buy OTC (refer to help note a)</i>	5 grams	Single application	
Genital Yeast Infections (treatment for pregnant patients)			
Clotrimazole pessary OR <i>(refer to help note a)</i>	100mg pessary at night	For 6 nights	a. During pregnancy the pessary should be inserted without using an applicator. b. For vulvitis miconazole 2% vaginal cream should be applied topically twice daily.
Miconazole 2% vaginal cream <i>(Refer to help note b)</i>	One applicator (about 5g of cream) once daily before bedtime intravaginally	For 7 days	
Genital Viral Infection: Primary Genital Herpes Simplex Virus (HSV)			
Discuss measures for pain relief: Oral analgesics and daily soaks/baths in saline solution. Depending on severity, an OTC topical analgesic (e.g. lidocaine 2%) may be advised.			a. Watch out for secondary bacterial infection. STIs commonly co-exist, AND therefore refer to the Sexual Health Clinic for new presentations. b. Syphilis testing should be offered in all patients with genital ulceration. c. Patients are advised to avoid sexual intercourse until lesions have healed. d. In all cases of HSV in pregnancy, seek advice for details of management from Sexual Health or Microbiology. e. In difficult cases seek Sexual Health Clinic advice. f. Explanations as regards to latency of infection should be offered with Sexual Health Clinic referral if further counselling required.
Aciclovir	400mg TDS	For 5 days	
<ul style="list-style-type: none"> Mild recurrences: Manage symptomatically Infrequent severe recurrences: Treat each occurrence with five days Aciclovir as above Frequent severe recurrences (more than six episodes a year): Aciclovir 400mg BD for 6-12 months (review 3 monthly) 			
			Sexual Health Clinic - contact details page 66.

Drug	Adult Dose	Duration	Help Notes
Gonorrhoea			
REFER ALL PATIENTS TO SEXUAL HEALTH CLINIC Refer to page 66 for contact details.			PLEASE NOTE: Department of Health CMO/CPO letter on antimicrobial resistance and Gonorrhoea.
Non-Gonococcal Urethritis (NGU)			
Doxycycline <i>(Pregnant women: refer to help note c)</i>	100mg BD	For 7 days	<p>a. PLEASE NOTE: Department of Health CMO/CPO letter on antimicrobial resistance and Gonorrhoea</p> <p>b. Treatment for recurrent infection should include cover for <i>M. genitalium</i> and <i>T. vaginalis</i>.</p> <p>c. For female contacts doxycycline and azithromycin should be avoided in pregnancy.</p> <p>d. Common risk factors for gonorrhoea: previous <i>N. gonorrhoeae</i> infection, known contact of gonorrhoea, presence of purulent urethral discharge and men who have sex with men.</p> <p>e. Refer high risk gonorrhoea patients and patients with gonorrhoea to the Sexual Health Clinic. Refer to page 66 contact details.</p>
Alternative regime: Azithromycin <i>(Pregnant women: refer to help note c)</i>	1g STAT, then 500mg once daily for the next 2 days	For 3 days total treatment	
For recurrent infection: <i>If treated with doxycycline regimen first line:</i> Azithromycin AND Metronidazole <i>(Pregnant women: refer to help note c)</i>	1g stat, then 500mg once daily for the next 2 days 400mg BD for 5 days	Azithromycin should be started within 2 weeks of finishing doxycycline. This is not necessary if the person has tested Mgen-negative.	
For recurrent infection: <i>If treated with Azithromycin regimen first line:</i> Doxycycline AND Metronidazole	100mg BD 400mg BD	For 7 days For 5 days	

Drug	Adult Dose	Duration	Help Notes
Pelvic Inflammatory Disease (PID)			
Ofloxacin AND Metronidazole (Refer to help notes g, and i to k) OR Ceftriaxone (IM) AND Doxycycline AND Metronidazole	400mg BD 400mg BD 1000mg 100mg BD 400mg BD	For 14 days For 14 days Stat For 14 days For 14 days	<p>Recommendations are in line with BASHH (January 2019)</p> <p>Investigation/Treatment</p> <ol style="list-style-type: none"> Always perform a pregnancy test. In pregnancy, seek specialist advice. In cases of suspected PID, always test for gonorrhoea and <i>Chlamydia</i>. If treatment failure in PID, reassess diagnosis and antibiotic compliance, consider referral to Gynaecology clinic. Consider admission if systemically unwell. Partners of index patients diagnosed with PID should be offered anti-<i>Chlamydia</i> treatment empirically. 28% of gonorrhoea isolates now resistant to quinolones. If gonorrhoea likely (partner has it, severe symptoms, sex abroad) refer to Sexual Health Clinic - avoid treatment with ofloxacin. Common risk factors for gonorrhoea: previous <i>N. gonorrhoeae</i> infection, known contact of gonorrhoea, presence of purulent urethral discharge and men who have sex with men. <p>Additional drug information</p> <p><u>Quinolones:</u></p> <ol style="list-style-type: none"> Risk of <i>C. difficile</i> disease with quinolones. Stop immediately if diarrhoea occurs. In patients at high risk of, or previous <i>C. difficile</i> disease use an alternative agent. Small increased risk of aortic aneurysm and dissection; advice for prescribing in high-risk patients (MHRA Drug Safety Update). Restrictions and precautions for use due to very rare reports of disabling and potentially long-lasting or irreversible side effects (MHRA Drug Safety Update). <p>Referral</p> <ol style="list-style-type: none"> Refer patients with a proven STI or at risk of an STI to the Sexual Health Clinic for further assessment. Refer to page 66 contact details.

CHAPTER 4: INTRA-ABDOMINAL INFECTIONS

Drug	Adult Dose	Duration	Help Notes
<i>Clostridium difficile</i> Associated Diarrhoea			
Mild/moderate cases 1st / 2nd episodes: Metronidazole (Do NOT delay treatment pending stool testing if strong suspicion – relapse is common if treatment stopped prematurely)	400mg TDS	If responding, continue for 14 days	<p>Most commonly follows antibiotic use and although often associated with hospital admission, may also follow antibiotic therapy in the community.</p> <p>Investigation/Treatment</p> <ol style="list-style-type: none"> Stop offending antibiotic where possible and /or PPI – this may be sufficient to relieve symptoms in mild cases. DO NOT USE anti-diarrhoeal agents (e.g. loperamide). Send stool specimen whenever <i>C. difficile</i> suspected (recent hospital admission, antibiotic use, blood/mucus in stools). Whenever possible, avoid antibiotics in patients known to have had <i>C. difficile</i> disease. Ask for microbiology advice if antibiotics are necessary. Avoid use of cephalosporins, quinolones and clindamycin. PPIs increase risk of <i>C. difficile</i>. Observe good infection control practice, particularly in community hospital and care home settings (refer to infection control policy). If patient requires hospital admission, inform admitting team if known or suspected to have <i>C. difficile</i> disease. Use of oral vancomycin does not routinely require therapeutic drug monitoring. <p>Referral</p> <ol style="list-style-type: none"> If at any point the patient deteriorates refer to microbiology or hospital immediately. Admit if severe: T>38.5; WCC >15, rising creatinine or signs/symptoms of severe colitis.
If no improvement with above regimen within 3-5 days change to: Vancomycin (oral)	125mg QDS	If responding, continue for 14 days	
3rd episode: Vancomycin (oral)	125mg QDS	For 14 days	
	If not responding within 3-5 days increase dose to 250mg QDS and complete 14 days on this increased dose.		
Further relapses: Vancomycin 250mg QDS for 14 days, then gradually reduce as a tapering course as below: 125mg QDS for 1 week, then 125mg TDS for 1 week, then 125mg BD for 1 week, then 125mg OD for 1 week, then 125mg alternate days for 2 weeks, then 125mg every 3rd day for 2 weeks.			

Drug	Adult Dose	Duration	Help Notes
Cholangitis / Mild Acute Cholecystitis suitable for treatment in primary care (see help notes a and b)			
First line: Co-amoxiclav	625mg TDS	For 5 days	Investigation/Treatment a. If at any point a patient deteriorates, then they should be referred immediately to hospital. b. Acute cholecystitis or cholangitis are potentially medical emergencies, and unwell patients should be urgently referred to the hospital for confirmation of diagnosis, monitoring, surgical assessment, intravenous fluids, antibiotics and analgesia. c. Patients who are not unwell or who have mild intermittent symptoms, may be considered for routine referral to hospital for out-patient assessment and further investigation. Whilst awaiting this referral, it may be appropriate to offer analgesia and oral antibiotics. d. The commonest organisms causing biliary infection within the UK are <i>Klebsiella spp.</i> , <i>E. coli</i> and streptococci (including enterococci). If antibiotic treatment is required, then appropriate choices are as stated. e. Ciprofloxacin should be avoided in pregnancy. Additional drug information Quinolones: f. Risk of <i>C. difficile</i> disease with quinolones. Stop immediately if diarrhoea occurs. In patients at high risk of, or previous <i>C. difficile</i> disease use an alternative agent. g. Small increased risk of aortic aneurysm and dissection; advice for prescribing in high-risk patients (MHRA Drug Safety Update). h. Restrictions and precautions for use due to very rare reports of disabling and potentially long-lasting or irreversible side effects (MHRA Drug Safety Update).
Second line <u>or</u> penicillin allergy: Ciprofloxacin <i>(Refer to help notes e to h)</i>	500mg BD	For 5 days	
Diverticulitis			
First line: Co-amoxiclav	625mg TDS	For 5 days	Investigation/Treatment a. Advise paracetamol for pain. Nonsteroidal anti-inflammatory drugs (NSAIDs) and opioid analgesics have been identified as risk factors for diverticular perforation.

Drug	Adult Dose	Duration	Help Notes
Diverticulitis (Cont.)			
<p>Second line or penicillin allergy: Ciprofloxacin</p> <p>AND</p> <p>Metronidazole</p> <p><i>(Refer to help notes d to h)</i></p>	<p>500mg BD</p> <p>400mg TDS</p>	<p>For 5 days</p>	<p>b. Recommend clear fluids only. Gradually reintroduce solid food as symptoms improve over 2-3 days.</p> <p>c. Always review patients within 48 hours or sooner if symptoms deteriorate. Arrange hospital admission if symptoms persist or deteriorate.</p> <p>d. Be aware of possible risk of C. difficile disease in patients taking antibiotics, particularly with the use of ciprofloxacin. Stop all antibiotics if diarrhoea develops.</p> <p>e. Ciprofloxacin should be avoided in pregnancy.</p> <p>Additional drug information <u>Quinolones:</u></p> <p>f. Risk of <i>C. difficile</i> disease with quinolones. Stop immediately if diarrhoea occurs. In patients at high risk of, or previous <i>C. difficile</i> disease use an alternative agent.</p> <p>g. Small increased risk of aortic aneurysm and dissection; advice for prescribing in high-risk patients (MHRA Drug Safety Update).</p> <p>h. Restrictions and precautions for use due to very rare reports of disabling and potentially long-lasting or irreversible side effects (MHRA Drug Safety Update).</p>
Enteric and Intra-abdominal Infections			
<p><i>The vast majority of enteric and intra-abdominal infections are self-limiting and do <u>not</u> require systemic treatment</i> **Antibiotics are rarely required**</p>		<p>Investigation/Treatment</p> <p>a. In acute food poisoning, avoid antibiotics.</p> <p>b. Only treat with ciprofloxacin, where the patient is <u>very</u> systemically unwell, particularly the elderly/debilitated.</p> <p>c. Food poisoning cases are notifiable to CCDC in Health Protection Unit.</p> <p>d. Take stool cultures. This is particularly important for young children, patients who have been abroad, or have bloody diarrhoea.</p> <p>e. Remember oral rehydration.</p> <p>f. Enteric fevers (Typhoid/Paratyphoid): longer treatments are required as guided by microbiologists.</p>	
Antibiotic Associated Diarrhoea			
<p><i>(If laboratory has confirmed this is caused by C. difficile then refer to guidance on page 26)</i></p> <p>Stop offending antibiotic and / or PPI where possible (see separate guidance on following page 26)</p>			

Drug	Adult Dose	Duration	Help Notes	
Enteric and Intra-abdominal Infections (Cont.)				
<i>Campylobacter</i>				
Clarithromycin (Refer to help notes h and i)	250mg to 500mg BD	For 5-7 days if treated early	g. Cryptosporidium is a self-limiting infection with no proven treatment. Duration of diarrhoea may be longer than with other gut infections. h. It is recognised that ciprofloxacin is not as effective as other antibiotics for treatment of <i>Campylobacter</i> due to high levels of resistance, therefore this is treated with clarithromycin. i. Pregnancy: erythromycin is preferred over clarithromycin (see page 5). j. Pregnancy: avoid 2g dose of metronidazole, treat with low dose regime - 500mg BD metronidazole for 7 days.	
<i>Giardia Infection</i>				
Metronidazole (Refer to help notes j)	2g once daily	For 3 days		
<i>Helicobacter Pylori</i>				
For <i>Helicobacter pylori</i> eradication: see BNF and NICE dyspepsia guidelines. Mims: Treatment Regimens for Eradication of H.pylon (PHE Guideline) .				
<i>Salmonella/Shigella</i> (antibiotics are rarely required)				
Ciprofloxacin (Refer to help notes b, e, and k to m)	500mg BD	For 3 days	Additional drug information Quinolones: k. Risk of <i>C. difficile</i> disease with quinolones. Stop immediately if diarrhoea occurs. In patients at high risk of, or previous <i>C. difficile</i> disease use an alternative agent. l. Small increased risk of aortic aneurysm and dissection; advice for prescribing in high-risk patients (MHRA Drug Safety Update). m. Restrictions and precautions for use due to very rare reports of disabling and potentially long-lasting or irreversible side effects (MHRA Drug Safety Update).	

CHAPTER 5: RESPIRATORY

Drug	Adult Dose	Duration	Help Notes
Acute Cough / Bronchitis			
First line: Doxycycline <i>(Pregnant women: refer to help note f)</i>	200mg STAT then 100mg OD	For 5 days	a. Most cases are viral. b. Antibiotic is of little benefit if no co-morbidity. c. For patients in who antibiotics is felt to be indicated, consider: i) Immediate antibiotics if; • >80 years and ONE of the following: hospitalisation in the past year, oral corticosteroids, diabetic, congestive heart failure OR • >65 years with 2 of the above. ii) For all patients: 7-14 day delayed antibiotic with symptomatic advice/leaflet. If practices do not have such a leaflet RCGP offers a helpful resource . <i>(Refer to help note d)</i> d. Symptom resolution can take 3 weeks. e. CRP levels can be used to guide treatment when considering if antibiotic prescription is indicated or not. Although definitive criteria and guidance on when to issue a prescription or defer issue with the use of CRP testing apparatus is not provided within the scope of this guidance. f. Doxycycline should be avoided in pregnancy. g. Pregnant patients with a penicillin allergy; discuss treatment options with a microbiologist.
Alternative first line: Amoxicillin	500mg TDS	For 5 days	
Children first line: Amoxicillin	Refer to Children's BNF	For 5 days	
Children alternative first line: Clarithromycin OR Erythromycin	Refer to Children's BNF	For 5 days	
Refer to Children's BNF	Refer to Children's BNF	For 5 days	
Always check the Children's BNF for calculation of doses in children.			
Acute Infective Exacerbation of Bronchiectasis			
<ul style="list-style-type: none"> Patients with bronchiectasis require single pneumococcal vaccination and annual influenza vaccination. Always base choice on results of previous sputum cultures and response to previous treatment. 			a. High doses of amoxicillin; e.g. 3g BD for 14 days are sometimes given to patients with advanced cystic bronchiectasis to improve sputum penetration. b. Patients with severe impairment of lung function or who have developed acute respiratory failure may require IV therapy and hospital admission. c. There is little evidence to support the use of inhaled antibacterials during exacerbations. d. There is little evidence on whether long-term antibacterial therapy should be given between exacerbations. This will depend on individual patients, for some longer courses of therapy may be preferential, usually on advice of the respiratory team.
First line: Amoxicillin OR	500mg TDS	For 14 days	
Doxycycline OR <i>(Pregnant women: refer to help note g)</i>	200mg STAT then 100mg OD	For 14 days	

Drug	Adult Dose	Duration	Help Notes
Acute Infective Exacerbation of Bronchiectasis (Cont.)			
<p>For use in <i>Pseudomonas</i> colonisation ONLY: Ciprofloxacin (Refer to help notes g to j)</p>	<p>500mg BD</p>	<p>For 14 days</p>	<p>e. MPC has approved the use of inhaled (nebulised) colistimethate in people with non-Cystic Fibrosis bronchiectasis under the following circumstances:</p> <ul style="list-style-type: none"> • Frequent exacerbations requiring antibiotic therapy • Evidence of <i>P. aeruginosa</i> infections causing exacerbations • Previous IV antibiotic therapy required and where, for example, resistance to ciprofloxacin has developed, or there are problems with venous access • Treatment with colistimethate must be initiated within secondary care; on-going prescribing in primary care is supported <p>f. Colistimethate sodium (Colomycin® injection, Promixin®) is only licensed for treating pulmonary infections caused by <i>P. aeruginosa</i> in people with cystic fibrosis but not in non-cystic fibrosis bronchiectasis.</p> <p>g. Doxycycline and ciprofloxacin should be avoided in pregnancy.</p> <p><u>Additional drug information</u> <u>Quinolones:</u></p> <p>h. Risk of <i>C. difficile</i> disease with quinolones. Stop immediately if diarrhoea occurs. In patients at high risk of, or previous <i>C. difficile</i> disease use an alternative agent.</p> <p>i. Small increased risk of aortic aneurysm and dissection; advice for prescribing in high-risk patients (MHRA Drug Safety Update).</p> <p>j. Restrictions and precautions for use due to very rare reports of disabling and potentially long-lasting or irreversible side effects (MHRA Drug Safety Update).</p>

Bronchiolitis

- Bronchiolitis is an acute lower respiratory tract illness occurring during the first two years of life.
- It is viral in origin. Respiratory Syncytial Virus (RSV) causes the majority of cases, with parainfluenza viruses being the next most commonly isolated.
- The diagnosis of bronchiolitis is made most frequently on the basis of the characteristic clinical and epidemiological findings.
- The diagnosis may be aided by the rapid identification of the causative virus. The viruses may be detected from nose and throat swabs sent in viral transport medium, but this would be rarely required in primary care.
- Studies have shown that the risk of secondary bacterial infection in infants with RSV infection is low.
- **As the condition is viral in origin, antibiotics are not routinely indicated. Severely ill infants should be referred to secondary care.**

Drug	Adult Dose	Duration	Help Notes
Chronic Obstructive Pulmonary Disease (COPD) Acute Exacerbations			
<ul style="list-style-type: none"> • COPD patients require single pneumococcal vaccination and annual influenza vaccination. • Many acute infective exacerbations are <u>viral</u>, and <u>do not require antibiotics</u> (refer to help notes a and b) 			<ul style="list-style-type: none"> a. Patients with recurrent infections will require longer courses, and sputum cultures should be taken. b. Consider standby home packs of 1st line antibiotics and oral corticosteroids, if indicated, for appropriate patients. c. In some circumstances more than 7 days treatment may be needed, particularly in patients with features of bronchiectasis. d. Treat exacerbations promptly with antibiotics if purulent sputum and increased SOB and/or increased sputum volume. e. Risk factors for antibiotic resistant organisms include: <ul style="list-style-type: none"> • Co-morbid disease • Severe COPD • Frequent exacerbations • Antibiotics in the last 3 months f. Doxycycline should be avoided in pregnancy. g. Pregnancy: erythromycin is preferred over clarithromycin (see page 5).
First line: Amoxicillin OR	500mg TDS	For 5 days	
Doxycycline (also for use in penicillin allergy) (Pregnant women: refer to help note f)	200mg STAT then 100mg OD	For 5 days	
Second line or penicillin allergy: Clarithromycin (Pregnant women: refer to help note g)	500mg BD	For 5 days	
If resistance risk factors (refer to help note e): Co-amoxiclav (Ensure positive sputum sample result before prescribing)	625mg TDS	For 5 days	
Community Acquired Pneumonia			
Manage using clinical judgment and modified CRB-65 score as follows (each scores 1): New onset C onfusion (AMT <8) R espiratory rate >30/min B P systolic <90mmHg and diastolic <60 A ge > 65 years Values: Score = 0, risk of death <1% Score =1-2, risk of death 1-10% Score ≥ 3, risk of death >10%			<ul style="list-style-type: none"> a. If pneumonia is suspected, pneumococci account for 70+% of cases. b. In Worcestershire penicillin resistance in pneumococci is extremely rare. c. If an atypical pneumonia is strongly suspected, then clarithromycin is 1st choice. d. Pregnancy: erythromycin is preferred over clarithromycin (see page 5). e. Doxycycline should be avoided in pregnancy.

Drug	Adult Dose	Duration	Help Notes
Community Acquired Pneumonia (Cont.)			
Mild infection (CRB-65 score 0) Usually suitable for home treatment:			f. Stop antibiotic treatment after 5 days, unless microbiological results suggest a longer course is needed or the person is not clinically stable.
Amoxicillin	500mg TDS	For 5 days	
If penicillin allergy: Clarithromycin OR (Pregnant women: refer to help note d)	500mg BD	For 5 days	
Doxycycline (Pregnant women: refer to help note e)	200mg STAT then 100mg OD	For 5 days	
Moderate infection (CRB-65 score 1 or 2) Consider hospital assessment or admission:			
Amoxicillin AND Clarithromycin OR (Pregnant women: refer to help note d)	500mg TDS 500mg BD	For 5 days (Refer to note f)	
Doxycycline (Pregnant women: refer to help note e)	200mg STAT then 100mg OD		
If penicillin allergy: Clarithromycin or doxycycline (see above for dose, duration and help notes).			
Severe infection (CRB-65 score ≥ 3):			
Urgent hospital admission.			

Croup – Acute Laryngotracheobronchitis

- Croup is an acute viral infection of the upper and lower respiratory tract that occurs in young children. The peak incidence is in the second year of life, with most cases occurring between 3 months and 3 years of age.
- Croup is caused by a variety of viral agents and occasionally *M. pneumoniae*. Parainfluenza virus Type 1 is the most common cause of croup in the U.K.
- The diagnosis of croup is usually based on the characteristic clinical picture.
- The diagnosis may be aided by the rapid identification of the causative virus. The viruses may be detected from nose and throat swabs sent in viral transport medium, but this would be rarely required in primary care.
- Bacterial infection superimposed or occurring after croup is uncommon and administration of antibiotics to children with croup prophylactically or without evidence of concomitant bacterial infection is not warranted.
- Patient information leaflets are available from www.nhs.uk/medicines/.

Additional Notes: Respiratory Tract Infection

Common Pathogens: *H. influenzae* *S. pneumoniae* *M. catarrhalis* **Atypical:** *M. pneumoniae* *L. pneumophila*

Clinical Details:

1. Use of beta-lactam antibiotics - **amoxicillin remains the treatment of choice in patients not allergic to penicillins**, as resistance in pneumococci is rare locally; most strains of *H. influenzae* are also sensitive. Question carefully about penicillin allergy to validate it. Co-amoxiclav is active against beta-lactamase producing organisms, such as some strains of *H. influenzae* and *M. catarrhalis* but does not improve cover against pneumococci compared to amoxicillin.
2. Uses of macrolides - azithromycin, clarithromycin and erythromycin all have a similar spectrum of activity, and resistance to one usually indicates resistance to all these compounds and *vice versa*. *H. influenzae* infection does not respond to macrolides.
3. Use of cephalosporins (e.g. cefalexin) – inappropriate as oral agents for chest infections (insufficient activity against *Haemophilus sp*), also increased risk of *C. difficile* disease.
4. Use of quinolones – not generally advised due to risk of *C. difficile* disease. Ciprofloxacin and ofloxacin are not reliably effective against pneumococci, and should not be used to treat pneumonia. Quinolones penetrate into lung tissue well and are thus useful in treating difficult cases of COPD and bronchiectasis with certain Gram-negative pathogens, e.g. *Serratia* and *Pseudomonas*. These organisms are relatively rare in patients in primary care. They are not licensed for use in children or in pregnancy, although ciprofloxacin has been used extensively in paediatric cystic fibrosis.
5. Use of tetracyclines - there is little difference in activity for various tetracyclines. Most clinical experience in the UK is with doxycycline. Sensitivity to one tetracycline usually implies sensitivity to all and *vice versa*. Most of the atypical organisms are sensitive, as are a majority of pneumococci and *H. influenzae* isolates. Tetracyclines cannot be used in children <12 years or pregnancy and their role is limited to less severe infections in adults.
6. Consider pneumococcal and influenza vaccines in at risk cases, see annual CMO letter and HMSO Publication Immunisations against Infectious Diseases.
7. It is important to consider whooping cough (pertussis) and tuberculosis in cases of chronic cough unresponsive to standard antimicrobial therapy.

Drug	Adult Dose	Duration	Help Notes
Whooping Cough			
Telephone Public Health England (PHE) with any suspected or confirmed cases. Tel: 0344 2253560 select option 2 – refer page 66 for further contact details			<p>a. If strong clinical suspicion of whooping cough, refer to microbiology for a pernasal swab for immediate processing to improve isolation rates of <i>B. pertussis</i>.</p> <p>b. Causative organism is <i>B. pertussis</i>. However, the classical symptoms of whooping cough may also be the result of other agents, notably parainfluenza virus.</p> <p>c. Whooping cough is a notifiable disease under the Health Protection Legislation (England) Guidance 2010. Suspected cases should be notified to the local health protection team (HPT). This should be done by telephone as soon as is practicable and in writing within 3 days. Complete the notification and email to: pertussis@phe.gov.uk If further information is needed, contact local HPT or Public Health Consultants if out of hours.</p> <p>References</p> <p>d. Patient information leaflet available on: www.nhs.uk/medicines/</p> <p>e. Reference: Guidelines for the Public Health Management of Pertussis in England.</p> <p>f. Public Health England: Pertussis brief for healthcare professionals.</p>
First line: Azithromycin	500mg OD	For 3 days	
Pregnancy: Erythromycin	500mg QDS	For 7 days	
Second line: Discuss with microbiologist.			
<p>Chemoprophylaxis may be recommended if: Onset date in the index case is within the preceding 21 days AND there is a vulnerable close contact; these are:</p> <ul style="list-style-type: none"> • Newborn infants born to symptomatic mothers • Infants under 1 year who have received less than 3 doses of DTaP/IPV/Hib • Unimmunised and partially immunised infants or children up to 10 years • Women in the last month of pregnancy • Children/adults who attend/work in a healthcare, social care or childcare facility • Immunocompromised individuals (as per Green Book) • Presence of other chronic illnesses, e.g. asthma <p>Where both conditions are met – ALL close contacts should be given prophylaxis. Contact PHE/microbiologist for further details. Dose same as for treatment.</p> <p><i>Refer to help notes e and f for further links and references, in particular treatment regimen in children.</i></p>			

CHAPTER 6: SKIN AND SOFT TISSUE INFECTIONS

Drug	Adult Dose	Duration	Help Notes
Acne			
<i>This document should be used to support local guidance: Acne prescribing</i>			
Mild Acne			
First line: topical treatment Benzoyl peroxide <i>Advise to buy OTC (refer to help note a).</i>	Apply 5% OD-BD	Continue for at least 12 weeks provided there has been adequate response. (NICE CKS)	<p>a. Self-care: Acne is a common skin condition that can be controlled with treatment. Patients should be encouraged to manage mild acne with long term use of OTC creams, lotions or gels. Treatments can take up to three months to work. Advise patients/parents to purchase OTC gel from community pharmacies (check license); in line with national recommendations NHSE Conditions for which over the counter items should not routinely be prescribed in primary care.</p> <p>b. Resistance of <i>P. acnes</i> to both topical and oral antibiotics is rapidly developing. Topical antibiotics should not be used as monotherapy.</p> <p>c. For comedonal acne topical retinoids are the treatment of choice. Avoid using topical retinoids in pregnancy and breastfeeding.</p> <p>d. Mild infection can be treated with topical antibiotics or benzoyl peroxide (the latter is generally cheaper).</p> <p>e. Treclin® is not recommended for use in children below 12 years of age.</p> <p>f. All tetracyclines are probably equally effective.</p> <p>g. Tetracycline contra-indications for use include:</p> <ul style="list-style-type: none"> • Children under 12 years old • Pregnant and breast-feeding women • May exacerbate renal failure and should not be given to patients with kidney disease except for doxycycline <p>h. Tetracycline cautions include patients with hepatic impairment or those receiving potentially hepatotoxic drugs.</p> <p>i. Tetracyclines may cause photosensitivity.</p> <p>j. Avoid minocycline due to risk of hepatotoxicity.</p> <p>k. Pregnancy and breastfeeding: Erythromycin 500mg BD - when treatment is deemed necessary in pregnancy and benefit(s) outweigh the risk(s).</p>
Second line: topical treatment Benzoyl peroxide 5% (or 3%) + clindamycin 1%; e.g. Duac® once daily gel	Apply OD in the evening, to the entire affected area.	Continue for at least 12 weeks provided there has been adequate response. (NICE CKS)	
OR			
Tretinoin 0.025% + clindamycin 1%; e.g. Treclin® gel (Pregnant women: refer to help note c)	Apply OD, (to be applied thinly at bedtime). <i>(Age restriction; refer to help note e)</i>	Should not exceed 12 weeks of continuous use without careful evaluation (NICE CKS)	
Moderate Acne			
MUST be <u>Combination therapy</u>: oral antibiotics with benzoyl peroxide or topical retinoids, please refer to <i>H&W Acne Guidance</i>.			
Oral treatment (refer to help notes f to k):			
Oxytetracycline OR	500mg BD	For 8-12 weeks	
Lymecycline OR	408mg OD	For 8-12 weeks	
Doxycycline	100mg OD	For 8-12 weeks	

Drug	Adult Dose	Duration	Help Notes
Animal and Human Bites			
First line (Refer to help note b and c): Co-amoxiclav	625mg TDS	Prophylaxis for 3 days Treatment for 5 days	<p>a. Superficial bites where the skin is not broken require local treatment only.</p> <p>b. Prescribe prophylactic antibiotics for all human bites <72 hours old and animal bites <48 hours old with high infection risk, defined as ≥ 1 of: wounds requiring surgical debridement; wounds involving joints, tendons, ligaments, or suspected fractures; wounds that have undergone primary closure; wounds to people who are at risk of serious wound infection (e.g. those who are diabetic, cirrhotic, asplenic, immunosuppressed, people with a prosthetic valve or a prosthetic joint).</p> <p>c. Refer to A&E for further assessment and management if wound closure is necessary.</p> <p>d. In cases of penicillin allergy in children <12 years of age and pregnant women, seek microbiology advice.</p> <p>e. For human bites consider blood-borne viruses. Follow the blood-borne contamination incident policy found on the Worcestershire Health Services link: Blood Borne Contamination Incident (Appendix I).</p> <p>f. Consider rabies risk if bitten abroad or by a bat bite in the UK. See PHE website for more information and contact details to discuss vaccination and immunoglobulin.</p> <p>g. Check tetanus status.</p>
Penicillin allergy (Refer to help note b to d): Doxycycline AND Metronidazole	100mg BD 400mg TDS	Prophylaxis for 3 days Treatment for 5 days	
<p>In children use co-amoxiclav (refer to help notes b to d).</p> <p>Always check the Children's BNF for calculation of doses in children.</p>			
Cellulitis, Erysipelas and Insect Bites			
First line: Flucloxacillin	500mg QDS	For 7 days; if slow response, continue for a further 7 days.	<p>Treatment</p> <p>a. In rapidly spreading cellulitis, consider parenteral antibiotics.</p> <p>b. Diabetic patients are a special subgroup and require a different approach - see additional notes page 39.</p> <p>c. For recurrent cellulitis of lower limb, exclude fungal foot infections and in-growing toe nails.</p> <p>d. For facial cellulitis (sometimes termed "pre-septal cellulitis"), use co-amoxiclav 625mg TDS for 7-14 days.</p> <p>e. If a patient is known to be colonised with MRSA, please check reported sensitivities: oral doxycycline can be used on an empirical prescription.</p> <p>f. Pregnancy: erythromycin is preferred over clarithromycin (see page 5).</p> <p>g. Bacterial isolates with resistance to erythromycin can be considered clarithromycin resistant, unless the report specifically indicates sensitivity.</p>
Penicillin allergy: Clarithromycin OR (Refer to help notes f and g)	500mg BD	For 7 days; if slow response, continue for a further 7 days.	
Doxycycline (Refer to help note h)	200mg STAT and then 100mg OD	For 7 days; if slow response, continue for a further 7 days.	

Drug	Adult Dose	Duration	Help Notes
Cellulitis, Erysipelas and Insect Bites (Cont.)			
<p>Home IV therapy may be considered for cases that fail to respond.</p> <p>Before starting IV therapy, consider optimising oral therapy by increasing dose of oral flucloxacillin to 1g QDS.</p> <p>Refer to: IV Antimicrobial Therapy at home for adults, Guidelines for Worcestershire. If there is treatment failure at 7 days - refer to IV team. Reference: (www.hacw.nhs.uk WHCT clinical policies)</p>	<p>h. Doxycycline should be avoided in pregnancy and children under 12 years old.</p> <p>i. Insect bites: A rapid-onset skin reaction after insect bites is most likely to be inflammatory or allergic rather than infective. Most insect bites can be managed without antimicrobials. The inflammation associated with insect bites can take up to ten days to resolve. Reassess if: symptoms or signs of an infection develop, the person's condition worsens rapidly or they become systemically unwell and/ or the person has severe pain out of proportion to the wound, which may indicate the presence of toxin-producing bacteria. Take account of other possible diagnoses, such as Lyme disease, indicated by erythema migrans, refer to the Lyme disease section of this guidance. Link to on Insect bites and stings NICE NG182 guidance.</p> <p>Seek Advice from Consultant Microbiologist</p> <p>j. Beware puncture wounds.</p> <p>k. For unusual circumstances e.g. after travel abroad, exposure to salt or fresh water.</p> <p>Urgent Referral</p> <p>l. Refer patients with orbital cellulitis urgently to the hospital.</p> <p>m. In rapidly spreading cellulitis – a potential medical emergency.</p>		
Cellulitis Associated with Lymphoedema			
<p>First line: Flucloxacillin</p>	500mg QDS	For no less than 14 days.	<p>a. Refer to full WHCT Lymphoedema guidelines for the management of these patients. The management of this group of patients is multifactorial and antibiotic treatment is only a part.</p> <p>b. It may take as long as 1-2 months of treatment to achieve complete resolution.</p> <p>c. Pregnancy: erythromycin is preferred over clarithromycin (see page 5).</p> <p>d. If patient is known to be colonised with MRSA, consider doxycycline. <i>Refer to help note h. (Doxycycline should be avoided in pregnancy)</i></p> <p>e. The risk of further attacks is high, so consider a two week home supply.</p> <p>f. Prophylaxis may need to be life-long if relapse occurs when antibiotics are discontinued after a two-year period of successful prophylaxis.</p> <p>Seek Advice from Consultant Microbiologist</p> <p>g. If diarrhoea develops, stop antibiotics.</p> <p>h. If patient is known to be colonised with MRSA and a second agent may need to be added e.g. sodium fusidate or rifampicin for optimal tissue penetration.</p> <p>i. Long-term antimicrobial prophylaxis may be beneficial in certain cases of recurrent lower limb cellulitis.</p>
<p>Penicillin allergy: Clarithromycin</p> <p><i>(Pregnant women: refer to help note c)</i></p>	500mg BD	For no less than 14 days.	
<p>If there is no response after 48 hours: Clindamycin</p>	450mg QDS	For no less than 14 days.	

Additional Notes: Bacterial Skin Infections - Cellulitis

Common Pathogens:

S aureus (including MRSA)

B-haemolytic Streptococci (A, B, C, G)

Less common pathogens:

Coliforms and Pseudomonas (commensal - rarely pathogenic)

Deep ulcers with peripheral vascular disease and/or diabetes mellitus – as above, plus anaerobes, coliforms, *Pseudomonas*

Please note:

To optimise analgesia; NICE CKS recommends paracetamol and ibuprofen for pain and fever.

Clinical Details:

Cellulitis: (also refer to local dressings, leg ulcer policies and lymphoedema guidelines)

All cases of cellulitis should be treated promptly, to reduce the risk of development of sepsis. In most cases the causative agents are beta-haemolytic streptococci. Secondary infection of existing wounds with *S. aureus* is relatively common, especially in diabetic patients. Cellulitis in special groups such as immunocompromised patients and diabetics may be due to other less common pathogens as well. *H. influenzae* cellulitis is occasionally seen in children, often orbital. Treatment should be with co-amoxiclav (IV cefotaxime may be necessary). Cellulitis can develop into necrotising infections; e.g. anaerobic cellulitis and gas gangrene. Like rapidly spreading cellulitis, these are regarded as surgical emergencies.

Diabetic patients:

Whilst staphylococcal skin infections are common in diabetics, other organisms can often be present. Coliforms (including *E. coli* and *Klebsiella spp.*) and group B streptococci can cause infection in diabetics in areas of ischaemia, trauma or abdominal surgery. *Pseudomonas* is also an opportunistic pathogen in diabetic skin infections.

For diabetic foot infections:

Start treatment but refer to Multi-Disciplinary Footcare Team (MDFT) to establish and manage the underlying cause. Consider taking swabs but start treatment with antibiotics. The WHCT [diabetes footcare page](#) contains links to the MDFT referral pathway and the referral form (contact details page 66).

Local infection involving only the skin and subcutaneous tissue; if erythema must be 0.5 to less than 2 cm around the ulcer (exclude other causes of inflammatory response, such as trauma, gout, acute Charcot, neuro-osteoarthropathy, fracture, thrombosis and venous stasis). Consider **flucloxacillin 1000mg QDS for 7 days [or doxycycline 200 mg orally single dose on day 1 then, then 100 mg twice a day for 7 days, if penicillin allergic]; up to a further 7 days may be needed based on clinical assessment.** Signs of active clinical infection such as increasing pain, spreading cellulitis, exudates and pus should be treated with **co-amoxiclav 625mg TDS for 2 to 4 weeks.** Review after one week and consider a further supply and/or send swab to microbiology. If patient allergic to penicillin or any queries relating to the choice of antibiotic – discuss with microbiology.

If necrotic tissue present may require early debridement and high dose intravenous antibiotics – close review is essential.

Furunculosis and folliculitis:

Oral antibiotic treatment is rarely necessary, and topical chlorhexidine may be helpful in reducing recurrent episodes. Flucloxacillin should be used if there is a facial abscess.

Drug	Adult Dose	Duration	Help Notes
Chickenpox			
Aciclovir	800mg 5 times a day	For 7 days	<p>Treatment should be considered:</p> <ul style="list-style-type: none"> • If rash started <24hours AND • Age >14 years or severe pain or dense/oral rash or secondary household case or corticosteroids or smoker. <p>a. Consider treatment in any adult seen within 24 hours of onset of disease.</p> <p>b. Severely affected individuals may need hospital admission.</p> <p>c. Treatment is not generally indicated for immunocompetent children, where the disease is usually milder. Chickenpox is occasionally lethal in adults.</p> <p>d. Secondary bacterial skin infections may occur.</p>

Additional Notes: Chickenpox and Shingles

Pathogens:

Chickenpox - *Varicella zoster*
Shingles - *Herpes Zoster*

Cold Sores:

Cold sores resolve after 7-10 days without treatment. Topical antivirals applied prodromally reduce duration by 12-24 hours. Advise to buy products OTC from community pharmacies, in line with national recommendations [NHSE Conditions for which over the counter items should not routinely be prescribed in primary care.](#)

Clinical Details:

Pregnant women or immunosuppressed individuals in contact with chicken pox or shingles:

- Ask about history of chickenpox or shingles.
- Reassure those with definite clinical history of previous chickenpox that they are immune and are not at risk of re-infection.
- Those without a definite clinical history should be screened for immunity (10ml clotted blood to microbiology). For pregnant women, this test can be performed on stored 'booking' blood sample. Please contact microbiology. Note: approximately 50% of patients who do not have a history of chickenpox are, in fact, immune. If found to be non-immune and <20/40 gestation, then varicella-zoster immunoglobulin (VZIG) should be issued, to reduce risk of severe infection, providing the last contact was within 7-10 days. Advice will be given by a microbiologist and then VZIG issue arranged via central stocks held by Public Health England.
- At the time of writing this edition of the guideline, there is a national shortage of VZIG. Pregnant women at ≥20+1/40 gestation to delivery, who meet the criteria for issuing VZIG, **are now offered aciclovir 800mg QDS from days 7-14 after exposure.**
- Systemic therapy with aciclovir should also be considered in patients who develop chickenpox despite VZIG, or present too late for VZIG treatment to be appropriate.

Drug	Adult Dose	Duration	Help Notes
Eczema			
Topical antibiotic: Fusidic acid 2% cream OR (Refer to help note b)	Apply TDS	For 5 days	a. If no visible signs of infection in eczema, use of antibiotics (alone or with corticosteroids) encourages resistance and does not improve healing. b. Fusidic acid (topical); do NOT use on extensive areas, reserve use for very localised lesions only to reduce risk of resistance; NOT for repeated use.
Oral antibiotic: Flucloxacillin	500mg QDS	For 5 days	
Fungal Infection: Nail			
Amorolfine 5% nail lacquer <i>Available to buy OTC (refer to help note c).</i>	Apply 1-2 times weekly	Fingers: 6 months Toes: 12 months	a. Consider whether investigation/treatment is appropriate. b. Take clippings for culture. c. Topical treatment is expensive and only appropriate where infection is limited to distal end of nails. Products may be purchased OTC from community pharmacies according to license. d. Nail infections are usually trivial in most cases, but treatment actively recommended in diabetic, elderly patients or peripheral vascular disease to prevent a portal of entry for more severe infection. e. Monitor liver function according to manufacturer's guidance. f. For patients on current cytotoxic therapy, seek advice from oncology team.
Terbinafine (oral)	250mg OD	Fingers: 6 weeks Toes: 12 weeks	
Itraconazole (oral)	Pulsed courses of 200mg BD	For 7 days, repeated after a 21 day interval. Fingers: generally, require 2 courses. Toenails: generally, require 3 courses.	
Fungal Infection: Skin			
Topical agents e.g. Imidazole creams, or Terbinafine 1%, or Undecanoic acid <i>Advise to buy OTC (refer to help note c).</i>	Refer to: BNF Or SPC . Mycota® is an undecanoate preparation licensed for use in children. Always check the Children's BNF for calculation of doses in children.		a. Take scrapings for culture. b. Use topical creams if mild disease. c. Self-care: Fungal infections are not serious and are usually easily treated with treatment available OTC. Advise patients/parents to purchase OTC preparations from community pharmacies (check license); in line with national recommendations NHSE Conditions for which over the counter items should not routinely be prescribed in primary care. d. For extensive athlete's foot, oral terbinafine for 2 weeks should be considered. If imidazole creams are used (e.g. clotrimazole, econazole, miconazole) 4-6 weeks therapy may be required (i.e. continue 1-2 weeks after healing). e. For patients on current cytotoxic therapy, seek advice from oncology team. f. Terbinafine is not licensed for use in children.
Ketoconazole shampoo (for pityriasis versicolor)	Use once daily	For 1-5 days	
Terbinafine (oral)	250mg OD	For 2-4 weeks	
Itraconazole (oral)	200mg OD	For 7 days (pityriasis versicolor)	

Additional Notes: Fungal Infections

Common Pathogens: Clinical Details:

Nail infection - *Dermatophyte*

Athlete’s Foot, Ringworm - *Tinea*

1. Oral itraconazole is an alternative first line treatment for nail infection in people unable to tolerate terbinafine. Oral itraconazole has not demonstrated cure rates that are as good as those for terbinafine, but it may be useful in people with severe immunosuppression who have suspected counter infection with yeasts.
2. Non-dermatophyte fungal nail disease (onychomycosis), use itraconazole or topical amorolfine (mild distal disease only), in dosing schedules as previously specified.
3. Tinea capitis (scalp ringworm). The association of inflammation in the scalp with loss of hair and broken hairs should make one suspicious of scalp ringworm. Pluck hairs for mycology and do not rely on scraping alone. Topical treatments for scalp ringworm are not effective. Do not rely on Wood’s Light to make the diagnosis; many fungi that cause scalp ringworm are Wood’s Light negative. Treatment - oral griseofulvin 10mg/kg/day or terbinafine for 6 to 8 weeks. Discuss with specialist.
4. Tinea corporis/cruris - use topical terbinafine cream 1% twice daily for 2 – 4 weeks, or oral terbinafine 250mg OD for 2 weeks if severe.
5. For treatment in children, seek specialist advice.

Precautions:

Use topical treatments in pregnancy.

Drug	Adult Dose	Duration	Help Notes
Impetigo			
Always check the Children’s BNF for calculation of doses in children.			
Localised non-bullous (who are not systemically unwell or at high risk of complications)			
Topical antiseptic: Hydrogen peroxide 1% cream	Apply BD or TDS	For 5 days (Refer to help note b)	a. Fusidic acid (topical); NOT for extended or repeated use because antimicrobial resistance can develop rapidly. b. A 5 day course is appropriate for most people with impetigo but can be increased to 7 days based on clinical judgement, depending on the severity and number of lesions. c. Topical mupirocin 2% - reserve where possible for known MRSA infection or Panton-Valentine Leucocidin (PVL) toxin associated staphylococcal colonisation.
Topical antibiotic if hydrogen peroxide unsuitable: Fusidic acid 2% cream	Apply TDS		

Drug	Adult Dose	Duration	Help Notes
Impetigo (Cont.)			
Widespread non-bullous (who are not systemically unwell or at high risk of complications)			
Topical antibiotic: Fusidic acid 2% cream OR	Apply TDS	For 5 days (Refer to help note b)	d. Topical antimicrobial / antiseptic liquids and soaps are effective in reducing bacterial colonisation. (e.g. Octenisan®) available on FP10 or chlorhexidine or suitable alternatives available as recommended by Infection Control. e. Pregnancy: erythromycin is preferred over clarithromycin (see page 5).
First choice oral antibiotic: Flucloxacillin OR	500mg QDS		
Alternative oral antibiotic if penicillin allergy or flucloxacillin unsuitable: Clarithromycin (Pregnant women: refer to help note e)	250mg BD		
Bullous impetigo or impetigo in people who are systemically unwell or at high risk of complications			
First choice oral antibiotic: Flucloxacillin OR	500mg QDS	For 5 days (Refer to help note b)	
Alternative oral antibiotic if penicillin allergy or flucloxacillin unsuitable: Clarithromycin (Pregnant women: refer to help note e)	250mg BD (can be increased to 500 mg BD, if needed for severe infections.)		

Drug	Adult Dose	Duration	Help Notes
Leg Ulcers			
Flucloxacillin	500mg QDS	For 7 days; if slow response, continue for a further 7 days.	<p>Investigation/Treatment</p> <p>a. Ulcers are always colonised. Antibiotics do not improve healing unless active infection. Active infection is present if cellulitis / increased pain / pyrexia / purulent exudate / odour.</p> <p>b. If active infection present, send pre-treatment swab. Review antibiotic choice after culture results.</p> <p>c. Consider use of topical antimicrobial wound dressings if patient presents with evidence of critical colonisation or infection.</p> <p>d. <i>Pseudomonas</i> and other Gram-negative bacteria are common colonisers of moist sites. They do not usually cause significant infection unless the patient is diabetic, has critical ischaemia and/or is significantly immunocompromised. Treatment of infected leg ulcers should usually be directed against <i>S. aureus</i> and β-haemolytic streptococci in the first instance.</p> <p>e. Superficial swabs of leg ulcers poorly predict the infecting pathogen. If cultures are required, clean the slough off the ulcer; e.g. with gauze soaked in saline and swab the ulcer base.</p> <p>f. Pregnancy: erythromycin is preferred over clarithromycin (see page 5).</p> <p>References</p> <p>g. Refer to 'Guidelines for the assessment of the patient with leg ulceration' January 2013, available on the Worcestershire Health and Care Trust website (WHCT clinical policies).</p> <p>h. NICE CKS.</p>
Clarithromycin <i>(Pregnant women: refer to help note f)</i>	500mg BD	For 7 days; if slow response, continue for a further 7 days.	
Cutaneous Lyme disease ('erythema migrans'), also known as 'early localised disease'			
<p>First line: Doxycycline <i>(Refer to help note i)</i></p>	<p>100mg BD OR 200mg OD</p>	For 21 days	<p>Cases of 'early disseminated disease' (e.g. LMN facial nerve palsies, meningitis, conductive cardiac defects on ECG, pericarditis, ocular involvement) or 'late disease' (e.g. cognitive disturbance, persistent or intermittent arthropathy) should be discussed with infectious diseases or medical microbiology.</p> <p>a. Lyme disease or <i>L. borreliosis</i> is a bacterial infection spread by the bite of infected ticks.</p> <p>b. The most common cutaneous sign is a rash – termed erythema migrans. Other early systemic features include flu-like symptoms, aching, fever, headache, fatigue, sweating, joint pain, light and sound sensitivity and abnormal skin sensation.</p> <p>c. Patients with the typical erythema migrans rash should be treated empirically – serological testing is not indicated as c.30% of patients are seronegative at the time of rash onset.</p>
<p>Children < 12 or pregnancy: Amoxicillin</p>	1000mg TDS	For 21 days	

Drug	Adult Dose	Duration	Help Notes
Cutaneous Lyme disease ('erythema migrans'), also known as 'early localised disease' (Cont.)			
			<p>d. Patients with a credible history of tick bite, with no rash, and symptoms consistent with Lyme disease, should have serum sent to an NHS laboratory for testing.</p> <p>e. Up to a third of cases do not have a classical rash. Absence of a rash or recollection of a tick bite does NOT exclude the diagnosis.</p> <p>f. Antibiotic courses >21 days duration are not recommended in Primary Care. Patients requesting such treatment should be referred to Infectious Diseases.</p> <p>g. Intravenous treatment for Lyme disease should only be conducted under the supervision of an Infectious Diseases physician.</p> <p>h. Antimicrobial prophylaxis of asymptomatic individuals after a tick bite is not usually recommended.</p> <p>i. Doxycycline should be avoided in pregnancy and children under 12 years old.</p>
Mastitis			
Flucloxacillin (Refer to help note g)	500mg to 1000mg QDS	For 10-14 days	<ul style="list-style-type: none"> • Treat all cases of 'non-lactational' mastitis. • Prescribe antibiotics for lactating women with an infected nipple fissure or with symptoms that have not improved after >12 hours of effective milk removal. <p>a. Mastitis usually caused by <i>S. aureus</i> (in all age groups). Less frequent causes include streptococci, atypical mycobacteria (especially around breast prosthetic implants) and Gram-negative bacteria.</p> <p>b. When fluctuance is present, refer for surgical drainage.</p> <p>c. Fungi and candida are rare causes of mastitis. There is very little evidence to support the concept of candida as a cause of deep breast pain in lactation.</p> <p>d. Avoid drying/cracking of nipples during lactation. Visit NHS website.</p> <p>e. Breast feeding or expression via pump should continue, as it reduces maternal complications (by avoiding blocked milk ducts) and improves infant health.</p> <p>f. Identify and manage any contributing factors such as poor infant attachment (involve a breast feeding specialist as needed), remove nipple piercings and discard potentially contaminated topical nipple products.</p> <p>g. It is anecdotally reported that flucloxacillin can cause a change in the taste of breast milk which can affect the tolerability of this antibiotic in breast fed babies.</p> <p>h. Pregnancy: erythromycin is preferred over clarithromycin (see page 5).</p>
Penicillin allergy: Clarithromycin (Pregnant women: refer to help note h)	500mg BD	For 10-14 days	
Other measures include: <ul style="list-style-type: none"> • Breast support • Ice packs • Analgesics 			

Drug	Adult Dose	Duration	Help Notes
MRSA Colonisation: Eradication of MRSA Carriage			
Nasal Carriage			
First line: Mupirocin (Bactroban®) 2% nasal ointment <i>(Use only if known to be sensitive)</i>	Apply TDS	For 5 days; for 2 courses only.	a. Many laboratory reports of MRSA indicate colonisation not clinical infection. b. The decision to treat MRSA carriage will depend on the clinical setting – please see local infection control policy or discuss with the microbiologist/infection control team. c. Octenisan® wash lotion should be used like a shower gel daily, with a contact time of 1 minute on the skin. It also should be used 2 out of the 5 days like a shampoo on the hair. d. Advice can be sought from the community IPC Team to enhance the effectiveness of decolonisation regime. e. Throat carriage: significance is unclear, discuss all cases with a microbiologist. f. If patient has isolated PVL <i>S.aureus</i> and needs decolonisation then use this regime for treatment; refer to section on PVL <i>S.aureus</i> infections for further detail within the guidelines; page 49.
First line alternative option at times of a national shortage of Bactroban® (mupirocin): Octenisan® MD nasal gel <i>(Use only if known to be sensitive)</i>	Apply TDS (a pea size amount to each nostril)	For 5 days; up to 3 courses.	
Strains resistant to mupirocin or as a possible alternative option to Octenisan® MD nasal gel: Naseptin® nasal cream can be considered <i>(Do not use in patients with a known peanut and/or soya allergy)</i>	Apply QDS	For 10 days	
Skin Carriage			
Octenisan® antimicrobial wash lotion	Use daily <i>(Refer to help note c)</i>	For 5 days	See above notes.
MRSA Infection			
All cases: send sample for sensitivity to guide treatment. If culture and sensitivity results are available prior to commencing therapy, recommend select agents as per reports sensitivities of isolate.			a. Infected/Colonised wounds can be dressed with antimicrobial product e.g. iodine, silver or honey based preparation as indicated in Wound Formulary . Where possible wounds should be occluded with povidone iodine or chlorhexidine dressing.

Drug	Adult Dose	Duration	Help Notes
MRSA Infection (Cont.)			
Skin Lesions (small):			b. Avoid prolonged or repeated treatments. c. Mupirocin ointment must not be applied to large wounds (risk of nephrotoxicity with polyethylene glycol base). d. Mupirocin ointment may also damage PEG sites and other plastic devices; e.g. central venous lines. e. Send specimens for sensitivity testing to guide appropriate combination therapy. Dual combination of sodium fusidate and rifampicin together for treatment of infection is not advised ; it is ineffective and can encourage further resistance. f. Pregnancy: erythromycin is preferred over clarithromycin (see page 5), if the MRSA isolate is sensitive to this drug. g. Doxycycline should be avoided in pregnancy and children under 12 years old.
Mupirocin 2% cream/ointment	Apply TDS	For 7-10 days	
<i>(Refer to help notes c and d)</i>			
Mild to moderate infection requiring systemic treatment: <u>treat empirically</u>			
Doxycycline	100mg BD	For 5-7 days	
<i>(Refer to help note g)</i>			
Evidence of systemic or invasive infection: please consider contacting the Home IV team for treatment with IV agents. Tel: 01905 681818 and enter the options as indicated for the relevant locality.			
Parasite Infections: Head Lice			
<ul style="list-style-type: none"> There is no effective preventative therapy for head lice and parasiticial preparations used to treat head lice have no residual effect. There are 3 treatment options; note chemical treatments are not recommended if <u>only</u> eggs are detected. 			a. Advise patients/parents to purchase head lice products OTC from community pharmacies ; in line with national recommendations NHSE Conditions for which over the counter items should not routinely be prescribed in primary care . b. Pregnancy or breastfeeding: wet combing or dimeticone 4% lotion are recommended as first-line. c. Treatment failure with a chemical product should only be considered after checking: <ul style="list-style-type: none"> A complete treatment course? Correct application technique? Correct application time? A sufficient volume of product to cover hair adequately?
<i>Advise to buy OTC (refer to help note a).</i>			
1. Treatment without parasiticial liquid (wet combing): The combing method is an option for those reluctant to use chemicals; however, it requires a substantial time commitment to ensure all hair is combed through and may fail if not done correctly. The combing method uses a detection comb to physically remove lice from hair. It must be undertaken every 3 days for at least 2 weeks (longer in severe cases). The hair is washed in the normal way and towel dried. Application of conditioner helps the comb to slide through the hair more easily; it has no inherent parasiticial properties.			

Drug	Adult Dose	Duration	Help Notes
Parasite Infections: Head Lice (Cont.)			
<p>2. Treatment with other products: Dimeticone 4% lotion has a physical rather than chemical mode of action and so has potential benefits as an alternative to conventional chemical insecticides as no resistance towards it has been documented.</p> <p>When covered by dimeticone in its silicone solvent, lice become immobilised, from which they never recover. Dimeticone is not absorbed transdermally.</p>		<p>3. Treatment with a parasitocidal liquid: Malathion (e.g. Derbac M® liquid) is a parasitocidal liquid. One product should be used for a course of treatment (2 applications, 7 days apart); if this fails, then another product with a different active ingredient should be tried.</p>	
Parasite Infections: including Scabies			
<p>For both preparations below:</p> <ul style="list-style-type: none"> Apply 2 applications, one week apart (see drug patient information leaflet for further details). Ensure sufficient quantity is prescribed to cover body size. 		<p>a. Additional sources for help and advice are the Infection Control Policies and Procedures produced by the Worcestershire Acute Hospitals NHS Trust.</p> <p>b. Since symptoms take several weeks to appear, it is easy for close contacts to become infected before the disease is suspected. Therefore, all close (body) contacts (whether symptomatic or not) should be treated at same time as the index case. Non-compliance by just one individual may make the difference between a success or failure of a planned treatment. The manufacturer's instructions must be followed carefully.</p> <p>c. Treat all home and sexual contacts with 24 hours treatment course or according to the manufacturer's recommendations. Treat whole body from ear/chin downwards and under nails. If under 2 or elderly, also treat face and scalp.</p> <p>d. Do not use Lyclear® dermal cream in pregnant or breast-feeding women, nor in very small children. Derbac M® liquid may be used with caution in pregnancy.</p> <p>e. For crusted scabies, seek advice from Health Protection Team.</p> <p>f. Outbreaks of scabies in care homes must be reported to Public Health England. Specialist advice will be given for treatment of residents and staff.</p> <p>g. Bedding and clothing may be washed in the normal manner. No special precautions are necessary.</p>	
<p>First line: Permethrin dermal cream 5% (Lyclear®)</p> <p>(Refer to help note d)</p>	<p>Refer to BNF or Children's BNF for further instructions on application.</p>		
<p>If allergy to the above: Malathion 0.5% in aqueous base (Derbac M® liquid)</p>	<p>Refer to BNF or Children's BNF for further instructions on application.</p>		

PVL-producing *Staphylococcus aureus*

Panton-Valentine Leukocidin (PVL) is a toxin that destroys white blood cells and is a virulence factor in some strains of *S. aureus*. Strains of PVL-SA producing a new pattern of disease have emerged in the UK and worldwide. In the UK the genes encoding for PVL are carried by < 2% of clinical isolates of *S. aureus* submitted to the national Reference Laboratory, whether Methicillin Sensitive (MSSA) or Methicillin-Resistant (MRSA).

Like other *S. aureus* strains, PVL-SA predominantly cause skin and soft tissue infections (SSTI) but can also cause invasive infections. The most serious of these is a necrotising haemorrhagic pneumonia with a high mortality, which often follows a 'flu-like' illness and may affect otherwise healthy young people in the community.

Diagnosis and Management of PVL-*Staphylococcus aureus* infections: [Quick Reference Guide for Primary care.](#)

For guidance on local decolonisation please refer to MRSA colonisation eradication of carriage guidance on page 46.

Drug	Adult Dose	Duration	Help Notes
Scarlet fever			
First line: Phenoxymethylpenicillin (penicillin V) (Refer to help note c)	500mg QDS	For 10 days	a. Prompt treatment significantly reduces the risk of complications. b. Macrolide resistance in Group A Streptococci is c. 5%. Take a throat swab to confirm sensitivity in penicillin-allergic patients. c. Children may prefer the taste of amoxicillin oral suspension over phenoxymethylpenicillin. d. Pregnancy: erythromycin is preferred over clarithromycin (see page 5). e. Child should <u>not</u> attend school or nursery until at least 24 hours after commencement of antimicrobial therapy.
If patients find it difficult taking the above due to palatability, consider: Amoxicillin	500mg TDS	For 10 days	
Penicillin allergy: Clarithromycin (Refer to help notes b and d)	500mg BD	For 5 days	
Always check the Children's BNF for calculation of doses in children.			

Drug	Adult Dose	Duration	Help Notes
Shingles (<i>refer to help note e</i>)			
<p>Treatment should be considered for adults >50 years of age and within 72 hours of rash [Post Herpetic Neuralgia (PHN) rare if <50 years), and adults of any age who:</p> <ul style="list-style-type: none"> • Present with severe acute pain + extensive rash • Have ophthalmic involvement (requires urgent referral to ophthalmology) • Immunocompromised • Have Ramsay Hunt syndrome • Have atopic eczema • Have contact with very young infants, immunocompromised people or pregnant women. 			<ol style="list-style-type: none"> a. Start as early as practical, and within 72 hours of start of symptoms; reduces pain and PHN. b. Predictive factors for PHN are: elderly; extensive rash within 72 hours; severe/prolonged prodromal pain. c. See H&W Guidelines for the Management of Neuropathic Pain. d. Consider underlying immunosuppression secondary to HIV. e. Pregnant patients, immunocompromised and neonates seek urgent and specialist advice. <p><i>Please refer to p.40 for additional notes.</i></p>
Aciclovir	800mg five times a day	For 7 days	

CHAPTER 7: URINARY TRACT INFECTIONS (UTI)

Drug	Adult Dose	Duration	Help Notes
Acute Prostatitis			
Guided by susceptibilities when available.			Investigation/treatment
First line: Ciprofloxacin (Refer to help notes i to k)	500mg BD	For 28 days	a. Empiric treatment is common, but gonorrhoea and <i>chlamydia</i> should be excluded. b. Send MSU for culture and sensitivity. c. Consider an STI ; particularly in sexually active young men and those with no underlying renal tract abnormality. Send urine for <i>Chlamydia</i> and Gonorrhoea PCR. d. Most infections are caused by enteric Gram-negative bacteria. Common pathogens include <i>E. coli</i> , Gram negative bacilli and <i>Enterobacter spp.</i> e. Chronic bacterial prostatitis may require 4-6 weeks treatment – refer to NICE/CKS guidance. f. Prostatic tissues are best penetrated by drugs with a high pK _a and high lipid solubility, such as quinolones. g. Late relapse (6-12 months after treatment) is common.
Second line: Ofloxacin (Refer to help notes i to k)	200mg BD	For 28 days	
Alternative if above not tolerated: Trimethoprim	200mg BD	For 28 days	
Adjunctive Treatment: Advise paracetamol (+/- low-dose weak opioid) for pain, or ibuprofen if preferred and suitable.			Referral h. Refer all patients with STIs to Sexual Health Clinic.
			Additional drug information Quinolones: i. Risk of <i>C. difficile</i> disease with quinolones. Stop immediately if diarrhoea occurs. In patients at high risk of, or previous <i>C. difficile</i> disease use an alternative agent. j. Small increased risk of aortic aneurysm and dissection; advice for prescribing in high-risk patients (MHRA Drug Safety Update). k. Restrictions and precautions for use due to very rare reports of disabling and potentially long-lasting or irreversible side effects (MHRA Drug Safety Update).
Epididymo-Orchitis			
Self-care In all cases consider general support measures such as scrotal elevation (good supporting underwear), analgesia and bed rest.			Investigation/treatment Relevant investigations: urine for dual <i>Chlamydia</i> and Gonorrhoea PCR and urethral swab for <i>N. gonorrhoea</i> culture if clinically indicated. Send MSU for urine culture for enteric pathogens.

Drug	Adult Dose	Duration	Help Notes
Epididymo-Orchitis (Cont.)			
<p>If most probably due to chlamydia or other non-gonococcal organisms (for example, where gonorrhoea has been ruled out by gram stain and no risk factors for gonorrhoea identified; refer to help note e)</p>			<p>a. In males <35 years, often caused by STI such as <i>Chlamydia</i> – if suspected, advise to abstain from intercourse until treatment finished. Suggest partner is screened and treated.</p> <p>b. In males >35 years, often caused by non-sexually transmitted, Gram-negative enteric organisms that cause UTIs, however crossover between both groups occurs. If <i>N. gonorrhoea</i> is isolated, contact Sexual Health Clinic. Refer to page 66 for contact details.</p> <p>c. Testicular torsion (in all cases) should be considered as a differential diagnosis especially in patients under 20 (although this can occur at any age) presenting with acute onset severe pain; this requires urgent surgical referral.</p> <p>d. Consider mumps, particularly in non-immunised adults with history of headache, fever and unilateral/bilateral parotid swelling 7-10 days prior to testicular swelling. Antibiotics not indicated.</p> <p>e. Common risk factors for gonorrhoea: previous <i>N. gonorrhoeae</i> infection, known contact of gonorrhoea, presence of purulent urethral discharge, men who have sex with men and multiple recent sexual partners</p> <p>Referral</p> <p>f. Refer patients with a proven STI to the Sexual Health Clinic for further assessment, as those patients with gonococcal infection require treatment with IM ceftriaxone. Refer to page 66 for contact details.</p> <p>g. Refer to point c.</p> <p>Additional drug information</p> <p>Quinolones:</p> <p>h. Risk of <i>C. difficile</i> disease with quinolones. Stop immediately if diarrhoea occurs. In patients at high risk of, or previous <i>C. difficile</i> disease use an alternative agent.</p> <p>i. Small increased risk of aortic aneurysm and dissection; advice for prescribing in high-risk patients (MHRA Drug Safety Update).</p> <p>j. Restrictions and precautions for use due to very rare reports of disabling and potentially long-lasting or irreversible side effects (MHRA Drug Safety Update).</p>
Doxycycline OR	100mg BD	For 14 days	
Ofloxacin	200mg BD	For 14 days	
(Refer to help notes h to j)			
In cases where aetiology most probably due to enteric organisms			
Ofloxacin	200mg BD	For 14 days	
(Refer to help notes h to j)			

Additional Notes: Epididymo-orchitis

National guidelines produced by BASHH (British Association for Sexual Health and HIV) for the management of epididymo-orchitis make the following statements regarding the aetiology of acute epididymo-orchitis in relation to patient age.

- **Under 35 years** - most often a sexually transmitted pathogen such as *C. trachomatis* and *N. gonorrhoeae*.
- **Over 35 years** - most often non-sexually transmitted Gram-negative enteric organisms causing urinary tract infections, particular risks include recent instrumentation or catheterisation.

However the guidelines also state that:

- There is crossover between these groups and complete sexual history taking is imperative.

In light of this, if there is clinical concern of an STI in a patient >35 years of age presenting with symptoms of acute epididymo-orchitis, they should be treated accordingly.

[BASHH link.](#)

Drug	Adult Dose	Duration	Help Notes
Uncomplicated UTI (non-pregnant adults)			
<ul style="list-style-type: none"> • Consider 'back up' or 'delayed' antibiotic prescription in all cases. • As antimicrobial resistance and <i>E. coli</i> bacteraemia is increasing, USE NITROFURANTOIN FIRST LINE if appropriate. • Always give safety net, self-care advice and consider risk factors for increased resistance (refer to help note a). • Fluid promotion and early hydration is very important in all patient groups with UTI – ensure adequate fluid and hydration measures are in place. 			Investigation/treatment a. Consider risk factors for increased resistance which include: care home resident, recurrent UTI (≥ 2 in 6 months; ≥ 3 in 12 months), hospitalisation >7d in the last 6 months, unresolving urinary symptoms, recent travel to a country with increased resistance, and previous UTI resistant to trimethoprim, cephalosporins or quinolones. If increased resistance risk , send culture for susceptibility testing & give safety net advice. b. Asymptomatic bacteriuria: does NOT generally require treatment; it is common in the elderly, but not associated with increased morbidity. (See separate treatment in pregnancy guidance – page 56-57) c. Patients over 65: treat if fever $\geq 38^{\circ}\text{C}$ or 1.5°C above base twice in 12 hours and dysuria OR ≥ 2 other symptoms.
All patients 1st line: Nitrofurantoin (If eGFR ≥ 45 ml/min/1.73m ² MHRA Drug Safety Update)	100mg modified-release capsules BD (to aid compliance) OR 50mg every 6 hours	<u>Females:</u> for 3 days <u>Males:</u> for 7 days	

Drug	Adult Dose	Duration	Help Notes
Uncomplicated UTI (non-pregnant adults) (Cont.)			
If low risk of resistance: Trimethoprim <i>(Refer to help note j)</i>	200mg BD	<u>Females:</u> for 3 days	d. Women with severe or ≥ 3 symptoms: treat. e. Women with mild or ≤ 2 symptoms: pain relief and consider back-up/delayed antibiotic. <ul style="list-style-type: none"> If urine not cloudy, 97% NPV for UTI. If urine not cloudy, use dipstick to guide treatment: nitrite, leucocytes and blood all -ve 76% NPV; nitrite plus blood or leucocytes 92% PPV of UTI. f. Men: consider prostatitis and send MSU or if symptoms mild/non-specific, use negative dipstick to exclude UTI. Refer to prostatitis section on page 51. g. For elderly, males, pregnant patients or children, or where there is fever/loin pain always send off an MSU sample. h. For treatment in pregnancy , send MSU for culture and sensitivity and start treatment in line with specific prescribing notes on page 56-57. i. In catheterised patients , avoid treatment, unless patient is systemically unwell or pyelonephritis likely. If clinically unwell, consider co-amoxiclav (or ciprofloxacin in patients with a penicillin allergy), and send urine for culture. Do not give prophylactic antibiotics for catheter changes unless history of catheter-change-associated UTI or trauma (NICE and SIGN guidance). Take sample if new onset of delirium, or two or more symptoms of UTI.
If 1st line options unsuitable: Pivmecillinam <i>(If eGFR <45 ml/min/1.73m² and high risk of resistance; send urine sample)</i>	400mg STAT then 200mg TDS	<u>Males:</u> for 7 days	
If 1st line options unsuitable AND penicillin allergy: Fosfomycin	Female: 3g STAT <i>(Refer to note k regarding second dose)</i> Male: 3g STAT and then another 3g dose 3 days later (unlicensed)	<i>Refer to dose box for further details.</i>	
2nd Line options: As per MSU specimen sensitivity If only intravenous options remain available, the home IV team should be contacted [Tel number: 01905 681818].			Additional drug information <p>j. Do not use trimethoprim in patients on methotrexate as haematological toxicity can occur.</p> <p>k. Fosfomycin: A further dose may be given 3 days later in women with incomplete resolution of symptoms (unlicensed) where the causative organism has been shown to be fosfomycin susceptible by culture of urine.</p> Reference(s) <p>l. Refer to PHE Diagnosis of UTI Quick Reference Guide for Primary Care for further details</p> <p>m. Patient information leaflet: TARGET UTI leaflet.</p>

Additional Notes: UTI**Common Pathogens:**

<i>E.coli</i>	other coliform organisms	<i>S. saprophyticus</i>	<i>P. mirabilis</i>
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1. 60% of isolates are resistant to amoxicillin, and thus it is no longer suitable for empirical treatment of an UTI.
2. ESBL-producing organisms are becoming increasingly prevalent in the community and resistance patterns are emerging. ESBLs can confer resistance to ciprofloxacin and a broad range of beta-lactam antibiotics including co-amoxiclav. Occasionally ertapenem, a once daily parenteral agent, is advised.
3. Isolates are commonly still sensitive to nitrofurantoin (e.g. 98% of *E. coli* strains are sensitive), even ESBL-producing or CPE strains of Gram-negative bacteria. Nausea is a common problem with this drug which can be reduced using capsules and/or the modified-release (MR) version.
4. Pivmecillinam is an oral pro-drug of mecillinam, a beta-lactam antibiotic that is active against Gram-negative organisms such as *E. coli* and other enterobacteriaceae. It is not active against *Pseudomonas* or enterococci. Mecillinam is more active against ESBL-producing organisms than other beta-lactams and cephalosporins. As a beta-lactam antibiotic, pivmecillinam should not be prescribed in patients with penicillin allergy; fosfomycin should be prescribed as an alternative.
5. The presence of *Proteus* in the urine may suggest the possibility of renal or bladder calculi. Presence of *S. aureus* may indicate a deep seated, systemic infection such as osteomyelitis, vertebral infection or endocarditis.
6. Group B Streptococcus bacteriuria has been reported during pregnancy: treat infection and consider use of peripartum antibiotics – ensure maternity records are appropriately updated.
7. In sterile pyuria, consider urethritis; possible causes: *C. trachomatis*, tuberculosis (TB) or *M. genitalium*.
8. For men: consider prostatitis and send pre-treatment MSU OR if symptoms mild/non-specific, use –ve dipstick to exclude UTI.
9. Nitrofurantoin – avoid if eGFR less than 45ml/min/1.73m². Nitrofurantoin is excreted by the kidneys meaning that impaired renal function may lead to inadequate urine concentrations. There is also a risk of peripheral neuropathy. (see BNF or MHRA Drug Safety Update, Volume 8, Issue 2, September 2014, for further details). Reference: [MHRA Drug Safety Update](#)
10. In cases of severe renal impairment, please contact the consultant microbiologists for further advice. For patients currently treated by a renal unit, please seek further advice from their consultant renal physician.
11. Quinolones are highly effective, but should never be used routinely, and only with microbiologist advice for complicated infections. Quinolones and cephalosporins have been highly associated with the incidence of *C. difficile* diarrhoea.

Drug	Adult Dose	Duration	Help Notes
Lower UTI in children			
First line: Trimethoprim OR Nitrofurantoin OR <i>If susceptible</i> Amoxicillin	Refer to Children's BNF .	<u>Girls with normal urinary tract anatomy:</u> for 3 days <u>Boys or children with abnormal renal tract anatomy:</u> for 7 days	a. Confirm infection with MC&S and dipstick. b. Investigation of cause is commonly needed according to the age of the child. See NICE Clinical Guideline and local paediatric protocols. c. In babies up to 3 months , IV antibiotics are recommended – refer immediately. d. For children older than 3 months : use positive nitrite to start antibiotics. Send pre-treatment MSU for all. e. Imaging: only refer if child <6 months, recurrent or atypical UTI. f. Repeat samples may be useful if diagnosis is in doubt.
Upper UTI in children			
First line: Co-amoxiclav	Refer to Children's BNF .	For 7 - 10 days	Refer to the above help notes 'Lower UTI in children'.
Lower UTI in pregnancy			
First line: Nitrofurantoin <i>If eGFR ≥45 ml/min/1.73m²</i> MHRA Drug Safety Update <i>(Refer to help notes c and d)</i>	100mg modified-release capsules BD	For 7 days	<u>Investigation/treatment</u> a. If symptomatic : send MSU for culture and start empirical treatment. b. If asymptomatic : send a repeat urine sample to confirm result before initiating treatment. <u>Additional drug information</u> c. Short-term use of nitrofurantoin in pregnancy is unlikely to cause problems to the foetus. d. BNF states to avoid nitrofurantoin at term as it may induce neonatal haemolysis. e. Trimethoprim is a folate antagonist and there is a teratogenic risk in the first trimester of pregnancy; manufacturers advise avoid during pregnancy. Trimethoprim is not recommended in pregnancy if efficacious alternatives exist. However, prescribers are reminded that UTI / asymptomatic bacteriuria in pregnancy is a significant condition that also carries risks and if no other effective therapy exists, trimethoprim (off-label) should be considered. Trimethoprim after the first trimester is unlikely to cause harm. If prescribed in the first trimester, trimethoprim should be given with folic acid 5mg daily.
Second line: Cefalexin	500mg TDS	For 7 days	
Third line if proven susceptible by urine culture: Amoxicillin	500mg TDS	For 7 days	
PHE Infection Guidance in Primary Care states that short-term use of nitrofurantoin in pregnancy is unlikely to cause problems to the foetus. The PHE guidance quotes the National Teratology Information Service.			

Drug	Adult Dose	Duration	Help Notes
Lower UTI in pregnancy (Cont.)			
Fourth line if proven susceptible by urine culture and only after discussion with Microbiology Trimethoprim (off label) (refer to help note e)	200mg BD	For 7 days	<i>A number of retrospective reviews and case reports indicate that there is no increased risk of foetal toxicity following exposure to nitrofurantoin during pregnancy. Serious adverse reactions, e.g. peripheral neuropathy, sever hepatic damage and pulmonary fibrosis are extremely rare. Nitrofurantoin can cause haemolysis in patients with G6PD deficiency. Foetal erythrocytes have little reduced glutathione and there is a theoretical possibility that haemolysis may occur. However, haemolytic disease of the new born has not been reported following in utero exposure to nitrofurantoin.</i>
Higher UTI / Pyelonephritis in non-pregnant adults			
First line: Co-amoxiclav	625mg TDS	For 10-14 days	a. Definition: symptoms of higher UTI include high fever, loin pain, rigors, flank pain, nausea, vomiting and diarrhoea. Symptoms of cystitis may or may not be present. Symptoms develop rapidly over a few hours or a day. b. Always obtain an MSU for culture and susceptibility testing and start antibiotics. c. Avoid nitrofurantoin - insufficient activity. d. If no response within 24 hours or if septicaemia is suspected admit to hospital for intravenous (IV) therapy. e. In catheterised patients , avoid treatment, unless patient is systemically unwell or pyelonephritis likely. If clinically unwell, consider co-amoxiclav (or ciprofloxacin in patients with a penicillin allergy), and send urine for culture. Do not give prophylactic antibiotics for catheter changes unless history of catheter-change-associated UTI or trauma (NICE and SIGN guidance). Take sample if new onset of delirium, or two or more symptoms of UTI. MRSA in urine is difficult to treat - sensitivity results are essential. Do not treat CSU infections unless prior to surgery or as for help note d. f. If there is an ESBL risk and upon microbiology advice; consider IV antibiotics via outpatients (OPAT): Outpatient Parenteral Antimicrobial Treatment. g. Pregnant patients with pyelonephritis should be discussed with microbiology.
Second line or penicillin allergy: Ciprofloxacin (Refer to help notes h to j)	500mg BD	For 7 days	

Drug	Adult Dose	Duration	Help Notes							
Higher UTI / Pyelonephritis in non-pregnant adults (Cont.)										
		<p>Additional drug information</p> <p><u>Quinolones:</u></p> <ul style="list-style-type: none"> h. Risk of <i>C. difficile</i> disease with quinolones. Stop immediately if diarrhoea occurs. In patients at high risk of, or previous <i>C. difficile</i> disease use an alternative agent. i. Small increased risk of aortic aneurysm and dissection; advice for prescribing in high-risk patients (MHRA Drug Safety Update). j. Restrictions and precautions for use due to very rare reports of disabling and potentially long-lasting or irreversible side effects (MHRA Drug Safety Update). 								
Recurrent UTI (non-pregnant adults)										
<ul style="list-style-type: none"> • Give advice on self-care and vaginal oestrogens (<i>Refer to help notes c to f</i>). • Patients may be aware of UTI ‘triggers’, e.g. intercourse. A single dose of an antimicrobial post trigger may reduce the risk of subsequent UTI. • For patients with low-frequency recurrent UTI, e.g. every 3-4 months, consider issuing a standby prescription to take when symptoms arise. • In patients with more frequent UTI, long-term, continuous antibiotic prophylaxis may be considered if there are no reversible risk factors found after consultation in secondary care and self-care measures are ineffective. <p>The risks and benefits are summarised below:</p> <table border="1"> <thead> <tr> <th>Benefits of long-term continuous prophylaxis</th> <th>Risks of long-term continuous prophylaxis</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Significant reduction in UTI frequency (NNT=2-4 depending upon population studied). Benefit disappears upon stopping the antimicrobial.</td> <td>Direct antimicrobial toxicity, e.g. nitrofurantoin-induced hepatitis and pneumonitis</td> </tr> <tr> <td>Diarrhoea (affects 2-25% of patients; may cause <i>C. difficile</i> disease)</td> </tr> <tr> <td>Antimicrobial resistance</td> </tr> <tr> <td>Rash</td> </tr> </tbody> </table> <p>Choice of long-term antimicrobial agent Should be guided by urine culture and susceptibility results.</p>		Benefits of long-term continuous prophylaxis	Risks of long-term continuous prophylaxis	Significant reduction in UTI frequency (NNT=2-4 depending upon population studied). Benefit disappears upon stopping the antimicrobial.	Direct antimicrobial toxicity, e.g. nitrofurantoin-induced hepatitis and pneumonitis	Diarrhoea (affects 2-25% of patients; may cause <i>C. difficile</i> disease)	Antimicrobial resistance	Rash	<p>Referral</p> <p>a. Indications for referral (to Urology, Urogynaecology or Obstetrics): men, recurrent upper UTI, recurrent lower UTI when underlying cause unknown, pregnancy, suspected cancer.</p> <p>When to Discuss with Consultant Microbiologist</p> <ul style="list-style-type: none"> • Cases unsuitable for trimethoprim and nitrofurantoin. • Continuous prophylaxis choices in children aged <16 years (or discuss with a paediatrician). • All cases in which continuous prophylaxis is being considered in pregnancy. <p>Investigation/Treatment</p> <p>b. Definition (adult):</p> <p>≥2 culture-proven UTIs in a 6 month period</p> <p>OR</p> <p>≥3 culture-proven UTIs in a 12 month period</p> <p><i>(modified NICE guideline NG112 definition, October 2018)</i></p>	
Benefits of long-term continuous prophylaxis	Risks of long-term continuous prophylaxis									
Significant reduction in UTI frequency (NNT=2-4 depending upon population studied). Benefit disappears upon stopping the antimicrobial.	Direct antimicrobial toxicity, e.g. nitrofurantoin-induced hepatitis and pneumonitis									
	Diarrhoea (affects 2-25% of patients; may cause <i>C. difficile</i> disease)									
	Antimicrobial resistance									
	Rash									

Drug	Adult Dose	Cautions and Monitoring	Help Notes
Recurrent UTI (non-pregnant adults) (Cont.)			
Trimethoprim OR	100mg at night OR 200mg single dose when exposed to a trigger	<ul style="list-style-type: none"> • Hyperkalaemia: caution when prescribing with drugs such as spironolactone, ACE inhibitor or angiotensin inhibitors. • Renal impairment: discuss with renal physician if eGFR <30 ml/min/1.73m², refer to SPC advised dosing schedule. May increase serum creatinine. • Patients should be counselled on the risk of blood disorders and advised to seek attention if fever, sore throat, purpura, mouth ulcers, bruising or bleeding occurs. 	<ul style="list-style-type: none"> c. Self-care measures include avoiding dehydration, not delaying habitual or post-coital micturition, wiping from front to back post defecation, avoiding douching or wearing occlusive underwear. d. There is no strong evidence to support the recommendation of cranberry products. e. Non-pregnant women may wish to try D-mannose as a self-care treatment (can be bought OTC from a community pharmacy and/or health food store). f. Vaginal oestrogens significantly reduce the risk of recurrent UTI (NNT=2-4) in post-menopausal women but are associated with significant adverse events, e.g. breast tenderness and vaginal bleeding (NNH 5, range 3-11). Women should be counselled carefully to reach an informed decision. There is no evidence that one oestrogen preparation is superior to another. Topical oestrogens should never be prescribed for longer than 12 months without review. Recurrent UTI alone is NOT an indication for oral hormone replacement therapy (HRT). <p>Long-term prophylaxis</p> <ul style="list-style-type: none"> • It is strongly recommended that all patients on long-term, continuous prophylaxis are reviewed every 3-6 months. • There is little published evidence of patient outcome after >1 year of continuous prophylaxis. • Approximately 50% of patients receiving continuous long-term prophylaxis experience relapse after stopping. The inverse of this is that the remainder have long-term relief of symptoms. This may help counsel patients who experience side effects or wish to discontinue. A standby prescription may be provided to such patients in case they experience relapse.
Nitrofurantoin	100mg immediate release at night OR 100mg single dose when exposed to a trigger	<ul style="list-style-type: none"> • Renal impairment: avoid if eGFR <45 ml/min/1.73m² • Avoid if G6PD deficiency. • Use with caution in anaemia, diabetes, vitamin B or folate deficiencies. • Monitor full blood count, renal function and liver function tests every 3 months. • Advise the patient on the risk of pulmonary and hepatic fibrosis, and the symptoms to report if they develop during treatment. Reactions can develop acutely or insidiously. • Advise the patient on the risk of peripheral and optic neuropathy, and the symptoms to report if they develop during treatment. 	

CHAPTER 8: MISCELLANEOUS

Antimicrobial Prophylaxis: Infective Endocarditis

Antibacterial prophylaxis and chlorhexidine mouthwash are **NOT** routinely recommended for the prevention of endocarditis in patients undergoing dental procedures.

Antibacterial prophylaxis is **NOT routinely recommended** for the prevention of endocarditis in patients undergoing procedures of the:

- Upper and lower respiratory tract (including ear, nose, throat procedures and bronchoscopy)
- Genito-urinary tract (including urological, gynaecological, and obstetric procedures)
- Upper and lower gastro-intestinal tract.

See BNF and NICE Clinical Guideline for further details.

Antimicrobial Prophylaxis: Malaria

Malaria prophylaxis should **NOT** be prescribed on an NHS prescription form. Patients should be advised to purchase their medicines from a pharmacy.

Mefloquine, doxycycline and malarone are 'prescription only medicines' which should be provided on private prescription for malaria prophylaxis. GPs may charge patients for the prescribing or providing of drugs for malaria prophylaxis for travel abroad.

- Local community pharmacists have access to up to date advice about appropriate regimes and can advise travellers accordingly.
- Regular GP literature also provides updated advice on the choice of antimalarials for different regions of the world. Clinical Knowledge Summaries gives detailed practical advice on [malaria prophylaxis](#).
- The updated guidelines for malaria prevention are also available on:
 - <https://travelhealthpro.org.uk/>
 - www.travax.scot.nhs.uk (subscription needed)
- Alternatively, the following telephone advice lines may be used:
 - Consultant in Infectious Diseases, Worcester Royal Hospital (see useful contact numbers on page 65)
 - Liverpool School of Tropical Medicine: 0151 705 3100 www.liv.ac.uk/lstm
 - Birmingham Heartlands Hospital – Malaria Helpline: Switchboard 0121 424 2000

Prophylactic medicines do **not** provide absolute protection against malaria. **Personal protection against being bitten using mosquito nets, insect repellents (containing DEET) and appropriate clothing** is also important.

Antimicrobial Prophylaxis: Malaria (Cont.)

In any case of suspected malaria in a returning traveller:

- Take 3 thick blood films, send EDTA blood sample to haematology for malaria screening.
- Contact Consultant in Infectious Diseases, Worcester Royal Hospital (see useful contact numbers on page 65)

Inoculation Incidents

Refer to the Infection Control Policy for full protocol and supporting documentation available on the Worcestershire Health Services Website [Blood Borne Contamination Incident \(Appendix I\)](#) infection control services / policies and procedures / blood borne contamination incident policy – appendix i.

1. First aid to wound; encourage bleeding of puncture site under running water.
2. Make risk assessment (e.g. greater risk if hollow bore needle containing blood, from source at high risk of blood borne virus infection).
3. If at all possible, obtain blood from source, and consent for testing for Hepatitis B and C, and HIV.
4. Take blood from victim for storage.
5. If high risk of HIV infection, contact medical microbiologist urgently to discuss post-exposure prophylaxis.
6. Ascertain Hepatitis B immune status of the victim. Most health care workers will have been immunised and should be aware of their status.
7. If not previously vaccinated, give first dose of Hepatitis B vaccine promptly, with arrangement made to give follow-up doses. Refer to '[Immunisation against infectious disease](#)' (Green Book) for further details of accelerated schedules. If incident high risk for Hepatitis B acquisition, arrange to administer Hepatitis B immunoglobulin.
8. If vaccine non-responder, and high risk of Hepatitis B, contact microbiologist for advice regarding Hepatitis B specific immunoglobulin.
9. If source blood unknown, or known to be Hepatitis C positive, ensure victim understands that they need to return for hepatitis C PCR testing at 6 weeks post-incident and follow-up serology at 3 months.

Antimicrobial Prophylaxis: Meningitis

For all suspected and confirmed cases: consult Public Health England for advice and recommendations on dose – refer page 66 of guideline for contact numbers.

Transfer all patients to hospital immediately. If time before admission, give IV benzylpenicillin or cefotaxime, unless hypersensitive; i.e. history of difficulty breathing, collapse, loss of consciousness, or rash. Risk benefit assessment may allow cefotaxime to be given even with a history of penicillin allergy and certainly with a history of rash alone. Give IM if vein cannot be found.

Antimicrobial Prophylaxis: Meningitis (Cont.)			
Benzylpenicillin:		Cefotaxime:	
Adults and children aged 10 years and over	1.2g STAT IV/IM	Adults and children aged 12 years and over	1gram STAT IV/IM
Children aged 1-9 years	600mg STAT IV/IM	Children aged 1 month - 11 years	50mg/kg STAT IV/IM
Children aged under 1	300mg STAT IV/IM		
Chemoprophylaxis for close contacts (only when advised by PHE) – see help notes for further information			
Ciprofloxacin – recommended for use in all age groups and in pregnancy			
Adults and children aged 12 years and over		500mg by mouth as a single dose	
Children aged 5 to 11 years		250mg by mouth as a single dose	
Children under 5 years		30mg/kg up to maximum 125mg by mouth as a single dose	
Rifampicin – recommended for use in all age groups			
Adults and children aged 12 years and over		600mg by mouth every twelve hours for 2 days	
Children aged 1 to 11 years		10mg /kg (maximum 600mg) by mouth every twelve hours for 2 days	
Infants under 12 months of age		5mg/kg by mouth every twelve hours for 2 days	
Common Pathogen			
Bacterial Meningitis: <i>N. meningitidis</i> is the commonest. Others include <i>H. influenzae</i> , <i>S. pneumoniae</i> .			
Viral Meningitis: Herpes simplex virus, enterovirus, adenovirus.			
Help Notes			
<ol style="list-style-type: none"> The most important course of action a GP can take in the event of a suspected case of meningococcal infection is to arrange an emergency hospital admission by ambulance. Parenteral preadmission antibiotics may also be indicated. Meningococcal meningitis and septicaemia are statutorily notifiable diseases: suspected cases are to be reported to the local Health Protection Team. Identification of contacts will be carried out by Public Health England, although the supply of chemoprophylaxis may be through GPs or hospital clinicians following advice from PHE. Ciprofloxacin has a number of advantages over rifampicin because it is given as a single dose, does not interact with oral contraceptives, and is more readily available in community pharmacies. Ciprofloxacin is licensed in children over 1 year of age for specific indications, although not for meningitis prophylaxis in any age group. However, national guidance now advocates its use in all ages for this indication. Contact tracing should only include those individuals who have had prolonged close contact with the patient in a household type setting during the seven days before onset of illness. Examples of such contacts would be those living and/or sleeping in the same household, pupils in the same dormitory, boy/girlfriends, or university students sharing a kitchen in a hall of residence. Discuss with Public Health England regarding future vaccinations of index cases and contacts. 			

Antimicrobial Prophylaxis: Meningitis (Cont.)

Clinical Details

1. *N. meningitidis* is a normal commensal nasopharyngeal bacterium, with a carriage prevalence of approximately 25% within the 15-19 year old age group.
2. Annual rates of invasive disease leading to meningitis and/or septicaemia are approximately 2-6/100,000, with a mortality rate of 10%.
3. Factors associated with an increased risk of invasive disease include; young age (the highest rates are in infants and young children, with a secondary peak in adolescence and early adulthood); passive smoking; overcrowded living conditions; recent infection with influenza A.
4. For further advice, see the Public Health England website; reference: [Guidance for public health management of meningococcal disease](#).

Sepsis

A medical emergency – refer to Medical Admissions Unit and inform admitting team.

Refer to section on sepsis management in General Practice and to the UK Sepsis Trust screen and action tool for General Practice: pages 6 to 7 of guidance for further information and link to references.

Splenectomy and Infection

Patients without a spleen are at increased risk of some types of infection, notably pneumococcal infection, and disease caused by *H. influenzae* type b and *N. meningitidis*. They are also at increased risk from some tropical diseases including malaria.

Summary of advice

Vaccination:

All patients without spleens should be offered pneumococcal, Hib, MenB and MenC vaccines and Meningococcal ACWY conjugate vaccine. Booster doses of pneumococcal vaccine are required every 5 years without checking titres. Annual influenza vaccine should also be offered.

Refer to Green Book: Immunisation of individuals with underlying conditions for further information and links to full age-related vaccination advice. Reference: [Green Book Chapter 7](#)

Antibiotic prophylaxis:

Adults and children aged over 5 years	Phenoxymethylpenicillin 250mg BD
Children aged 1 to 5 years	Phenoxymethylpenicillin 125mg BD
Children aged under 1	Phenoxymethylpenicillin 62.5mg BD

Splenectomy and Infection (Cont.)**If penicillin allergic:**

Adults (not in pregnancy)	Clarithromycin 250mg BD
Children aged 8 to 18 years	Erythromycin 500mg BD
Children aged 2 to 8 years	Erythromycin 250mg BD
Children aged 1 month to 2 years	Erythromycin 125mg BD
Pregnant	Erythromycin 500mg BD

The risk of infection is greatest in childhood, and in the first 2 years post-splenectomy. However, the risk is lifelong, and high enough to justify taking prophylaxis daily for life.

ADDITIONAL INFORMATION

Location of HIV Prophylaxis Packs	
<ul style="list-style-type: none"> • A&E Department and the Arrowside Unit at Alexandra Hospital (Alex), Redditch • A&E Department and Emergency Drug Cupboard at Worcester Royal Hospital (WRH) • A&E Department at Wye Valley NHS Trust (WVT), Hereford • Hereford Sexual Assault Referral Centre • John Anthony Centre, Worcester • Malvern Community Hospital • Minor Injuries Units at the following Community Hospitals: Evesham, Kidderminster, Tenbury and Princess of Wales Hospital (Bromsgrove) 	
Location of Meningitis Chemoprophylaxis Packs	
Ciprofloxacin tablets and rifampicin oral suspension: <ul style="list-style-type: none"> • Emergency Drug Cupboard at Alex, Redditch • A&E Department and Emergency Drug Cupboard at WRH • Pharmacy Department at WVT, Hereford (ciprofloxacin only) 	
Useful Contact Numbers	
Current Parasite Policy:	Public Health England*: 0344 2253560 – select option 2
HIV /AIDS, Blood Borne Viruses, Travel-Related Infections:	<ul style="list-style-type: none"> • Dr M. Ling, Consultant in Infectious Diseases, WRH: WRH switchboard 01905 763333 • Dr M. Roberts, Consultant in Infectious Diseases: 01562 513072 or WRH ext. 53436 or WRH switchboard 01905 763333 • Non urgent queries: wah-tr.idreferrals@nhs.net
Infection Prevention and Control (Primary Care):	Based at Evesham Community Hospital: 01386 502552 Based at WVT: 01432 355444 ext. 5133 email infection.prevention@wvt.nhs.uk
Meningococcal Meningitis and Whooping Cough:	Public Health England*: 0344 2253560 – select option 2

Useful Contact Numbers (Cont.)		
Multi-Disciplinary Footcare Team	<ul style="list-style-type: none"> Tel: 0300 123 3659 Email: whcnhs.worcestershiremdft@nhs.net 	
Microbiological Advice and Needle-stick Injury:	<ul style="list-style-type: none"> Dr M. Ashcroft Dr T. Gee Dr H. Morton Dr E. Yates 	WRH: switchboard 01905 763333 or ext. 30661
	<ul style="list-style-type: none"> Dr A. Johnson Dr V. Sivapakrasam 	WVT: 01432 355444 ext. 5717 / 5724 consmicro.advicewvt@nhs.net (During working hours contact - Medical Microbiology Consultant at WVT: 01432 277117)
	<ul style="list-style-type: none"> Department of Microbiology and Immunology at Hereford County Hospital 	01432 277117 Or out of hours 01432 355444
Pharmacy Department	<ul style="list-style-type: none"> Alex (Redditch): switchboard 01527 503030 or ext. 44804 WRH (Worcester): switchboard 01905 763333 or ext. 39221 WVT (Hereford): 01432 355 444 ext. 4016. (Out of hours, bleep via switchboard) 	
Public Health England (West Midlands):	Public Health England*: 0344 2253560 – select option 2	
Sexual Health Clinics	<ul style="list-style-type: none"> Arrowside Unit, Alexandra Hospital Site, Woodrow Drive, Redditch, Worcestershire B98 7UB Tel: 01527 516398 John Anthony Centre, Newtown Road, Worcester, WR5 1JF Tel: 0300 123 1731 Kidderminster Sexual Health, Bromsgrove Street, Kidderminster, Worcestershire DY10 1PG Solutions for health, 15 St Owen Street, Hereford HR1 2JB Tel: 01432 483693 Herefordshire Consultant/Director, Sexual Health Service Tel: 0800 7720478 	

*Public Health England (formerly the Health Protection Agency)

Tuberculosis:	<ul style="list-style-type: none"> • Dr D. Brocklebank • Dr A. Lal 	Alex: 01527 503881 or Alex ext. 44213 or Alex switchboard 01527 503030
	<ul style="list-style-type: none"> • Dr S. Deacon 	WRH: 01905 733778 or WRH switchboard 01905 763333 or ext. 33989
	<ul style="list-style-type: none"> • Dr P. Ryan • Kate Birchall (Respiratory Specialist Nurse) 	WVT: 01432 355444 ext. 4096 or Phil.ryan@wvt.nhs.uk WVT: 01432 355444 ext. 4416 or kate.birchall@wvt.nhs.uk

CHAPTER 9: REFERENCES

The following publications were used in the preparation of this document:

- Summary of antimicrobial prescribing guidance – managing common infection
<https://www.nice.org.uk/Media/Default/About/what-we-do/NICE-guidance/antimicrobial%20guidance/summary-antimicrobial-prescribing-guidance.pdf>
- British Association for Sexual Health and HIV (BASHH):
www.bashh.org
- British National Formulary (BNF) 2019:
<https://bnf.nice.org.uk/>
- BNF for Children 2019
<https://bnfc.nice.org.uk/>

- Clinical Knowledge Summaries (CKS)
<https://cks.nice.org.uk/#?char=A>
- Immunisation against Infectious Disease:
<https://www.gov.uk/government/collections/immunisation-against-infectious-disease-the-green-book>
- National Institute for Health and Clinical Excellence (NICE)
www.nice.org.uk
- Scottish Intercollegiate Guidelines Network (SIGN)
www.sign.ac.uk
- Summary of Product Characteristics
www.medicines.org.uk

CHAPTER 10: ACKNOWLEDGMENTS

Sumit Bhaduri: Consultant in Genito-urinary Medicine, WHCT

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Carole Clive: Nurse Consultant in Infection Prevention and Control, WHCT

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