South Central Antimicrobial Network

Guidelines for **Antibiotic Prescribing** in the Community **2018**

NHS
North Hampshire
Clinical Commissioning Group

Adapted from the Public Health England (PHE) and British Infection Association Management of Infection Guidance for Primary Care by the South Central Antimicrobial Network Group (SCAN)

In conjunction with all WESSEX CCGs, Berkshire East, Berkshire West, Surrey Heath, Coastal West Sussex and Oxfordshire CCG

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Foreword

These guidelines are intended to provide advice on the effective and safe treatment of infections commonly presenting in primary care (doses are for adults unless otherwise stated) in mainly **Wessex**, but also **Surrey Heath, Berkshire East and West** and **Coastal West Sussex and Oxfordshire CCG**. The guidelines also promote the use of narrow-spectrum antibiotics in preference to broad-spectrum antibiotics where safe and appropriate. The audience of users is anticipated to be general practitioners, GP trainees, GP practice nurses, non-medical prescribers, paramedics, hospital emergency department staff and community pharmacists.

These guidelines were drafted by a multi-disciplinary group of health professionals with an interest in infection from around the region. The 2017 update was led by pharmacists from the South Central Antimicrobial Network group in close partnership with consultant medical microbiologists from local hospitals – a list of stakeholders is available below. The draft guidelines were published for consultation in December 2017 and feedback was received from a number of GPs, consultant medical microbiologists and pharmacists, before the final guidelines were published in February 2018.The guidelines have been updated from the previous version, published in 2014, taking into consideration feedback from users, emerging evidence and changing epidemiology of antimicrobial resistance. The guidelines are based largely on the Management of Infection Guidance for Primary Care, published jointly by the Health Protection Agency and the British Infection Association, updated in November 2017, and the guideline development group gratefully acknowledges the work of Dr Cliodna McNulty, Sarah Alton and her colleagues in the PHE and BIA.

Recommendations for when antimicrobial treatment is indicated, based upon cited national or international evidence-based guidelines, have been expanded from the PHE/BIA Guidance, along with recommendations and practical advice for taking specimens for microbiological investigations and interpreting culture and sensitivity laboratory reports. Clinically relevant information on cautions and warnings associated with antimicrobial treatment has also been expanded from the PHE/BIA Guidance including information about risk of *Clostridium difficile* infection. All statements were fully referenced.

This updated version of the guidelines has been developed during 2017 and the next update will be scheduled for review in November 2019. This version also includes new areas not previously covered and hopefully will be useful.

Comments and feedback are welcome; please e-mail ***ruth.ellenby@nhs.net***.

Reference

Shaneyfelt TM, Mayo-Smith MF & Rothwangl J. Are Guidelines Following Guidelines?
The Methodological Quality of Clinical Practice Guidelines in the Peer-Reviewed Medical Literature. JAMA. 1999; 281: 1900-1905.

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With special acknowledgments to **Liz DMoch** and **Carys Jones** for their help in formatting and evidence sourcing, and **Kieran Hand** for his support.

Aims

- To provide a simple, effective, economical and empirical approach to the management and treatment of common infections.
- To minimise the emergence of antimicrobial resistance in the community.

Principles of Treatment (PHE/BIA)

1. This guidance is based on the best available evidence, but use professional judgement and involve patients in management decisions.
2. This guidance should not be used in isolation; it should be supported with patient information about safety netting, delayed/back-up antibiotics, self-care, infection severity and usual duration, clinical staff education, and audits. Materials are available on the RCGP TARGET website.
3. Prescribe an antibiotic only when there is likely to be clear clinical benefit, giving alternative, non-antibiotic self-care advice, where appropriate.
4. Consider a 'no' or 'delayed/back-up' antibiotic strategy for acute self-limiting upper respiratory tract infections and mild UTI symptoms.
5. In severe infection, or immunocompromised, it is important to initiate antibiotics as soon as possible, particularly if sepsis is suspected. If patient is not at moderate to high risk for sepsis, give information about symptom monitoring, and how to access medical care if they are concerned.
6. Where an empirical therapy has failed or special circumstances exist, microbiological advice can be obtained from the local microbiology laboratory
7. Limit prescribing over the telephone to exceptional cases.
8. Use simple, generic antibiotics if possible. Avoid broad spectrum antibiotics (e.g. co-amoxiclav, quinolones and cephalosporins) when narrow spectrum antibiotics remain effective, as they increase the risk of *Clostridium difficile* infection, MRSA and resistant UTIs.
9. Always check for antibiotic allergies. A dose and duration of treatment for adults is usually suggested, but may need modification for age, weight, renal function, or if immunocompromised. In severe or recurrent cases, consider a larger dose or longer course.

Continued overleaf

10. Child doses are provided when appropriate, and can be accessed through the **J** symbol.
11. Refer to the BNF for further dosing and interaction information (e.g. the interaction between macrolides and statins), and check for hypersensitivity.
12. Have a lower threshold for antibiotics in immunocompromised, or in those with multiple morbidities; consider culture/ specimens for seeking advice.
13. Avoid widespread use of topical antibiotics, especially in those agents also available as systemic preparations (e.g. fusidic acid).
14. In pregnancy, take specimens to inform treatment. Where possible, avoid tetracyclines, aminoglycosides, quinolones, azithromycin, clarithromycin, and high dose metronidazole (2g stat), unless the benefits outweigh the risks. Penicillins, cephalosporins, and erythromycin are safe in pregnancy. Short-term use of nitrofurantoin is not expected to cause foetal problems (theoretical risk of neonatal haemolysis). Trimethoprim is also unlikely to cause problems unless poor dietary folate intake, or taking another folate antagonist.
15. This guidance is developed alongside the NHS England Antibiotic Quality Premium. The required performance in 2017/19 is: a 10% reduction (or greater) in the number of E. coli blood stream infections across the whole health economy; a 10% reduction (or greater) in the trimethoprim: nitrofurantoin prescribing ratio for UTI in primary care, and a 10% reduction (or greater) in the number of trimethoprim items prescribed to patients aged 70 years or greater; sustained reduction of inappropriate prescribing in primary care.

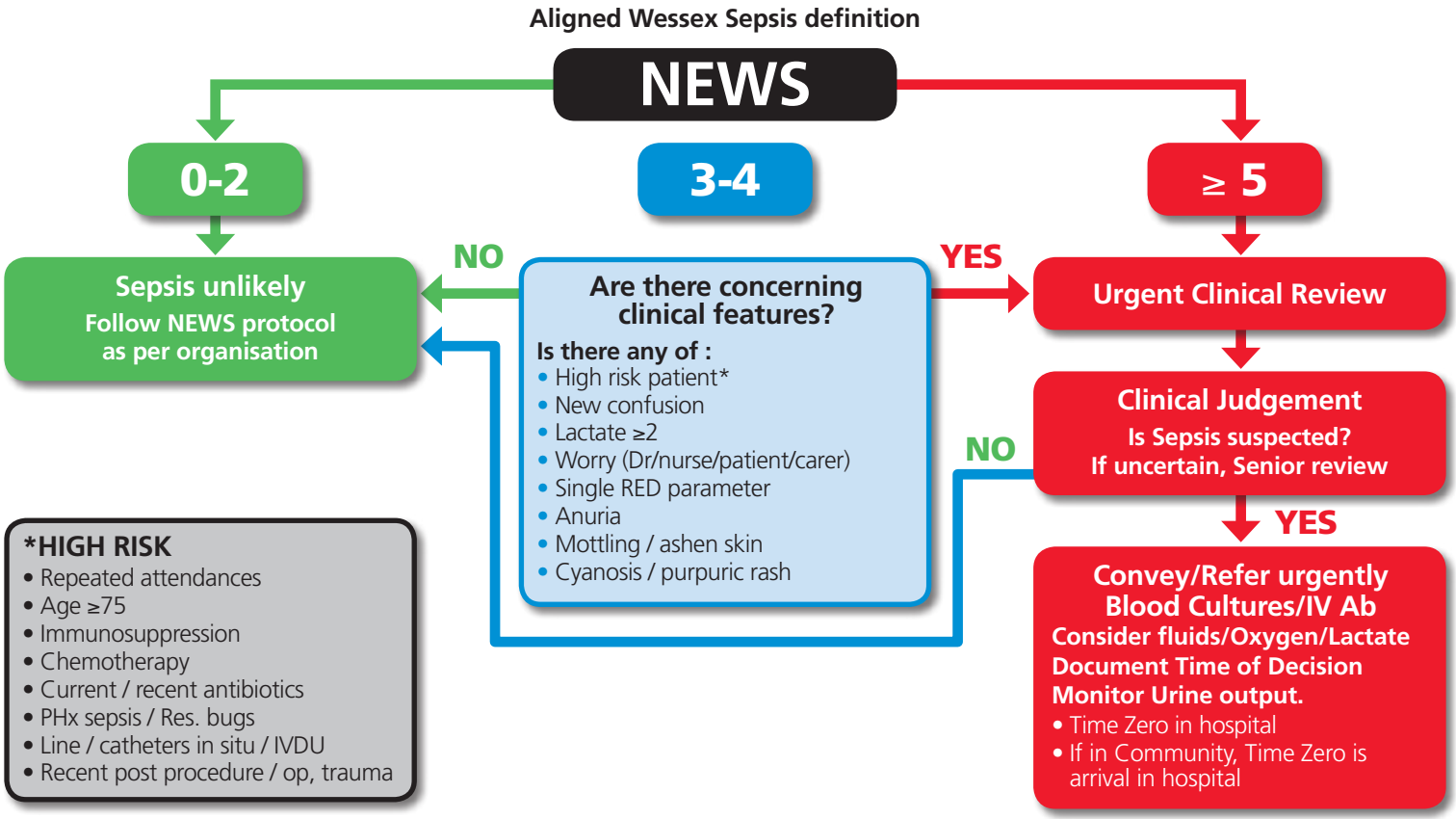
Risk assessment

	Risk of *Clostridium difficile* infection	Risk of antibiotic treatment failure
Patient	Older patients (over 65yr) & antibiotic exposure within previous 2 months	History of infection with resistant microorganism. Recent antibiotic exposure. Immunocompromised.
Environment	Contact with patients with *Clostridium difficile* or recent hospital admission	Infection acquired in healthcare environment
Action	Withhold antibiotics if safe to do so (watchful waiting). Avoid high risk antibiotics (the 4 Cs): • Cephalosporins • Ciprofloxacin & quinolones • Co-amoxiclav • Clindamycin	Consider second-line antibiotics from the following tables

Evidence Grading

Study design	Recommendation grade
Good recent systematic review of studies	A+
One or more rigorous studies, not combined	A
One or more prospective studies	B+
One or more retrospective studies	B-
Formal combination of expert opinion	C
Informal opinion, other information	D

Sepsis Screening and Action Tool



www.rcplondon.ac.uk/projects/outputs/national-early-warning-score-news-2

Ear, Nose and **Throat** Infections

EN&T

Ear, Nose and Throat Infections – Acute Sore Throat (Patient Information Leaflet available from *TARGET*)

FOR PAEDIATRIC GUIDELINES see page 86

When to treat[1,2]

Avoid antibiotics as 82% resolve in 7 days without, and pain only reduced by 16 hours.[1] Average total length of illness is one week.[1,2] Complications are rare: acute otitis media, acute sinusitis and quinsy.[1] Antibiotics to prevent otitis media NNT 200.[1,2] Those most likely to benefit from an antibiotic: see attached sore throat clinical scoring system **(FeverPain)**. Advise **paracetamol or ibuprofen, self-care and safety net**.

If Fever Score 4 or more: offer immediate antibiotics if severe or offer a delayed prescription.

If Fever score 2 or 3: consider 2 or 3-day delayed antibiotics.[1]
Or if systemically very unwell (see cautions below) or has symptoms and signs of a more serious illness or condition, or has high risk of complications.

When to investigate[3]

Throat swabs or rapid antigen tests should not be carried out routinely in the investigation of acute sore throat.[2,3] Suspect glandular fever in a person with a sore throat that fails to improve, or becomes worse, after several days.[3]

Treatment choices[1]

First line:
Phenoxymethylpenicillin[B] 500mg *qds* ***OR*** 1g *bd*[A+] for 7 days[5A-]
(a bd dosing is as effective as a tds or qds dosing, if total daily dose remains the same, and may be more convenient)[6]

If allergic to penicillin:
Clarithromycin 250-500mg *bd* for 5 days[A+]
If allergic to penicillin and pregnant:
Erythromycin 500mg *qds* or 1g bd for 5 days[A+]

Prescribing amoxicillin or ampicillin will produce a generalized, itchy maculopapular rash in over 90% of people with glandular fever.[3]

Cautions[3]

Admit immediately anyone who has:

- Stridor or respiratory difficulty.
- Respiratory distress, drooling, systemically very unwell, painful swallowing, muffled voice: suspect acute epiglottitis. Do not examine the throat of anyone who has suspected epiglottitis.
- Upper airway obstruction.
- Dehydration or reluctance to take any fluids.
- Severe suppurative complications (e.g. peri-tonsillar abscess or cellulitis, parapharyngeal abscess, retropharyngeal abscess, or Lemierre syndrome) as there is a risk of airway compromise or rupture of the abscess.
- Signs of being markedly systemically unwell and is at risk of immunosuppression.
- Suspected Kawasaki disease, diphtheria yersinial pharyngitis, or profoundly unwell with cause unknown or rare cause suspected, e.g. Stevens-Johnson syndrome

Evidence

Studies involving clarithromycin and erythromycin used a 5 day course, whereas studies involving phenoxymethylpenicillin used a 10 day course. Based on evidence, clinical experience and resistance data 5-10-day courses of phenoxymethylpenicillin was needed.[1] Evidence suggests the use of broader spectrum antibiotics will drive the emergence of bacterial resistance; kills normal commensal flora leaving people susceptible to *Clostridium difficile* associated disease.[1]

- No statistically significant reduction in acute glomerulonephritis in people taking antibiotics.[1]

Rheumatic fever was reported only in RCTs published before 1961, results from these low quality studies found antibiotics reduced acute rheumatic fever by more than two thirds compared with placebo.[1]

References

1. NICE Sore throat (acute): antimicrobial prescribing [NG84 January 2018] **https://www.nice.org.uk/guidance/ng84/chapter/terms-used-in-the-guideline** Date accessed May 2018
2. NICE. National Institute for Health and Clinical Excellence. Prescribing of antibiotics for self-limiting respiratory tract infections in adults and children in primary care. 2008. (Clinical guideline 69) **http://guidance.nice.org.uk/CG69** Date accessed May 2018
3. NICE CKS Sore Throat – **Acute Sore throat - acute - NICE CKS** Date accessed May 2018
4. BNF **https://www.medicinescomplete.com/#/browse/bnf** Date accessed May 2018
5. Influence of the duration of penicillin prescriptions on outcomes for acute sore throat in adults: the DESCARTE prospective cohort study in UK general practice **http://bjgp.org/content/early/2017/08/14/bjgp17X692333** Date accessed May 2018
6. Review: twice daily dosing of penicillin V is as effective as more frequent dosing for streptococcal tonsillopharyngitis **http://ebm.bmj.com/content/5/6/168** Date accessed May 2018

Sore Throat Clinical Scoring System (FeverPAIN) to predict streptococcal infection[1,2]

Inclusion criteria: patients aged 3 years and over presenting to English primary care clinicians with an acute (<2 weeks) sore throat.
Note: average total length of illness is 1 week.

FeverPAIN – one point each for:

- **F**ever during the last 24 hours
- **P**urulence on tonsils
- **A**ttend rapidly (short prior illness duration of 3 days or less)
- **I**nflamed (severely) tonsils
- **N**o cough or coryza ('runny nose')

Suggested actions:

- **Score 0-1:** 13-18% streptococci – no antibiotic.[a]
- **Score 2-3:** 34-40% streptococci – 3-day delayed antibiotic.[b]
- **Score 4-5:** 62-65% streptococci – if severe, immediate antibiotic, or 48-hour delayed antibiotic

*% likelihood of isolating streptococcus.

[a] Approximately one third of patients in the original study population had a FeverPAIN score of ≤ 1.

[b] A prescription was prepared and left in reception, with advice to the patient to collect the prescription after 3-5 days if symptoms were not starting to settle or were getting considerably worse.

This strategy is expected to reduce antibiotic use in this setting by 29%.

Reference List

- Little P, Hobbs FD, Moore M, Mant D, Williamson I, McNulty C et al. Clinical score and rapid antigen detection test to guide antibiotic use for sore throats: randomised controlled trial of PRISM (primary care streptococcal management). BMJ 2013; 347:f5806.
- Little P, Moore M, Hobbs FD, Mant D, McNulty C, Williamson I et al. PRImary care Streptococcal Management (PRISM) study: identifying clinical variables associated with Lancefield group A beta-haemolytic streptococci and Lancefield non-Group A streptococcal throat infections from two cohorts of patients presenting with an acute sore throat. BMJ Open 2013; 3(10):e003943.
- Little P, Stuart B, Hobbs FD, Butler CC, Hay AD, Delaney B et al. Antibiotic prescription strategies for acute sore throat: a prospective observational cohort study. Lancet Infect Dis 2014; 14(3):213-219.

Ear, Nose and Throat Infections – Acute Otitis Media (AOM) (Patient Information Leaflet available from *TARGET*)

FOR PAEDIATRIC GUIDELINES see page 85

When to treat[1]	**Optimise analgesia and target antibiotics.**[1B-] AOM resolves in 60% within 24h without antibiotics, which only reduce pain at 2 days (NNT15) and do not prevent deafness.[1A+] Consider 2 or 3-day delayed, or immediate antibiotics for pain relief • All ages with otorrhoea NNT3. Antibiotics to prevent mastoiditis NNT>4000[1B-]		
When to investigate[3]	Routine follow-up is not required in the absence of persistent symptoms.[2]		
General advice	Average total length of illness is 4 days.[3]		
Treatment choices[1]	**First-line: Amoxicillin**[A+] 500mg *tds*[2]	***If allergic to penicillin:* Clarithromycin**[D] for 5 days[A+] 250mg *bd* (double in severe infection)[2]	**or Erythromycin** for 5 days 250-500mg *qds*
Cautions[3]	**Admission or immediate referral if:** suspected acute complications of (AOM), such as meningitis, mastoiditis, or facial paralysis **Elective referral if:** Persistent effusion or discharge, perforation not healed after 6 weeks, 3 or more episodes in 6 months or impaired hearing after 3 to 6 months, 4 or more episodes in previous 12 months with at least 1 in the past 6 months.[2]		
Evidence	Amoxicillin is as effective as other antibiotics in the treatment of AOM in RCTs.[1] Macrolides concentrate intracellularly and so are less active than penicillin against the extracellular H influenzae.[D2] No advantage in using an antibiotic to cover beta-lactamase resistant organisms (e.g. co-amoxiclav) in the initial treatment of AOM. This should be reserved for persistent acute otitis media.[2]		
References	1. Management of Infection Guidance for Primary Care, PHE Endorsed by RCGP & BIA, January 2017 **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Accessed Dec 2017 2. NICE Clinical Knowledge Summary, Otitis media – acute. **https://cks.nice.org.uk/otitis-media-acute** Accessed February 2017. 3. NICE Clinical guideline 69, July 2008. Prescribing of antibiotics for self-limiting respiratory tract infections in adults and children in primary care. **https://www.nice.org.uk/guidance/cg69**		

Ear, Nose and Throat Infections – Acute Otitis Externa

FOR PAEDIATRIC GUIDELINES see page 84

When to treat[1]	First use analgesia for pain relief, and apply localised heat. Similar cure at 7 days for topical acetic acid or topical antibiotic +/- steroid. If cellulitis or disease extends outside ear canal, or there are systemic signs of infection, start oral antibiotics and refer to exclude malignant otitis externa, if necessary.[1]	
When to investigate[2]	If the treatment strategy fails, consider taking an ear swab for causative organism if: otitis externa is recurrent or chronic, topical treatment cannot be delivered effectively, infection spread, or the condition is severe enough to require oral antibiotics. A swab is best taken from the medial aspect of the ear canal to reduce contamination.	
How to respond to a positive lab report[2]	Reported bacterial susceptibility may not correlate with clinical outcomes because sensitivities are determined for systemic (not topical) administration. Also, higher concentrations of antibiotic can be achieved with topical application. It is not possible to tell from the culture results whether the isolated organisms are causing the disease or are merely contaminants and there is also likely to be a fungal overgrowth after using antibacterial drops.	
Treatment choices[1]	**First use analgesia for pain relief and apply localised heat**	
	First-line: ear drops / spray Acetic acid (EarCalm spray®) 2% one spray *tds* for 7 days.[1,2]	**Or** ear drops / spray **Neomycin + steroid** three drops tds for 7-14 days.[1, A,D,2]
	Oral antibiotics are rarely indicated[2] **2nd line:** **Flucloxacillin** (adult dose) 250-500mg *qds* for **7** days[1,2] **Ciprofloxacin** may be needed in pseudomonal infections which may occur if the patient has diabetes or is immunocompromised.[3]	**If Penicillin allergic:** **Clarithromycin** (adult dose) 250mg *bd* for **7** days[2,3]
Cautions[2]	Adverse effects to consider include aminoglycoside-induced ototoxicity in people with a perforated tympanic membrane, aminoglycoside induced skin sensitization, and fungal superinfection (particularly with longer treatments).	
Evidence	Acetic acid was as effective and comparable to antibiotic/steroid for the first 7 days, but inferior after this point.[1] It is important to instruct patients to use drops for at least one week, and to continue for up to 14 days if symptoms persist. The oral antibiotics in the trials were often inactive against *P. aeruginosa* (incidence 45%) and *S. aureus* (incidence 9%).[1] Topical antibiotics such as neomycin have a broader spectrum of activity. When using topical antibiotics in the ear bacterial resistance is less of a concern as the high local concentration of the drug will generally eradicate all susceptible organisms, plus those with marginal resistance.[1]	
References	1. Management of Infection Guidance for Primary Care, PHE. Endorsed by RCGP & BIA, July 2017 **https://www.gov.uk/government/publications/managing-common-infections-guidance-for-primary-care** (Accessed July 2017) 2. NICE CKS Otitis Externa **http://cks.nice.org.uk/otitis-externa** (Accessed August 2017) 3. BNF 74 September 2017	

Ear, Nose and Throat Infections – Acute Rhinosinusitis (Patient Information Leaflet available from *TARGET*)

FOR PAEDIATRIC GUIDELINES see page 83

When to treat

Avoid antibiotics as 80% resolve in 14 days without, and they only offer marginal benefit after 7 days (NNT15).[1,2A+] Only about 2% of cases are complicated with bacterial infection (however these can be hard to distinguish).[3] NICE states average duration of symptoms of acute sinusitis is 2-3 weeks [3] A systematic review analysed the placebo arms of several randomized controlled trials (RCTs), and found that, after 7-15 days, 73% of people taking placebos experienced some improvement in their symptoms, and 30% had complete recovery.[3]
Use adequate analgesia.[1,2B+]

For patients with symptoms of less than 10 days[3]
Do not offer an antibiotic prescription. Give advice on course of acute sinusitis (2-3 weeks), managing symptoms with self-care and seeking help if symptoms deteriorate rapidly or significantly, do not improve after 3 weeks or they become systemically unwell.

For patients with symptoms of around 10 days or more with no improvement.[1,3]
Consider high dose nasal corticosteroid for 14 days in adults and children over 12 years (may improve symptoms but not affect length of course of illness). Caution for side effects especially in patients receiving other corticosteroids
Consider No or delayed antibiotic prescription (with advice as to when to use the prescription and evidence that antibiotics make little difference to symptom course length and can cause side effects) if several of: purulent nasal discharge, severe localised unilateral pain, fever, marked deterioration after initial milder phase.
Consider an immediate antibiotic prescription[3] only if it is not appropriate to admit the person and they are:[3]

- Systemically unwell, or at high risk of complications because of a pre-existing comorbidity.

Recommend measures to relieve symptoms, such as analgesia for pain or fever, an intranasal decongestant, irrigation of the nose with normal saline solution, application of warm face packs, drinking adequate fluids, and rest.

When to investigate

Investigations are not required in primary care because nasal swabs for culture have a poor diagnostic yield and are frequently contaminated (or bacteria found are commensal).[3] Acute sinusitis usually follows a common cold, and is defined as an increase in symptoms after 5 days, or persistence of symptoms beyond 10 days, but less than 12 weeks.

Treatment choices[1]

First-line for delayed: **Penicillin**[1A+] 500mg *qds* (or 1g *bd*) for 5 days[1A-]
If penicillin allergic or intolerant: **Doxycycline**[1] 200mg stat then 100mg *od* for 5 days **OR Clarithromycin**[1A] 500mg *bd* for 5 days
Self-care: paracetamol or ibuprofen for pain/fever[1D] Consider high-dose nasal steroid if >12 years. **Mometasone** 200mcg *bd* [2A] for 14 days[1]
Nasal decongestants or saline may help some.[2A]

Second line: If systemically very unwell, or more serious signs & symptoms or worsening symptoms on first choice taken for at least 2-3 days:
Co-amoxiclav* 625mg *tds* for 5 days[1A+] *High risk drug for *Clostridium difficile* infection and should be avoided in at-risk patients.
Alternative second choice for penicillin allergy or worsening symptoms on second choice taken for 2 to 3 days: **consult local microbiologist**.

Cautions[3]

Admit to hospital if there is severe systemic infection (sepsis, or if a complication of sinusitis is suspected.[3] Suspect orbital involvement if there is peri-orbital oedema, cellulitis, a displaced globe, double vision, ophthalmoplegia, or reduced visual acuity. Suspect intracranial involvement if there is a severe frontal headache, frontal swelling, symptoms or signs of meningitis, or focal neurological signs.[3]
Consider urgent referral to an Ear, Nose, and Throat (ENT) department if the person is suspected of having a sinonasal tumour (persistent unilateral symptoms, such as bloodstained discharge, nasal obstruction, crusting, non-tender facial pain, facial swelling, or unilateral nasal polyps).[3] Consider routine referral to ENT if the person has frequent recurrent episodes of sinusitis which are troublesome (such as more than three episodes requiring antibiotics in a year). Seek specialist advice if second-line antibiotics have been ineffective.[3] Doxycycline is contra-indicated in children <12 years.[4] (see page 74)

Evidence

S. pneumoniae susceptibility to tetracycline is falling in the UK (88.1% in 2013-14) but *H. influenzae* susceptibility to tetracycline is 98.7% compared with co-amoxiclav at 93%.[5]

References

1. Management of Infection Guidance for Primary Care, PHE.Endorsed by BIA and RCGP, Jan 2017 **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/586766/managing_common_infections.pdf** Accessed July 2017.
2. NICE. Prescribing of antibiotics for self-limiting respiratory tract infections in adults and children in primary care. 2008. (Clinical guideline 69) **https://www.nice.org.uk/guidance/cg69/ifp/chapter/About-this-information** Guidance reviewed February 2014 Accessed February 2017
3. NICE Guideline Sinusitis (acute) : antimicrobial prescribing. Final draft May 2017 **https://www.nice.org.uk/guidance/indevelopment/gid-apg10002/documents**
4. BNF January 2017 Accessed February 2017.
5. British Society for Antimicrobial Chemotherapy Resistance Surveillance Project – susceptibilities 2013-14 **http://www.bsacsurv.org/reports/respiratory** Accessed February 2017.

Ear, Nose and Throat Infections – Oral Candidiasis

When to treat[1]

Oral candidiasis is most commonly caused by Candida albicans, a yeast like fungus which is part of the normal commensal flora of the human gastrointestinal tract. Colonization with Candida is usually asymptomatic however, if mucosal barriers are disrupted or defences lowered, it can cause infections ranging from non-life threatening superficial mucocutaneous disorders to invasive disseminated disease involving multiple organs (the latter mostly in immunocompromised). Comorbidities that increase the risk of candidal infections include diabetes mellitus, severe anaemia, and immunocompromise (chemotherapy, radiotherapy, HIV infection, and AIDS). Other risk factors include poor dental hygiene; local trauma; smoking; the use of broad spectrum antibiotics or prolonged courses of antibiotics, or inhaled or oral corticosteroids; and malnutrition.

When to investigate[1]

If the infection has not completely resolved following first line treatment (below), consideration should be given to treating with oral fluconazole for a further 7 days (referral should be arranged if the infection persists after this); swabbing to identify the causative organism; seeking specialist advice. Referral for biopsy should be considered for people with chronic plaque-like candidiasis which is unresponsive to treatment, as it carries a risk of malignancy.

General Advice[1]

Care should be taken when applying the gel to the mouth of infants and young children due to the risk of choking. Advise on good dental hygiene. If the patient is using an inhaled corticosteroid, advise the following: good inhaler technique; rinsing the mouth with water (or cleaning the teeth) after inhalation, to remove any drug particles; using a spacer device to reduce the impaction of particles in the oral cavity; and stepping down the dose of inhaled corticosteroid when appropriate.

Treatment choices[1,2]

First-line for immunocompetent adult and children older than 2 years of age: **Miconazole** oral gel 2.5mls applied *qds* (hold in mouth after food) for at least 7 days after lesions have healed or symptoms have cleared.[3] Children aged 4-24 months: **Miconazole** oral gel 1.25 mls (1/4 of measuring spoon) applied four times a day after meals. Caution, miconazole oral gel is unlicensed for use in a child aged younger than 4 months, or 5-6 months for an infant born pre-term. If miconazole oral gel is unsuitable or not tolerated, **Nystatin** suspension (unlicensed for use in neonates) 100,000 units (1ml) *qds* usually for 7 days, and continued for 48 hours after lesions have resolved.[3]

Second line if topical treatment is ineffective, infection is extensive or severe, or the person is significantly immunocompromised: for adults and children over 16 years of age, oral **fluconazole** 50mg *od* for 7-14 days (100mg *od*[2] if HIV or immunocompromised). For children younger than 16 years of age, or if fluconazole is contraindicated, specialist advice should be sought.

Cautions[1]

Miconazole can inhibit the metabolism of drugs metabolized by the CYP3A4 and CYP2C9 enzyme systems, resulting in an increase and/or prolongation of their effects, including adverse effects. Miconazole oral gel is contra-indicated with simvastatin, quetiapine, drugs known to prolong the QT interval. Use miconazole oral gel *with caution or preferably avoid* with coumarins (***extra monitoring necessary***), certain calcium channel blockers and phenytoin. For a complete list of possible drug interactions of miconazole oral gel see the ***electronic Medicines Compendium*** (eMC) Seek specialist advice before starting antifungal treatment if the patient is taking ciclosporin or oral tacrolimus, especially if these drugs are being used to suppress tissue rejection following transplantation or if the person is receiving chemotherapy.
Admission to hospital should be arranged if there is widespread infection (such as oesophageal candidiasis characterized by difficulty or pain on swallowing, or retrosternal pain), or the person is systemically unwell.
Oral candidiasis is rare in healthy, immunocompetent adults and older childern;[1] consider undiagnosed risk factors, including HIV.

Evidence[1]

Topical azoles are more effective than topical nystatin.[4]

References

1. Candida - oral - **NICE CKS** revised May 17 (accessed August 2017)
2. **Managing common infections: guidance for primary care - GOV.UK** (accessed August 2017)
3. BNF 72 September 2016
4. Zhang LW, Fu JY, Hua H, Yan ZM. Efficacy and safety of miconazole for oral candidiasis: a systematic review and meta-analysis. Oral Dis. 2016 Apr; 22(3):185-195. Available from: **http://www.ncbi.nlm.nih.gov/pubmed/26456226**

Respiratory Tract
Infections

RTI

Respiratory Tract Infections – Acute Cough, Bronchitis (Patient Information Leaflet available from *TARGET*)

When to treat	Presents as cough with or without sputum, breathlessness, wheeze or general malaise. No chest signs other than wheeze and crackles. Crackles, if present, should clear with coughing[1]; if they persist, review diagnosis. **First line management is self-care and safety-netting.** Antibiotics offer little benefit if the patient has no co-morbidities and may cause side effects[1,2,3,4]. More than 90% of acute bronchitis has no identifiable bacterial cause[5]; **A 7-day delayed antibiotic strategy** may be used where this approach is felt to be safe.[2] Patients should be advised to use the prescription if symptoms not settling or significantly worsening and should seek further medical advice if symptoms worsen significantly despite taking antibiotics. **Consider immediate antibiotics** if >80 yrs of age and one of: hospitalised in past year; taking oral steroids; insulin-dependent diabetic; congestive heart failure; serious neurological disorder/stroke or if or >65 years with two of the above.[1,3] Consider using CRP; No antibiotics if CRP<20mg/L and symptoms for >24hr; delayed antibiotics if 20-100 mg/L; immediate antibiotics if >100mg/L.[1]	
When to investigate	Routine follow-up is unnecessary.[1] Re-examine if symptoms deteriorate.[1]	
Treatment choices	**First-line: Amoxicillin** 500mg *tds* for 5 days[1,3] ***OR*** **Doxycycline** 200mg stat then 100 mg *od* for 5 days total[1,3]	**Second line:** *(if Amoxicillin or Doxycycline unsuitable)* **Clarithromycin** 500mg *bd* for 5 days[2]
General advice	Symptom resolution can take up to 3 weeks[3]; acute cough resolves in 90% of children by 25 days.[6] Advise paracetamol or ibuprofen as required, drink plenty of fluids and stop smoking.[1] Cough medicines are not recommended, though unlikely to do harm. Some may find simple remedies like honey and lemon soothing.[1] Low doses of penicillins are more likely to select out resistance.[3] Do not use quinolones (ciprofloxacin, ofloxacin) first line (poor pneumococcal activity); reserve all quinolones (inc. levofloxacin) for proven resistant organisms.[3]	
Evidence	A Cochrane Review of antibiotics for acute bronchitis reported no difference in designation as "clinically improved" between antibiotic and placebo groups at follow-up (11 trials; 3841 participants). Antibiotics were associated with a half-day shorter mean cough duration.[7] A large European multicentre placebo controlled trial found that amoxicillin did not meaningfully alter important outcomes (symptom severity or duration of more severe symptoms). The development of new or worsening symptoms was significantly different between groups but the NNT was high (30) and was roughly equivalent to the number needed to harm.[8]	
References	1. CKS.NICE.org.uk **http://cks.nice.org.uk/cough** (last revised July 2015; Accessed Nov 2017) 2. **https://cks.nice.org.uk/chest-infections-adult** (last revised Nov 2015; accessed Nov 2017) 3. Management of Infection Guidance for Primary Care, PHE & BIA, 1999, **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/643046/Management_and_treatment_of_common_infections.pdf** Reviewed Sept 2017; accessed November 2017 4. NICE. Prescribing of antibiotics for self-limiting respiratory tract infections in adults and children in primary care. **http://guidance.nice.org.uk/CG69** Published 2008; last checked Feb 2014; accessed November 2017 5. Gonzales R et al; Centers for Disease Control and Prevention. Principles of Appropriate Antibiotic Use for Treatment of Uncomplicated Acute Bronchitis: Background. Ann Intern Med. 2001;134:521-529. 6. Thompson M, Vodicka TA, Blair PS, Buckley DI, Heneghan C, Hay AD; TARGET Programme Team. Duration of symptoms of respiratory tract infections in children: systematic review. BMJ. 2013 Dec 11;347 7. Smith SM, Fahey T, Smucny J, Becker LA. Antibiotics for acute bronchitis. Cochrane Database of Systematic Reviews 2017, Issue 6. Art. No.: CD000245. 8. Little P, Stuart B, Moore M et al. Amoxicillin for acute lower-respiratory-tract infection in primary care when pneumonia is not suspected: a 12-country randomized, placebo-controlled trial. Lancet Infect Dis 2013; 13(2): 123-129.	

Respiratory Tract Infections – Influenza

When to treat	Influenza is characterised by the sudden onset of fever, chills, headache, myalgia and extreme fatigue. In healthy individuals, seasonal influenza is an unpleasant but usually self-limiting disease with recovery in 2-7 days.[1] **Vaccination:** Annual vaccination (ideally between September and early November) is essential for all those at risk:[1,2] **At-risk groups** (not exhaustive; exercise clinical judgement): ≥65 years old or child aged 2-4; chronic heart disease (not uncomplicated hypertension); chronic respiratory, kidney, liver or neurological disease; diabetes; pregnant women (up to 2 weeks post-partum); immunocompromised individuals[1]; those in long-stay residential / nursing homes or other long-stay care facilities; all healthcare and social care staff directly involved in patient care (via occupational health depts.), household contacts of immunocompromised individuals and principal carers of dependent individuals. Morbid obesity (BMI ≥40).[4] **Treatment:** For otherwise healthy adults who do not fall into the specified risk groups (see above), antivirals are not recommended unless the individual is felt to be at serious risk of complications.[4] If flu is circulating in the community and a patient in an at-risk group can start treatment within 48h of onset of flu-like illness (or of close-contact exposure), oseltamivir or zanamivir is recommended.[4] Administration commencing beyond 48 hours is an off-label use.
When to investigate	Routine follow up in otherwise healthy patients is not necessary, but advise the person they should: • Return if no improvement after 1 week or they are deteriorating; • Seek urgent medical attention if they develop shortness of breath, pleuritic chest pain or haemoptysis; • Return if they have a low threshold for seeking help if they are caring for a young child or baby with influenza, as children cannot accurately communicate their symptoms.[3] In at-risk groups, consider follow up (particularly in frail people) after 1 week to confirm improvement and to exclude complications.[3]
Treatment choices[1]	**First line:** (after CAS-alert 'go-ahead' from CMO):[4] **Oseltamivir** 75 mg *bd* for 5 days. **Severely immunocompromised patients ≥ 5yr or where oseltamivir resistance suspected:**[4] **Zanamivir** 10 mg (2 inhalations by diskhaler) *bd* for 5 days. (**Post-exposure prophylactic regimens:** The above agents are given ONCE daily for 10 days). For detailed advice on paediatric dosing, consult product literature or latest PHE guidance.[4]
Evidence	After immunisation, antibody levels may take up to 10 to 14 days to reach protective levels.[1]
References	1. Department of Health Green Book Immunisation against infectious disease. Influenza. (Updated Oct 2017; Accessed Nov 2017). **https://www.gov.uk/government/publications/influenza-the-green-book-chapter-19** 2. Management of Infection Guidance for Primary Care, PHE & BIA Reviewed Sept 2017; accessed Nov 2017 **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/643046/Management_and_treatment_of_common_infections.pdf** 3. NICE CKS Influenza-Seasonal **https://cks.nice.org.uk/influenza-seasonal** (Updated Nov 2015; Accessed Nov 2017) 4. PHE guidance on antiviral agents for the treatment and prophylaxis of influenza. Updated Aug 2017;Accessed Nov 2017) **https://www.gov.uk/government/collections/seasonal-influenza-guidance-data-and-analysis**

Respiratory Tract Infections – COPD Acute Exacerbation

When to treat

Antibiotics should be used to treat exacerbations of COPD associated with a history of more purulent sputum.[1A,2] Patients with exacerbations without more purulent sputum do not need antibiotic therapy unless there is consolidation on a chest radiograph or clinical signs of pneumonia.[1B] Alternative treatments include bronchodilators and oral steroids (see CKS2).

When to investigate

Sending sputum samples for culture is not recommended in routine practice.[1] Pulse oximetry is of value if there are clinical features of a severe exacerbation.[1]

Treatment choices[1,2,3]

Amoxicillin 500mg *tds* for 5 days
OR if allergic to penicillin:
Doxycycline 200mg stat then 100-200mg *od* for 5 days[C]
Some hospital specialists may prescribe high-dose doxycycline 200mg *bd* for 2 days then 200mg *od* for 4 days (16 capsules).[D]
***OR* Clarithromycin** 500mg *bd* for 5 days[A]

If the person has an increased risk of antibiotic resistance risk or known previous resistance, (comorbid disease, severe COPD, frequent exacerbations, or antibiotic use in the past 3 months), prescribe **co-amoxiclav*** 500/125 mg three times daily for 5 days
*High risk drug for *Clostridium difficile* infection and should be avoided in at-risk patients.

Cautions

Consider hospital admission if the person has any of the following[2]:

- severe breathlessness,
- rapid onset of symptoms,
- acute confusion,
- cyanosis,
- worsening peripheral oedema, impaired consciousness
- the person is unable to cope or lives alone.
- a reduction in activities of daily living, is confined to bed, or is on long-term oxygen therapy (LTOT).
- significant comorbidity
- low oxygen saturation (less than 90%) on pulse oximetry

Evidence

A Cochrane review supports antibiotics for patients with COPD exacerbations with increased cough and sputum purulence who are moderately or severely ill.[4] However, the authors reported that the analysis restricted to community-based studies (2 studies) did not find differences between antibiotic and placebo.
A meta-analysis of 21 double-blind RCTs involving 10,698 patients, concluded that clinical cure at early follow-up was the same following a short course of antibiotic treatment (≤5 days; 77.2% cure) compared to longer treatment (>5 days; 77.4% cure) in patients with mild to moderate exacerbations of chronic bronchitis and COPD (OR 0.99; 0.90-1.08).[5]
Resistance data from **www.bsacsurv.org** for UK respiratory specimens in 2015-16 indicate resistance to amoxicillin in *S. pneumoniae* isolates (n=262) was 0%; *H. influenzae* (n=277) resistance to amoxicillin was 25% and to co-amoxiclav was 5%.
Respiratory quinolones such as levofloxacin and moxifloxacin are not more effective than macrolides.[6]

References

1. NICE 2010. CG101: Chronic obstructive pulmonary disease in over 16s: diagnosis and management. **https://www.nice.org.uk/guidance/cg101** [Accessed 01 December 2017]
2. Clinical Knowledge Summaries. Chronic Obstructive Pulmonary Disease: Acute exacerbation. **https://cks.nice.org.uk/** [Accessed 01Dec17].
3. PHE Managing Common Infections, September 2017. **https://www.gov.uk/government/publications/managing-common-infections-guidance-for-primary-care**
4. Ram FS et al, 2006. Antibiotics for exacerbations of chronic obstructive pulmonary disease. Cochrane Database Syst Rev. **https://www.ncbi.nlm.nih.gov/pubmed/16625602**
5. El Moussaoui R et al, 2008. Short-course antibiotic treatment in acute exacerbations of chronic bronchitis and COPD: a meta-analysis of double-blind studies. Thorax. 2008 May. **https://www.ncbi.nlm.nih.gov/pubmed/18234905**
6. Siempos II et al, 2007. Macrolides, quinolones and amoxicillin/clavulanate for chronic bronchitis: a meta-analysis. Eur Respir J. 2007 Jun. **https://www.ncbi.nlm.nih.gov/pubmed/17301097**

Respiratory Tract Infections – Community-Acquired Pneumonia (CAP)
FOR PAEDIATRIC GUIDELINES see page 88

When to treat

The diagnosis of pneumonia is based on assessment of symptoms and clinical signs, which usually include cough, fever and difficulty breathing. However these features may be absent (for example in the elderly).[1] When a clinical diagnosis of community-acquired pneumonia is made in primary care, determine whether patients are at low, intermediate or high risk of death using the CRB65 score.[1,2,3]

CRB65 score is calculated by giving 1 point for each of the following prognostic features[1]:

- confusion (abbreviated Mental Test score 8 or less, or new disorientation in person, place or time)
- respiratory rate ≥30 breaths/minute
- BP systolic <90mmHg or diastolic ≤60 mmHg
- age ≥65 years.

Interpretation of CRB65 score:

- CRB65 score 0 = low severity (risk of death <1%); patients do not normally require hospitalisation for clinical reasons
- CRB65 score 1-2 = moderate severity (risk of death 1-10%); consider hospital referral (particularly if score 2)
- CRB65 score ≥3 or more = high severity (risk of death >10%); urgent hospital admission.*

When to investigate

Low-severity CAP: do not routinely offer microbiological tests. Moderate-severity CAP: take blood and sputum for culture.[1]
General practitioners should consider use of pulse oximeters allow for simple assessment of oxygenation.[3]
Consider a point of care C-reactive protein test if after clinical assessment a diagnosis of pneumonia has not been made and it is not clear whether antibiotics should be prescribed.[1,5] If CRP<20mg/L do not routinely offer antibiotic therapy. Patients must have had symptoms for at least 24-36hours.

Treatment choices[1,2]

If CRB-65 score is 0 (low severity), prescribe monotherapy[1]:

- **Amoxicillin** (first-line, if no penicillin allergy) 500 mg three times daily for 5 days,
- or **doxycycline** 200mg on the first day then 100mg once daily, for a total of 5 days,
- or **clarithromycin** 500mg twice daily for 5 days

Consider longer course if not improving as expected after 3 days.[1]

If the CRB-65 score is 1 or 2 (moderate severity):

- **amoxicillin** 500mg three times daily **AND clarithromycin** 500mg twice daily for 7 days,
- or **doxycycline** monotherapy[2,3] 200 mg on the first day then 100mg once daily, for 7 days; some hospital specialists may prescribe high-dose doxycycline 200mg *bd* for 2 days then 200mg od for 4 days (16 capsules).[D]

Do not routinely offer patients with low-severity CAP a fluoroquinolone or dual antibiotic therapy.[1]

Cautions

*Give immediate IM Benzylpenicillin 1.2g or Amoxicillin 1g po (IM Cefotaxime in non-severe penicillin allergy) if delayed admission/life threatening.[3]
Advise the person to seek medical advice within 3 days if symptoms do not begin to improve, or earlier if symptoms worsen as hospital admission may be needed.[2]
Most people can expect that by 1 week, fever should have resolved, and by 4 weeks, chest pain and sputum production should have substantially reduced.[1]
Doxycycline is contra-indicated in children <12 yrs (see page 79).

Evidence

Approximately 7% of patients presenting with acute cough to primary care in England have radiographic CAP.5 In a US emergency department setting, the presence of at least one respiratory complaint (cough, chest pain, SOB) AND at least one vital sign abnormality (temp >38°C; HR >100; RR>20; Sats on air <95%) had a 90% sensitivity for radiographic CAP (PPV 30%, NPV 98.6%; CAP prevalence 10%).[6]

References

1. NICE 2014. CG191: Pneumonia in adults: diagnosis and management. **https://www.nice.org.uk/guidance/cg191** [Accessed 01 December 2017]
2. Clinical Knowledge Summaries. Chronic Obstructive Pulmonary Disease: Acute exacerbation. **https://cks.nice.org.uk/** [Accessed 01Dec17].
3. BTS 2015. Annotated BTS Guideline for the management of CAP in adults 2015. **www.brit-thoracic.org.uk** [Accessed 01Dec17]
4. PHE Managing Common Infections, September 2017. **https://www.gov.uk/government/publications/managing-common-infections-guidance-for-primary-care**
5. van Vugt SF & GRACE consortium, 2013. Use of serum C-reactive protein and procalcitonin concentrations in addition to symptoms and signs to predict pneumonia in patients presenting to primary care with acute cough: diagnostic study. BMJ. 2013 Apr. **https://www.ncbi.nlm.nih.gov/pubmed/23633005**
6. Khalil A, Kelen G, Rothman RE. A simple screening tool for identification of community-acquired pneumonia in an inner city emergency department. Emerg Med J. 2007 May. **https://www.ncbi.nlm.nih.gov/pubmed/17452700**

Central Nervous System

Infections

Central Nervous System Infections – Meningitis or Suspected Meningococcal Disease

When to treat	Transfer all patients to hospital immediately.[1] IF time before admission, and non-blanching rash, give IV cefotaxime or benzylpenicillin [3B+], unless allergic, i.e. history of difficulty breathing, collapse, loss of consciousness, or rash.[1B-] If a patient with suspected bacterial meningitis without non-blanching rash cannot be transferred to hospital urgently, cefotaxime or benzylpenicillin or should be given before the transfer.[1B-]		
Treatment choices	**IV or IM Cefotaxime**[4] one dose Child: 1 month - 11yrs: 50mg/kg (max 1g) Child: 12-18yrs: 1g Adult: 1g	***OR* IV or IM Benzylpenicillin:**[4] Neonate 50mg/kg Child: 1 month - 1yr: 300mg Child: 1yr - 9yrs: 600mg Child: 10-18yrs: 1.2g Adult: 1.2g Give IM if vein cannot be found.[1]	If history of immediate allergic reactions to penicillin or cephalosporins[4], IV **Chloramphenicol** Child: 1 month - 18 yrs: 25mg/kg IV Adult: 25mg/kg IV
	Prevention of secondary case of meningitis.[5] Only prescribe following advice from Public Health Doctor: 9am - 5pm **0344 225 3861** (PHE South-east). Out-of-hours contact: **0844 967 0082**.		
Cautions	For suspected meningococcal disease (meningitis with non-blanching rash or meningococcal septicaemia), give parenteral antibiotics (intramuscular or intravenous benzylpenicillin or Cefotaxime) at the earliest opportunity in primary care, but do not delay urgent transfer to hospital to give the parenteral antibiotics.[2] Only withhold benzylpenicillin in children and young people who have a clear history of anaphylaxis after a previous dose; a history of a rash following penicillin is not a contraindication.[2]		
Evidence	The NICE guideline development group recommended benzylpenicillin because it is the most frequently used antibiotic in primary care and they found no evidence to recommend an alternative antibiotic.[2] Cefotaxime should be the first line antibiotic in meningococcal sepsis.[3]		
References	1. Management of Infection Guidance for Primary Care, PHE & BIA, Accessed June 2017. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** 2. NICE. Bacterial meningitis and meningococcal septicaemia. National Collaborating Centre for Women's and Children's health 2010. Updated Feb 2015 (Clinical Guideline 102) **http://guidance.nice.org.uk/CG102/Guidance** 3. SIGN 2008. Management of invasive meningococcal disease in children and young people. Scottish Intercollegiate Guidelines Network. 2008 **http://www.sign.ac.uk/assets/sign102.pdf** 4. BNF for Children April 2017 Accessed June 2017 5. Public Health England 2014 Preventing secondary cases of invasive meningococcal capsular group B (MenB) disease: benefits of offering vaccination in addition to antibiotic chemoprophylaxis to close contacts of cases in the household, educational setting, clusters and the wider community. **https://www.gov.uk/government/publications/invasive-meningococcus-capsular-group-b-menb-preventing-secondary-cases** Accessed June 2017.		

Urinary Tract
Infections

Urinary Tract Infections – Uncomplicated UTI in Women (Patient Information Leaflet available from *TARGET UTI*)

When to treat

Women 18-65y: offer empirical antibiotics to those with severe symptoms or ≥ 2 of burning dysuria, urine cloudiness or night frequency; 74% will be culture-positive.[1]

- Women 18-65y with only one of the three symptoms/signs: perform dipstick test (see below) to guide treatment decision (morning specimen most reliable).[1]
- Women 18-65y with none of the three symptoms/signs: consider dipstick test; 67% will be culture-negative.[1]
- Women >65y: asymptomatic bacteriuria is common in older patients (32% in nursing home residents).[2] Treating does not reduce mortality or prevent symptomatic episodes, but does increase side-effects and antibiotic resistance.[4] Consider dipstick test to exclude UTI in symptomatic patients only.

Dipstick testing

- Women 18-65y: If all three variables (nitrites, leucocytes, blood) are negative, UTI is unlikely (76% will be culture-negative); offer symptomatic advice and consider delayed prescribing.[1] Positive nitrite OR both positive leucocytes + positive blood, indicates probable UTI (81% will be culture-positive).[1]
- Women >65y[2]: Dipstick for symptomatic patients only. If both nitrites negative and leucocytes negative, UTI is unlikely (78% culture-negative). If both nitrites positive and leucocytes positive a positive culture is likely (78% culture-positive). If only one of nitrites or leucocytes positive, 50% will be culture-negative.[2]

Non-pregnant women with asymptomatic bacteriuria should not receive antibiotic treatment.[3]
In women with symptoms of vaginal itch or discharge, explore alternative diagnoses and consider pelvic examination.[3]

When to investigate

Do not culture routinely for urinary symptoms in adult women <65 years.[2] In sexually active young women, consider Chlamydia trachomatis.[2C]
Do not send urine for culture in asymptomatic elderly with positive dipsticks; only send urine for culture if two or more signs of infection, especially dysuria, fever > 38°C or new incontinence.[2]
Perform culture (mid-stream) if failed antibiotic treatment[2], persistent symptoms[2] or patient is immunosuppressed.[4]

How to respond to a positive lab report[4]

Single organism ≥ 10^4 colony forming units (CFU)/mL **OR** ≥ 10^5 mixed growth with one predominant organism **OR** *E. coli* or *Staphylococcus saprophyticus* ≥ 10^3 CFU/mL usually indicates UTI in patient with urinary symptoms. Single *E Coli* may be as low as 10^2 CFU/ml and be positive.[9]
White cells ≥10^4/mL are considered to represent inflammation. In adults 'no white cells present' indicates no inflammation and reduces culture significance. Epithelial cells/mixed growth indicates perineal contamination, reducing significance of culture.

Treatment choices

First line: Nitrofurantoin[B+] 100mg m/r *bd* or 50mg i/r *qds* for 3 days[6] if GFR>45mL/min*
OR if low risk of resistance:**
Trimethoprim[B+] 200mg *bd* for 3 days [6A+]

If first line unsuitable or GFR<45ml/min:[6A+] **Pivmecillinam** 400mg stat **THEN** 200mg *tds* for 3 days (400mg *tds* for 3 days if high resistance risk or known previous resistance)
If organism susceptible: Amoxicillin[6A+] 500mg *tds* for 3 days
If high resistance risk: Fosfomycin** 3g single dose[6B]

Note: As antimicrobial resistance and *Escherichia coli* bacteraemia is increasing, use nitrofurantoin first line,[B-] always give safety net and self-care advice, and consider risks for resistance.[1D]

Cautions

The activity of nitrofurantoin is reduced with increasing pH; avoid alkalinising agents e.g. potassium citrate.[6]
*Avoid nitrofurantoin if eGFR<45ml/min, (risk of peripheral neuropathy; ineffective due to inadequate urine concentrations[8]), although may be suitable in some patients with a eGFR of 30-44ml/min if a short course (3-7 days) is prescribed. Prescribe for lower UTI where the benefits outweigh the risk of side effects.[8]
****Risk factors** for increased antibiotic resistance include: care-home resident; recurrent UTI; hospitalisation for >7 days in the last 6 months; unresolving urinary symptoms; recent travel to a country with increased resistance; previous UTI resistant to trimethoprim, cephalosporins, or quinolones.[6]

Evidence

Three days of treatment with nitrofurantoin has been shown to be effective in non-pregnant adult women with uncomplicated UTI.[6]

References

1. Little P et al. Health Technol Assess. 2009 Mar;13(19):iii-iv, ix-xi, 1-73.
2. Sundvall PD, Gunnarsson RK. BMC Geriatr. 2009 Jul 27;9:32. **https://www.ncbi.nlm.nih.gov/pubmed/19364448**
3. SIGN 88 UTI 2012 **http://www.sign.ac.uk/assets/sign88.pdf** (Accessed June 2017)
4. PHE. Diagnosis of UTI – Quick Reference Guide for primary care. Sept 2014. **https://www.gov.uk/government/publications/urinary-tract-infection-diagnosis**
5. Clinical knowledge Summaries Urinary Tract Infection – Lower, Women. **https://cks.nice.org.uk/urinary-tract-infection-lower-women**
6. PHE Managing Common Infections, September 2017. **https://www.gov.uk/government/publications/managing-common-infections-guidance-for-primary-care**
7. Ben-Ami R et al, Clin Infect Dis. 2009 Sep 1;49(5):682-90. **https://www.ncbi.nlm.nih.gov/pubmed/19622043**
8. MHRA 2014. **https://www.gov.uk/drug-safety-update/nitrofurantoin-now-contraindicated-in-most-patients-with-an-estimated-glomerular-filtration-rate-egfr-of-less-than-45-ml-min-1-73m2**
9. **http://www.nejm.org/doi/full/10.1056/NEJMoa1302186#t=article**

Urinary Tract Infections – Lower UTI in Pregnancy (Patient Information Leaflet available from *TARGET UTI*)

When to treat	Send MSU for culture; start antibiotics in all with significant bacteriuria, even if asymptomatic [NICE CG62].[1,2A] systematic review concluded that antibiotic treatment of asymptomatic bacteriuria in pregnancy reduces the risk of upper urinary tract infection, pre-term delivery and low birth weight babies.[7]
When to investigate	MSU should be performed routinely at the first antenatal visit.[1,2] If bacteriuria is reported, it should be confirmed with a second MSU.[1,2] Dipstick testing is not sufficiently sensitive to be used for screening for bacteriuria in pregnant women (too many false negatives).[1,2] Given the risks of symptomatic bacteriuria in pregnancy, a urine culture should be performed seven days after completion of antibiotic treatment as a test of cure.[1]
How to respond to a positive lab report[2]	Single organism ≥ 10^4 colony forming units (CFU)/mL or ≥ 10^5 mixed growth with one predominant organism or E. coli or Staphylococcus saprophyticus ≥ 10^3 CFU/mL usually indicates UTI in patient with urinary symptoms. In adults 'no white cells present' indicates no inflammation & reduces culture significance. Epithelial cells/mixed growth indicates perineal contamination, reducing significance of culture.[3] Women with bacteriuria confirmed by a second urine culture should be treated and have repeat urine culture at each antenatal visit until delivery.[1]
Treatment choices	**First line:**[2,3] Treat for 7 days[C] **Nitrofurantoin (unless at term)** 100mg m/r *bd* ***OR*** 50mg i/r QDS if GFR >45ml/min **Second line:**[3] Treat for 7 days **Trimethoprim** 200mg *bd* (off-label). Give folic acid (5mg daily) if first trimester.[3] Avoid trimethoprim if low folate status or on folate antagonist[2] **Third line:** **Cefalexin*** 500mg *bd* for 7 days[B-] **Note: As antimicrobial resistance and *Escherichia coli* bacteraemia is increasing, use nitrofurantoin first line,[B-] always give safety net and self-care advice, and consider risks for resistance.[1D]**
Cautions	The activity of nitrofurantoin is reduced with increasing pH; avoid alkalinising agents e.g. potassium citrate (available OTC).[2] Trimethoprim is a folate antagonist. Folate supplementation during the first trimester reduces the risk of neural tube defects in offspring of pregnant women treated with trimethoprim.[2] In women with normal folate status, who are well nourished, trimethoprim is unlikely to cause folate deficiency.[4] However, it should not be used by women with established folate deficiency or low dietary folate intake, or by women taking other folate antagonists (e.g. antiepileptic drugs or proguanil).[2,3,4] Avoid nitrofurantoin if eGFR<45ml/min, (risk of peripheral neuropathy; ineffective due to inadequate urine concentrations[5]), although may be suitable in some patients with a eGFR of between 30-44ml/min if a short course (3-7 days) is prescribed. Prescribe for lower UTI where the benefits outweigh the risk of side effects.[6] *High-risk drug for *Clostridium difficile* infection and should be avoided in at-risk patients, however risk in pregnancy is generally low.[9]
Evidence	Nitrofurantoin has been associated with haemolysis in people with G6PD deficiency. However, the risk seems very small because placental transfer is so low.[2] There is only one reported case of haemolytic anaemia in a newborn whose mother was treated at term with nitrofurantoin.[2] The efficacy and safety profiles of nitrofurantoin are supported in a recent large multicentre study undertaken by the World Health Organization in which 778 pregnant women with asymptomatic bacteriuria were treated with nitrofurantoin [Lumbiganon et al, 2009]. A cure rate of 86% was achieved with a 7-day course.[3]
References	1. SIGN 88 UTI 2012 **http://www.sign.ac.uk/assets/sign88.pdf** (AccessedAug 2017) 2. PHE Managing Common Infections, September 2017. **https://www.gov.uk/government/publications/managing-common-infections-guidance-for-primary-care** 3. Clinical Knowledge Summaries Urinary Tract Infection – Lower, Women. **http://cks.nice.org.uk/urinary-tract-infection-lower-women** (Accessed Aug 2017) 4. UK Teratology Information Service. Antibiotic Use in pregnancy Feb 2013, Use of Nitrofurantoin in Pregnancy Nov 2015, Use of trimethoprim in pregnancy Dec 2013 (Tel: 0344 892 0909) **www.toxbase.org** (Accessed June 2017) 5. BNF 73 April 2017 (Accessed June 2017) 6. MHRA 2014. **https://www.gov.uk/drug-safety-update/nitrofurantoin-now-contraindicated-in-most-patients-with-an-estimated-glomerular-filtration-rate-egfr-of-less-than-45-ml-min-1-73m2** 7. Smaill FM, Vazquez JC. Antibiotics for asymptomatic bacteriuria in pregnancy. Cochrane Database Syst Rev. 2015 Aug 7;(8):CD000490. 8. Widmer M, Lopez I, Gülmezoglu AM, Mignini L, Roganti A. Duration of treatment for asymptomatic bacteriuria during pregnancy. Cochrane Database Syst Rev. 2015 Nov 11;(11):CD000491 9. NHS Choices 04 Dec 2017 **http://www.nhs.uk/chq/Pages/2583.aspx?CategoryID=54&**

Urinary Tract Infections – Lower UTI in Men

When to treat	Men <65 years: consider prostatitis and send MSU, or if symptoms mild or non-specific, use negative dipstick to exclude UTI. Conditions like prostatitis, chlamydial infection and epididymitis should be considered in the differential diagnosis of men with acute dysuria or frequency and appropriate diagnostic tests should be considered.[1] In elderly men (over 65 years of age), treatment of asymptomatic bacteriuria does not reduce mortality or significantly reduce symptomatic episodes.[1] Antibiotic treatment significantly increases the risk of adverse events, such as rashes and gastrointestinal symptoms (NNTH 3).[1] If treatment failure: always perform culture.	
When to investigate	A urine sample is recommended because UTI in men is generally regarded as complicated (it results from an anatomic or functional abnormality).[1,2] Send pre-treatment MSU[3C] OR if symptoms mild/non-specific, use negative dipstick (both nitrite & leucocytes) to exclude UTI.[3,4 C]	
How to respond to a positive lab report[2]	Follow up after 48 hours (or according to the clinical situation) to check response to treatment and the urine culture results.[4] Obtaining a clean-catch sample of urine in men is easier than in women and a colony count of ≥10^3 cfu/ml may be sufficient to diagnose UTI in a man with signs and symptoms as long as 80% of the growth is of one organism.[1]	
Treatment choices	**First line** (if afebrile):[3,4] Treat for 7 days[3,4 C] **Trimethoprim** 200mg bd (if low risk of resistance**) ***OR*** (if high risk of resistance, or known previous resistance): **Nitrofurantoin**[B+] 100mg m/r bd or 50mg i/r qds* **First line** (fever >38.2°C or recurrent UTI): Treat for 14 days[8] **Ciprofloxacin** 500mg *bd*	**If first line unsuitable or GFR<45ml/min:**[2A+] + **Pivmecillinam** 400mg stat then 200mg *tds* for 7 days (400mg *tds* for 7 days if high resistance risk, or known previous resistance) **If organism susceptible: Amoxicillin**[2A+] 500mg *tds* for 7 days **If high resistance risk**: Fosfomycin** 3g stat then repeat on day 3 (unlicensed)[2B]
	Note: As antimicrobial resistance and *Escherichia coli* bacteraemia is increasing, always give safety net and self-care advice, and consider risks for resistance.[1D]	
Cautions	*Avoid nitrofurantoin if eGFR<45ml/min, (risk of peripheral neuropathy; ineffective due to inadequate urine concentrations.[5,6]), although may be suitable in some patients with a eGFR of 30-44ml/min if a short course (max7 days) is prescribed. Prescribe for lower UTI where the benefits outweigh the risk of side effects.[7] **Risk factors for increased resistance include: care-home resident; recurrent UTI; hospitalisation for >7 days in the last 6 months; unresolving urinary symptoms; recent travel to a country with increased resistance; previous UTI resistant to trimethoprim, cephalosporins, or quinolones.	
Evidence	No high quality evidence for the treatment of bacterial UTI in men was identified.[1]	
References	1. **http://www.sign.ac.uk/sign-88-management-of-suspected-bacterial-urinary-tract-infection-in-adults.html** (Accessed July 2017) 2. PHE Managing Common Infections, September 2017. **https://www.gov.uk/government/publications/managing-common-infections-guidance-for-primary-care** 3. Management of Infection Guidance for Primary Care, PHE & BIA, Jan 2017. Managing common infections: guidance for primary care - GOV.UK 4. Clinical Knowledge Summaries Urinary Tract Infection (lower) – Men. **https://cks.nice.org.uk/urinary-tract-infection-lower-men#!topicsummary** (Accessed July 2017) 5. BNF 73, April 2017 (Accessed June 2017) 6. Sachs J et al. Effect of renal function on urinary recovery of orally administered nitrofurantoin. NEJM 1968; 278(19): 1032-1035 7. MHRA 2014. **https://www.gov.uk/drug-safety-update/nitrofurantoin-now-contraindicated-in-most-patients-with-an-estimated-glomerular-filtration-rate-egfr-of-less-than-45-ml-min-1-73m2** 8. van Nieuwkoop C et al, BMC Med. 2017 Apr 3;15(1):70. **https://www.ncbi.nlm.nih.gov/pubmed/28366170**	

Urinary Tract Infections – Catheter-associated UTI

When to treat

Between 2% and 7% of patients with indwelling urethral catheters acquire bacteriuria each day, even with the application of best practice for insertion and care of the catheter.[1] All patients with a long-term indwelling catheter are bacteriuric, often with two or more organisms.[1] Treatment of asymptomatic bacteriuria does not reduce mortality or prevent symptomatic episodes and causes harm: increased short-term frequency of symptomatic infection and re-infection with antimicrobial-resistant organisms.[2B+,3]

Catheter in situ: antibiotics will not eradicate asymptomatic bacteriuria; only treat if systemically unwell or pyelonephritis likely.[4B+] Treat after urine sent for culture if new onset of delirium and 2/more symptoms (including new onset or worsening of fever, rigors, altered mental status, malaise, or lethargy with no other identified cause; flank pain; costo-vertebral angle tenderness; acute haematuria; pelvic discomfort; and in those whose catheters have been removed, dysuria, urgent or frequent urination, or supra-pubic pain or tenderness.[1] In patients with spinal cord injury, increased spasticity, autonomic dysreflexia, or sense of unease are also compatible with catheter-associated UTI.[1]

Consider changing the catheter to manage the UTI[1] If an indwelling catheter has been in place for >2 weeks at the onset of UTI, and if the catheter is still indicated, replace the catheter to hasten resolution of symptoms and reduce the risk of subsequent UTI.[10] Obtain urine specimen for culture from the freshly-placed catheter before initiating antibiotic therapy.[5]

When to investigate

Symptomatic catheter-associated UTI (CA-UTI) cannot be differentiated from UTI asymptomatic bacteriuria on the basis of urine analysis with dipstick tests.[1] **Dipstick testing should not be used to diagnose UTI in catheterised patients.**[1] A urine specimen for culture should be obtained prior to initiating antimicrobial therapy for presumed CA-UTI because of the wide spectrum of potential infecting organisms and the increased likelihood of antimicrobial resistance.[5]

In patients with short-term catheterisation, it is recommended that specimens be obtained by sampling through the catheter port using aseptic technique or, if a port is not present, puncturing the catheter tubing with a needle and syringe.[5] Culture specimens should not be obtained from the drainage bag.

How to respond to a positive lab report

If urine culture shows that the organism is resistant to the current antibiotic, and:

- If symptoms have not resolved, change to an antibiotic that the organism is sensitive to.
- If symptoms recur, start treat with an antibiotic shown in the culture to cover the infecting organism.

Treatment choices

Lower UTI:[6] **Nitrofurantoin** 100mg m/r *bd* ***OR*** 50mg I/R *qds* for for 7 days
OR **Trimethoprim** 200mg *bd* for 7 days if culture sensitive
ONLY TREAT IF SYMPTOMATIC

Upper UTI (fever or loin pain):[6]
See Pyelonephritis

Cautions

Nitrofurantoin is now contraindicated in patients with an estimated glomerular filtration rate (eGFR) of less than 45 ml/min. However, a short course (3 to 7 days) may be used with caution in certain patients with an eGFR of 30 to 44 ml/min. [9]
Treatment may need to be extended to 10-14days in patients with a delayed response[1, 5B+]

Evidence

When changing catheters in patients with a long-term indwelling urinary catheter: do not offer antibiotic prophylaxis routinely.[1] Consider antibiotic prophylaxis for patients with a history of symptomatic UTI after catheter change or who experience trauma during catheterisation.[4B]

References

1. **http://www.sign.ac.uk/sign-88-management-of-suspected-bacterial-urinary-tract-infection-in-adults.html** (Accessed Aug 2017)
2. PHE. Diagnosis of UTI – Quick Reference Guide for primary care. Sept 2014 **Urinary tract infection: diagnosis guide for primary care - GOV.UK**
3. European Association of Urology. Guidelines on Urological Infections 2015. **http://uroweb.org/wp-content/uploads/19-Urological-infections_LR2.pdf**
4. PHE Managing Common Infections, September 2017. **https://www.gov.uk/government/publications/managing-common-infections-guidance-for-primary-care**
5. Infectious Diseases Society of America. Diagnosis, Prevention, and Treatment of Catheter-Associated Urinary Tract Infection in Adults: 2009 International Clinical Practice Guideline **https://academic.oup.com/cid/article/50/5/625/324341/Diagnosis-Prevention-and-Treatment-of-Catheter** (Accessed Aug 2017).
6. Clinical Knowledge Summaries Urinary Tract Infection – Lower, Women. **Urinary tract infection (lower) - women - NICE CKS** (Accessed Feb 2017)
7. BNF 73, April 2017 (Accessed June 2017)
8. Clinical Knowledge Summaries Urinary Tract Infection (lower) – Men. **Urinary tract infection (lower) - men - NICE CKS** (Accessed Feb 2017)
9. MHRA 2014. **https://www.gov.uk/drug-safety-update/nitrofurantoin-now-contraindicated-in-most-patients-with-an-estimated-glomerular-filtration-rate-egfr-of-less-than-45-ml-min-1-73m2**
10. Raz R, Schiller D, Nicolle LE. Chronic indwelling catheter replacement before antimicrobial therapy for symptomatic urinary tract infection. J Urol. 2000 Oct;164(4):1254-8.

Urinary Tract Infections – Recurrent UTI in Non-Pregnant Women – Prophylaxis (Patient Information Leaflet available from *TARGET UTI*)

When to treat

Recurrent UTI is defined as 2 in 6 months or ≥ 3 UTIs per year.[1]
If cystitis is related to sexual intercourse, advise: Using a different contraceptive method if a diaphragm is being used; using a lubricant if symptoms could be due to mild trauma rather than infection.[2] Encourage post-coital voiding.[6D]

- Continuous or postcoital antimicrobial prophylaxis should be considered only after counselling and behavioural modification has been attempted, and when non-antimicrobial measures have been unsuccessful.[3]
- In appropriate women with recurrent uncomplicated cystitis, self-diagnosis and self-treatment with a short course 'stand-by' regimen of an antimicrobial agent should be considered.[1,2,3B+]

When to investigate

Seeking specialist advice before starting continuous antibiotic prophylaxis is recommended pragmatically to decide whether the woman needs investigation to exclude an underlying cause.[2]

How to respond to a positive lab report

Before any prophylaxis regimen is initiated, eradication of a previous UTI should be confirmed by a negative urine culture 1-2 weeks after treatment.[3] The choice of antibiotics should be based upon the identification and susceptibility pattern of the organism that causes the UTI and the patient's history of drug allergies.[3]

Treatment choices

Non-antibiotic treatment:[2]

- Hydration(1.6L/day) and ibuprofen for symptom relief
- Cranberry products may reduce the recurrence rate of cystitis, and are available from shops. These products work for some women[D]
- Cranberry products should not be taken if warfarin is being used.
- High strength capsules (containing at least 200mg of cranberry extract) are recommended because they may be more effective than cranberry juice.[D]
- Probiotics containing lactobacilli[8B] (oral or vaginal)

Second Line:
STAND-BY[6] ***OR***
For women in whom episodes of infection are associated with sexual intercourse:[1B+]
post-coital dose[1,3] to be taken within 2 hours of intercourse[2] (off-label use)
First line: Nitrofurantoin 100mg m/r caps stat
Second line: Ciprofloxacin 500mg stat
If recent culture sensitive: **Trimethoprim** 100mg stat

Long-term low dose prophylaxis for 3-6 months then review recurrence rate and need:
Methenamine hippurate[7A+] 1G *bd* for 6 months (consider adding in Ascorbic Acid to possibly enhance acidity of urine)[D]
OR

- **Nitrofurantoin** 100mg m/r at night[1,3]
- *If recent culture sensitive:* **Trimethoprim**[1,3] 100mg at night
- **Ciprofloxacin** 500mg at night[1,3] – check with micro

Cautions

Monitor patients on long term nitrofurantoin for signs of pulmonary fibrosis.[4] Avoid nitrofurantoin if eGFR<45ml/min,(risk of peripheral neuropathy; ineffective due to inadequate urine concentrations.[4]), although may be suitable in some patients with a eGFR of between 30-44ml/min if a short course (3-7 days) is prescribed. Prescribe for lower UTI where the benefits outweigh the risk of side effects.[5]
Long term prophylaxis: A 3 to 6-month trial is recommended, as this reflects the duration of most trials of prophylactic antibiotics.[2] Information on long- term follow up is lacking therefore benefits beyond 6-12 months are unknown. Review at 3- 6 months[1] and consider stopping.

Evidence

Nightly prophylaxis: pooled data from 10 RCTs of poor methodological quality calculated a Relative Risk of having one microbiological recurrence was 0.21 (95% CI 0.13 to 0.34), favouring antibiotic and the NNT was 1.85 over 6-12 months. But adverse effects do occur and 30% of women did not adhere to treatment.[1]

References

1. PHE Managing Common Infections, September 2017. **https://www.gov.uk/government/publications/managing-common-infections-guidance-for-primary-care**
2. CKS Urinary Tract Infection (lower) – Women – Recurrent cystitis **https://cks.nice.org.uk/urinary-tract-infection-lower-women#!scenario:2** (accessed Aug 2017)
3. European Association of Urology. Guidelines on Urological Infections 2015. **http://uroweb.org/wp-content/uploads/19-Urological-infections_LR2.pdf** (Accessed Aug 2017)
4. BNF 73, Apr 2017 (Accessed June 2017)
5. MHRA 2014. **https://www.gov.uk/drug-safety-update/nitrofurantoin-now-contraindicated-in-most-patients-with-an-estimated-glomerular-filtration-rate-egfr-of-less-than-45-ml-min-1-73m2**
6. Scottish Antimicrobial Prescribing Group (SAPG). Guidance on management of recurrent urinary tract infection in non-pregnant women. 2016 Jun **https://www.scottishmedicines.org.uk/files/sapg1/Management_of_recurrent_lower_UTI_in_non-pregnant_women.pdf**
7. Lee BS et al, 2012. Cochrane review of methenamine hippurate for prevention of UTIs. **http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003265.pub3/epdf**
8. Grin PM et al. Lactobacillus for preventing recurrent urinary tract infections in women: meta-analysis. Can J Urol. 2013 Feb;20(1):6607-14.PM et al, 2013. **https://www.researchgate.net/publication/235714595_Lactobacillus_for_preventing_recurrent_urinary_tract_infections_in_women_Meta-analysis**

Urinary Tract Infections – Acute Pyelonephritis (Upper UTI)

When to treat	Upper urinary tract infection is defined as: evidence of urinary tract infection with symptoms suggestive of pyelonephritis (loin pain, flank tenderness, fever, rigors or other manifestations of systemic inflammatory response).[1] Upper urinary tract infection can be accompanied by bacteraemia, making it a life threatening infection.[1]
	Admit to hospital people who:[2]
	• Are significantly dehydrated or who are unable to take oral fluids and medications.
	• Have signs of sepsis*, including:
	  • Marked signs of illness (such as impaired level of consciousness, perfuse sweating, rigors, pallor, significantly reduced mobility), or have
	  • Significant tachycardia, hypotension, or breathlessness.
	• Are pregnant and pyrexial.
	• Fail to improve significantly within 24 hours of starting antibiotics.
	*See Sepsis guide
	Consider admitting frail, elderly residents in care homes who have recently been hospitalised or who have had recurrent UTI (benefits vs risks/need for care plan)

When to investigate	Dipstick test the urine for leucocyte esterase and nitrite in non-catheterised patients 18-70y for evidence of a UTI. [Dipstick testing is less helpful in older patients or catheterised patients; who are more likely to have pre-existing asymptomatic bacteriuria]. • If the nitrite test is positive, with or without a positive leucocyte esterase test, a UTI is highly (90%) likely. • If the leucocyte esterase test alone is positive, a UTI is moderately (50%) likely. • If both nitrites and leucocytes are negative, 40-50% of patients will not have culture-positive UTI. Consider and exclude other causes of loin pain and/or fever including: pelvic inflammatory disease; appendicitis; renal calculi. If admission not needed, send MSU for culture and susceptibility testing, and start antibiotics.[3] If no response within 24 hours, seek advice. If ESBL risk, hospitalisation or antibiotics in last 3 months, care home resident, age >65y, male gender][7] and on advice from a microbiologist, consider IV antibiotic via OPAT.[3]
How to respond to a positive lab report	Single organism ≥ 10^4 colony forming units (CFU)/mL or ≥ 10^5 mixed growth with one predominant organism or *E. coli* or *Staphylococcus saprophyticus* ≥ 10^3 CFU/mL usually indicates UTI in patient with urinary symptoms.[3] Review culture and sensitivity results when they become available, and change the antibiotic if indicated.[2] Check micro results for last 6 months and avoid antibiotics for which there has been recent resistance.
Treatment choices[6]	**First line:**[1,3,4*] ***Ciprofloxacin**[A-] 500mg *bd* for 7 days[A] ***OR*** ***Co-amoxiclav**[C] 625mg *tds* for 14 days[2,C] *If organism sensitive:* **Trimethoprim** 200mg *bd* for 14 days[1]
Cautions	*High-risk drugs for *Clostridium difficile* infection but benefits considered to outweigh risks in acute pyelonephritis.[3] Nitrofurantoin is an ***ineffective*** treatment for upper UTI because it does not achieve effective concentrations in the blood.[1]
Evidence[3,7]	A systematic review and meta-analysis of eight randomised controlled trials and 2,515 patients, which found that a shorter seven-day course of quinolones or beta-lactam antibiotics was as clinically effective as a 14-day course (RR 0.63; 95% CI 0.33 to 1.18; I2=41%). There was, however, no direct comparison of seven versus 14 days of trimethoprim or co-trimoxazole, so 14 days of treatment should be prescribed.
References	1. SIGN 88 UTI 2012 **http://www.sign.ac.uk/assets/sign88.pdf** Accessed Aug 2017) 2. Clinical Knowledge Summaries Pyelonephritis – acute **http://cks.nice.org.uk/pyelonephritis-acute** (accessed Aug 2017) 3. Management of Infection Guidance for Primary Care, PHE & BIA, July 2017 **Managing common infections: guidance for primary care - GOV.UK** 4. European Association of Urology. Guidelines on Urological Infections 2015. **http://uroweb.org/wp-content/uploads/19-Urological-infections_LR2.pdf** (Accessed Aug 2017) 5. Public Health England 2013. Acute trust toolkit for the early detection, management and control of carbapenemase-producing Enterobacteriaceae. **https://www.gov.uk/government/publications/carbapenemase-producing-enterobacteriaceae-early-detection-management-and-control-toolkit-for-acute-trusts** . 6. **https://www.gov.uk/government/publications/carbapenemase-producing-enterobacteriaceae-early-detection-management-and-control-toolkit-for-acute-trusts** 7. Eliakim-Raz N et al. J Antimicrob Chemother. 2013 Oct;68(10):2183-91. **https://www.ncbi.nlm.nih.gov/pubmed/23696620** 8. Ben-Ami R et al. A multinational survey of risk factors for infection with extended-spectrum beta-lactamase-producing enterobacteriaceae in nonhospitalized patients. *Clin Infect Dis.* 2009 Sep 1;49(5):682-90.

Genital Tract

Conditions

GTC

Genital Tract Conditions – Criteria for referring patients to specialist care	
Patient risk factors	Refer patents with the following risk factors for STIs to GUM/Sexual Health Services clinic or general practices with level 2 expertise in GUM/Sexual Health Services:[1,2,3] • <25yrs • No / inconsistent condom use • recent (<12mth) or frequent change of sexual partner • previous STI • symptomatic partner • MSM
Diseases	• Syphilis – always refer to GUM/Sexual Health Services • Gonorrhoea – always refer to GUM/Sexual Health Services • Genital Herpes – Treat on suspicion and refer to GUM/Sexual Health Services
Evidence	See Health Protection Agency and British Infection Association Quick Reference Guide to Management and Laboratory Diagnosis of Abnormal Vaginal Discharge for useful flowchart.[4]
References	1. British Association for Sexual Health and HIV Guidance 2013: Sexually Transmitted Infections in Primary Care. **https://www.bashhguidelines.org/media/1089/sexually-transmitted-infections-in-primary-care-2013.pdf** (Accessed Jan 2017) 2. Public Health England: National Chlamydia Screening Programme **https://www.gov.uk/government/collections/national-chlamydia-screening-programme-ncsp** (Accessed March 2017) 3. Public Health England: Management of infection guidance for primary care for consultation and local adaptation. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/591916/managing_common_infections.pdf** September 2017 4. Public Health England / British Infection Association: Management and laboratory diagnosis of Abnormal Vaginal Discharge Quick Reference Guide for Primary Care **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/345793/Vaginal_Discharge_treatment_guidance.pdf** (Reviewed July 2013. Accessed March 2017)

Genital Tract Conditions – Vulvovaginal Candidiasis

When to treat	Symptoms suggestive of episodic vulvovaginal candidiasis include external dysuria, vulval pruritus, swelling or redness. Signs include vulval oedema, fissures, excoriation, or thick curdy discharge.[1] The vaginal pH is usually normal (<4.5). Treatment on the basis of symptoms alone is common clinical practice but results in the over-treatment of a large number of women.[1] There is no evidence to support the treatment of asymptomatic male sexual partners in either episodic or recurrent vulvovaginal candidiasis.[2A]	
When to investigate	Microscopy and culture are not routinely done on women with features of typical acute uncomplicated vulvovaginal candidiasis.[3,4] Microscopy and speciation of a vaginal swab to identify yeasts is recommended for: supporting the diagnosis when this is uncertain; severe vulvovaginal candidiasis; treatment failure; recurrent vulvovaginal candidiasis.[3] Request 'fungal speciation of non- albicans *Candida* species' if there is unexplained treatment failure or recurrent infection.[3]	
General advice	Advise the woman to return if symptoms have not resolved within 7-14 days.[3] Refer, or seek specialist advice, if: symptoms are not improving and treatment failure is unexplained; treatment fails again; if diagnosis is unclear.[3] Avoid local irritants e.g. perfumed products.[2] Routine recommendation of use of vulval moisturisers (such as Cetraben cream) as soap substitute and regular skin conditioner (permission may need to be given to the patient that this does not constitute 'internal use').[2] Avoid tight fitting synthetic clothing.[2]	
Treatment choices	**First line non-pregnant**[2,5,6] C**lotrimazole**[A+] 10% Vaginal Cream (5g) stat ***OR* Clotrimazole**A[+] 500mg pessary stat at night ***OR* Miconazole** 2% Cream 5g inserted high into vagina once daily for 10-14 days or twice daily for 7 days ***OR* Fluconazole**[A+] 150mg orally stat **Recurrent (>4 episodes per year)** 150mg oral fluconazole every 72 hours for **three doses** (induction) followed by **ONE** dose of 150mg every week for **SIX months** (maintenance)[6]	**First line pregnant**[5] Avoid oral azoles [2,5,6] and use intravaginal treatment [6] **Miconazole** 2% Cream 5g inserted high into vagina once daily for 10-14 days or twice daily for 7 days
Cautions	There is evidence from a number of randomized controlled trials that vulval burning and vaginal discharge are more common with intravaginal imidazoles, whilst nausea, headache, and abdominal pain are more common with oral imidazoles.[3] Clotrimazole and miconazole damage latex condoms and diaphragms and inactivate spermicidal contraceptives.[3,7]	
Evidence	No statistically significant differences were observed in clinical cure rates of antifungals administered by the oral or the intravaginal route. At short-term follow-up, 74% cure was achieved with oral treatment and 73% cure with intra-vaginal treatment (OR 0.94, 95% CI 0.75 to 1.17).[5]	
References	1. White D, Vanthuyne A (2006) Vulvovaginal candidiasis. Sex Transmitted Infect. Dec; 82(Suppl 4): iv28–iv30 **http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2563903/** 2. British Association of Sexual Health and HIV: United Kingdom National Guideline on the Management of Vulvovaginal Candidiasis 2007. **https://www.bashhguidelines.org/media/1043/vvc-2007.pdf** (Accessed March 2017) 3. Clinical Knowledge Summaries: Candida (female genital). **http://cks.nice.org.uk/candida-female-genital** (Revised May 2017. Accessed September 2017) 4. Public Health England / British Infection Association: Management and laboratory diagnosis of Abnormal Vaginal Discharge Quick Reference Guide for Primary Care **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/345793/Vaginal_Discharge_treatment_guidance.pdf** (Reviewed July 2013. Accessed March 2017) 5. British Association of Sexual Health and HIV 2006. Sexually Transmitted Infections: UK National Screening and Testing Guidelines. **https://www.bashh.org/documents/59/59.pdf** (Accessed March 2017) 6. Public Health England: Management of infection guidance for primary care for consultation and local adaptation. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/591916/managing_common_infections.pdf** (Revised September 2017) 7. Joint Formulary Committee 2016. 7.6.1a *Vaginal and vulval bacterial infections*: British National Formulary. 72nd ed. London: BMJ Group and Pharmaceutical Press.	

Genital Tract Conditions – Bacterial Vaginosis

When to treat

Treatment is indicated for: symptomatic women (offensive fishy-smelling vaginal discharge, not associated with soreness, itching, or irritation)[A]; women undergoing some surgical procedures[A]; and some pregnant women.[1]
Symptomatic pregnant women should be treated in the usual way[B] and asymptomatic pregnant women may be considered for treatment.[1] Routine screening and treatment of male partners is not indicated. Treating partners does not reduce relapse.[1,2]

When to investigate

Examination and further tests may be omitted and empirical treatment for bacterial vaginosis (BV) started in women with characteristic symptoms of BV if all of the following apply[2]:

- The woman is not at high risk of a sexually transmitted infection (STI).
- The woman does not have symptoms of other conditions causing vaginal discharge (e.g. itch, abdominal pain, abnormal bleeding, dyspareunia, fever).
- The woman is not pregnant, post-natal, post-miscarriage, or post-termination.
- Symptoms have not developed after a gynaecological procedure.
- Symptoms have not recurred soon after treatment for BV or persisted following treatment for BV.

If empirical treatment is not considered appropriate, or if the diagnosis is uncertain[2]:

- Perform a speculum examination.
- If pH paper is available, test the pH of the vaginal fluid (pH > 4.5 is consistent with a diagnosis of BV).[3]
- Take a high vaginal swab (or use a self-taken low vaginal swab) for Gram staining and to exclude other causes of vaginal discharge.

General advice

Advise patients to avoid vaginal douching, use of perfumed products, and use of antiseptic agents or shampoo in the bath.[1C]

Treatment choices

First Line:[1,2,4,5]
Metronidazole 400mg oral *bd* for 7 days[A+], (preferred over 2g stat for efficacy and also in pregnancy)[5]
***OR* Metronidazole** 2g stat [A+] (consider suspension formulation at night for better tolerability; avoid 2g dose in pregnancy)[5]
***OR* Metronidazole** 0.75% vaginal gel 5g applicatorful at night for 5 days [A+]
***OR* Clindamycin** 2% vaginal cream, 5g applicatorful at night for 7 days [A+]

Cautions

Clindamycin cream weakens condoms – advise against use during treatment.[1]

Evidence

All treatments have been shown to have cure rates of 70-80%.[1A] 7 day course of oral metronidazole results in fewer relapses than 2g stat at four weeks.[4A]
Topical treatment gives similar cure rates[A+] but is more expensive.

References

1. British Association of Sexual Health and HIV: UK National Guideline for the management of Bacterial Vaginosis 2012. **https://www.bashhguidelines.org/media/1041/bv-2012.pdf** (Accessed March 2017)
2. Clinical Knowledge Summaries: Bacterial Vaginosis **https://cks.nice.org.uk/bacterial-vaginosis** (Revised July 2014. Accessed March 2017)
3. Public Health England / British Infection Association: Management and laboratory diagnosis of Abnormal Vaginal Discharge Quick Reference Guide for Primary Care **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/345793/Vaginal_Discharge_treatment_guidance.pdf** (Reviewed July 2013. Accessed March 2017)
4. Public Health England: Management of infection guidance for primary care for consultation and local adaptation. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/591916/managing_common_infections.pdf** (Revised September 2017)
5. UK Teratology Information Service. Use of metronidazole in pregnancy. 2008. (Tel: 0344 892 0111) **www.toxbase.org** (Accessed March 2017)

Genital Tract Conditions – Chlamydia Trachomatis

When to treat	In people with signs or symptoms strongly suggestive of Chlamydia, start treatment without waiting for laboratory confirmation (after testing for other sexually transmitted infections as appropriate).[1] In the absence of treatment, 10-40% of infected women will develop pelvic inflammatory disease (PID).[2]	
When to investigate	Test for Chlamydia if patients are sexually active with symptoms and signs suggesting Chlamydia.[1] Opportunistically screen all aged 15-25yrs.[3] Repeat test for cure in all at three months.[4]	
How to respond to a positive lab result	Treat partners and refer to GUM service.[4B+] Positive confirmed reactive nucleic acid amplification technique (NAAT) test. Note: In high-risk populations, tests are not confirmed with culture. Beware of false positive test results in low-risk populations.[D] Patients with reactive unconfirmed NAAT test results should also be offered treatment.[2]	
General advice	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).[2]	
Treatment choices	**First line: (non-pregnant)**[1,2,3,4] **Azithromycin** 1g stat[A+] ***OR* Doxycycline** 100mg *bd* for 7 days[A+]	**First line: Pregnant or breastfeeding**[1,2,4,5] **Azithromycin** 1g stat[A+] (off-label use)[1,2,3,4] ***OR* Erythromycin**[A+] 500mg *bd* for 14 days[5] ***OR* Amoxicillin** 500mg *tds* for 7 days (off-label use)
Cautions	**Refer all pregnant patients to GUM/Sexual Health Services.**[1,2] Pregnancy or breastfeeding: azithromycin is the most effective option.[4A+] As lower cure rate in pregnancy, test for cure at least 3 weeks after end of treatment.[2,4A+]	
Evidence	NAATs are more sensitive and specific (90-95%) than enzyme immunoassays (EIAs) (40-70%). Comparative studies of doxycycline and azithromycin have shown similar efficacy at 2-5 week follow-up, with >97% being Chlamydia- negative on retesting.[2] However, there is evidence to suggest that with longer follow-up >10% will be positive on retesting (NAATs may remain positive for up to 5 weeks, even if treatment has been successful).[2] Erythromycin and amoxicillin are less effective than doxycycline or azithromycin.[1,2,4]	
References	1. Clinical Knowledge Summaries: Chlamydia – uncomplicated genital 2016. **https://cks.nice.org.uk/chlamydia-uncomplicated-genital** (Accessed August 2017) 2. British Association of Sexual Health and HIV 2015 UK national guideline for the management of infection with Chlamydia trachomatis **https://www.bashhguidelines.org/media/1045/chlamydia-2015.pdf** (Accessed August 2017) 3. SIGN 109 Management of genital Chlamydia trachomatis infection 2009 4. Public Health England: Management of infection guidance for primary care for consultation and local adaptation. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/591916/managing_common_infections.pdf** (Revised September 2017) 5. UK Teratology Information Service. Azithromycin in pregnancy. (Tel: 0344 892 0909) **www.toxbase.org** (Accessed March 2017) 6. British National Formulary (online) London: BMJ Group and Pharmaceutical Press: Erythromycin (Accessed March 2017)	

Genital Tract Conditions – Trichomoniasis

When to treat	Treat only laboratory confirmed diagnosis.[1] Patients with *T. vaginalis* seen on cytology should have lab confirmation before treatment. Sexual partner(s) should be treated simultaneously.[2,3] Refer to GUM/Sexual Health Services clinic.[3] Oral treatment needed as extravaginal infection common.[3]	
When to investigate	All symptomatic patients.[4] Yellow, green frothy discharge. Fishy/offensive odour +/- pruritis, vaginitis, dysuria.[5] Screening of asymptomatic patients is not recommended.[4] Screening for co-existent sexually transmitted infections should be undertaken in both men and women.[2,3]	
General advice	Patients should be advised to avoid sexual intercourse (including oral sex) until they and their partner(s) have completed treatment and follow-up.[2]	
Treatment choices	**First line:** **Metronidazole**[A+] 400mg *bd* for 5-7days[3] ***OR* Metronidazole** 2g stat[3A+] (consider suspension formulation at night for better tolerability[D]; avoid 2g dose in pregnancy/breastfeeding[3])	**Symptomatic relief (not cure) if metronidazole declined:**[3] **Clotrimazole** pessary[B+] 100mg each night for 6 nights
Cautions	The single dose has the advantage of improved compliance and being cheaper; however there is some evidence to suggest that the failure rate is higher with single dose, especially if partners are not treated concurrently.[2]	
Evidence	Treating partners does not reduce relapse.[5B+] Most strains of *T. vaginalis* are highly susceptible to metronidazole and related drugs (approx. 95% cure rate). There is a spontaneous cure rate in the order of 20-25%.[2]	
References	1. Clinical Knowledge Summaries: Trichomoniasis **https://cks.nice.org.uk/trichomoniasis** (Revised March 2015. Accessed March 2017) 2. British Association for Sexual Health and HIV: United Kingdom National Guideline on the Management of Trichomonas vaginalis 2014. **https://www.bashh.org/documents/UK%20national%20guideline%20on%20the%20management%20of%20TV%20%202014.pdf** (Accessed March 2017) 3. Public Health England: Management of infection guidance for primary care for consultation and local adaptation. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/591916/managing_common_infections.pdf** (Revised September 2017) 4. British Association of Sexual Health and HIV. Sexually Transmitted Infections in Primary Care 2013. **http://www.bashh.org/documents/Sexually%20Transmitted%20Infections%20in%20Primary%20Care%202013.pdf** (Accessed March 2017) 5. Public Health England / British Infection Association: Management and laboratory diagnosis of Abnormal Vaginal Discharge Quick Reference Guide for Primary Care **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/345793/Vaginal_Discharge_treatment_guidance.pdf** (Reviewed July 2013. Accessed March 2017)	

Genital Tract Conditions – Pelvic Inflammatory Disease (PID)

When to treat	Signs include: lower abdominal tenderness which is usually bilateral; adnexal tenderness on bimanual vaginal examination; cervical motion tenderness on bimanual vaginal examination; fever (>38°C).[1] Delaying treatment may increase the risk of long term sequelae such as ectopic pregnancy, infertility and pelvic pain.[1] Because of this, and the lack of definitive diagnostic criteria, a low threshold for empiric treatment of PID is recommended.[1] Start treatment and refer woman & contacts to GUM service.[2]	
When to investigate	Always test for gonorrhoea and chlamydia as positive result supports PID diagnosis.[1,3] However, a negative result does not exclude PID.[1] All patients should be offered a pregnancy test when required to exclude pregnancy.[1] Refer woman & contacts to GUM service to screen for sexually transmitted infections.[2]	
General advice	BASHH Patient information leaflet: **https://www.bashhguidelines.org/media/1034/pid-pil-2015-screen-friendly.pdf** Rest is advised for those with severe disease.[1C] Appropriate analgesia should be provided.[1C] Patients should be advised to avoid unprotected intercourse until they, and their partner(s), have completed treatment and follow-up.[1C]	
Treatment choices[3]	If low risk of Gonococcal infection[A+] **Metronidazole** 400mg *bd* ***PLUS:*** **Ofloxacin** 400mg *bd*[A+] All for 14 days	If high risk of Gonococcal infection[B+] (partner has it, severe symptoms, sex abroad) **Ceftriaxone** 500mg **IM stat**[C] (seek expert advice if history of severe penicillin allergy) ***PLUS:*** **Metronidazole** 400mg *bd* ***PLUS:*** **Doxycycline**100mg *bd.* Both for 14 days
Cautions	PID in pregnancy requires parenteral treatment – refer to specialist.[1] **Ceftriaxone** is supplied as a powder which needs to be reconstituted with lidocaine solution. To reconstitute, mix the contents of a 1g vial with 3.5mL of 1% lidocaine injection BP: Half (2mL) of the resulting solution provides 500mg ceftriaxone. It should be given by deep intramuscular injection.[4] M**etronidazole** is included in some regimens to improve coverage for anaerobic bacteria.[1] Anaerobes are of relatively greater importance in patients with severe PID and metronidazole may be discontinued in those patients with mild or moderate PID who are unable to tolerate it.[1]	
Evidence	Use ceftriaxone regime if gonorrhoea likely as resistance to quinolones is high, 25% of gonorrhoea isolates in 2014 were resistant to ciprofloxacin.[3]	
References	1. British Association for Sexual Health and HIV: UK National Guideline for the Management of Pelvic Inflammatory Disease 2011. **https://www.bashh.org/documents/3572.pdf** (Accessed March 2017) 2. Clinical Knowledge Summaries: Pelvic Inflammatory Disease **https://cks.nice.org.uk/pelvic-inflammatory-disease** (Revised April 2015)(Accessed March 2017) 3. Public Health England: Management of infection guidance for primary care for consultation and local adaptation. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/591916/managing_common_infections.pdf** (Revised September 2017) 4. Summary of Product Characteristics– Ceftriaxone 1g. Wockhardt UK Ltd. **http://www.medicines.org.uk/emc/medicine/5469** (Accessed March 2017. SPC last updated on eMC on 14/12/2015)	

Genital Tract Conditions – Acute Prostatitis

When to treat	Acute prostatitis should be suspected in a man who presents with a feverish illness of sudden onset; irritative urinary voiding symptoms or acute urinary retention; perineal or suprapubic pain; exquisitely tender prostate on rectal examination.[1] Empirical therapy should be started immediately after urine cultures have been obtained.	
When to investigate	All patients >35 years need mid-stream urine sample for dipstick testing and culture for bacteria and antibiotic sensitivity.[1] (An STI is much more likely in men <35 years. Send first-catch urine for NAATs).[2] Admit to hospital if the man is unable to take oral antibiotics, has acute urinary retention or is severely ill.[1] Refer urgently if the man has a pre-existing urological condition and consider urgent referral if the man has diabetes or is immunocompromised.[1]	
How to respond to a positive lab result	Reassess after 24-48 hours: Review the culture results and ensure that an appropriate antibiotic is being used.[1] If there is deterioration or failure to respond to oral therapy, urgent admission and parenteral therapy should be arranged;[1] prostatic abscess may need to be excluded or treated.[1] Treatment of sexual partners is not required.[2]	
General advice	Adequate hydration should be maintained, rest encouraged and analgesics such as non-steroidal anti-inflammatory drugs if required.[1] Most men treated appropriately for acute prostatitis will recover completely within 2 weeks (but treatment should be continued for at least a further 2 weeks).[1] Following recovery, refer for investigation to exclude structural abnormality of the urinary tract.[1]	
Treatment choices	**First line:**[3] **Ciprofloxacin*** 500mg *bd* for 28 days ***OR* Ofloxacin*** 200mg *bd* for 28 days *High-risk drug for *Clostridium difficile* infection and should be avoided in at-risk patients.	**Second line or if allergic to quinolones:**[3] **Trimethoprim** 200mg *bd* for 28 days
Cautions	Avoid quinolones in people with a history of tendon disorders related to quinolones, or a history of seizures or conditions that predispose to seizures.[4]	
Evidence	Quinolones achieve higher prostate levels than trimethoprim.[3] UK guidelines recommend treatment for at least 4 weeks to prevent the development of chronic prostatitis.[1]	
References	1. Clinical Knowledge Summaries: Acute prostatitis **https://cks.nice.org.uk/prostatitis-acute** (Revised August 2014. Accessed Sept 2017) 2. British Association for Sexual Health and HIV: UK national guideline for the management of infection with Chlamydia trachomatis 2015. **https://www.bashhguidelines.org/media/1045/chlamydia-2015.pdf** (Accessed March 2017) 3. Public Health England: Management of infection guidance for primary care for consultation and local adaptation. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/591916/managing_common_infections.pdf** (Revised September 2017) 4. British National Formulary (online) London: BMJ Group and Pharmaceutical Press – Ciprofloxacin (Accessed March 2017)	

Genital Tract Conditions – Balanitis

When to treat	When this condition is suspected or where symptoms are troublesome or do not resolve with good hygiene.	
When to investigate	A sub-preputial swab is not necessary to make a diagnosis, but can be useful for identifying the underlying cause. Take a sub-preputial swab if balanitis is severe, recurrent or persists despite treatment. Check blood glucose levels or urine for glycosuria if balanitis is severe, persistent, or recurrent (especially if Candidal balanitis is present). Only swab for *Gardnerella*-associated balanitis if this is suspected clinically. If penile cancer is suspected, refer urgently to genitourinary medicine (GUM) or urology. If ulceration, urethritis or inguinal lymphadenopathy is present refer to GUM. If balanitis is recurrent and associated with inability to retract the foreskin refer to urology.[2] If balanitis is recurrent and no underlying cause can be identified, or balanitis persists despite treatment, refer to GUM or urology, depending on the most likely underlying cause.	
How to respond to a positive lab result	If symptoms are worsening or do not start to improve within 7 days, advise patient to stop hydrocortisone, if prescribed, and take a sub-preputial swab (if not already done) to exclude or confirm a fungal or bacterial infection, and adjust treatment (if indicated), or seek specialist advice.[2] Screening should be offered to partners where a sexually transmissible agent is found.[1]	
General advice[2]	Advise daily cleaning under the foreskin with lukewarm water, followed by gentle drying. Soap or other irritants should not be used on the genitalia. Consider prescribing an emollient (such as emulsifying ointment) as a soap substitute.	
Treatment choices	**For suspected non-specific dermatitis, with or without candidal colonization:**[2] **Clotrimazole** 1% or **Miconazol**e 2% cream *bd* until symptoms settle ***OR*** oral **Fluconazole** 150mg stat if severe symptoms.	**If suspected / confirmed *Garnerella*-associated:**[2] **Metronidazole** 400mg *bd* for 7 days **If suspected / confirmed Streptococcal balanitis:**[2] **Flucloxacillin** 500mg qds for 7 days[2] ***OR*** if penicillin allergic: **Clarithromycin** 250mg bd for 7 days[2] ***OR*** according to reported sensitivities.[3]
	If inflammation is causing discomfort consider prescribing Hydrocortisone 1% cream or ointment for up to 14 days in addition to treatment.[2]	
Cautions	Advise about effect on condoms if creams are being applied.[1]	
Evidence	Oral fluconazole was preferred to topical treatment by approximately 80% of men.[2] Testing and treating partners who have a proven candidal or Gardnerella infection will prevent reinfection and recurrent balanitis.[2]	
References	1. British Association of Sexual Health and HIV 2008. UK National Guideline on the Management of Balanoposthitis **https://www.bashh.org/documents/2062.pdf** (Accessed March 2017) 2. Clinical Knowledge Summaries: Balanitis: **https://cks.nice.org.uk/balanitis** (Revised July 2015. Accessed March 2017) 3. Sexually Transmitted Infections in Primary Care 2013 (British Association for Sexual Health and HIV (BASHH)) **https://www.bashh.org/documents/Sexually%20Transmitted%20Infections%20in%20Primary%20Care%202013.pdf** (accessed September 2017))	

Genital Tract Conditions – Epididymo-Orchitis

When to treat	Have a very low threshold for admitting immediately to exclude testicular torsion.[1] Consider other causes, such as mumps orchitis (may be parotid swelling), Behçet's syndrome (if recurrent epididymitis), tuberculosis, and amiodarone.[2,3] If symptoms are severe or the man or boy is very unwell, consider admitting to hospital, particularly if he has diabetes or is immunocompromised.[1] Ideally refer for same-day or next-day assessment by a sexual health specialist.[1] If this is not possible: Obtain a mid-steam urine for dipstick, microscopy, and culture and test for sexually transmitted infections.[2] Empirical therapy should be given to all patients with epididymo-orchitis before laboratory results are available.[2]	
When to investigate	All patients with sexually transmitted epididymo-orchitis should be screened for other sexually transmitted infections.[2] If a urinary tract infection is confirmed, refer to a urologist to investigate for an underlying structural abnormality or urinary tract obstruction.[1]	
How to respond to a positive lab result	Tailor treatment according to culture and sensitivity results. If the patient was gonorrhoea positive, they should be referred to a GUM clinic.	
General advice	Bed rest, scrotal elevation (such as with supportive underwear), and analgesia.[1] If symptoms worsen, or do not begin to improve within 3 days, return for reassessment.[1]	
Treatment choices	**If sexually transmitted organism related, including gonorrhoea:**[4] **Ceftriaxone*** 500mg stat IM *(See PID monograph for reconstitution and administration)* ***PLUS*** **Doxycycline** 100mg *bd* for 14 days No intercourse until review. Notify partner.	**Most probably due to chlamydia or other non-gonococcal organism** (no risk factors for gonorrhoea) consider:[4] **Doxycycline** 100mg *bd* for 14 days ***OR*** **Ofloxacin*** 200mg *bd* for 14 days No intercourse until review. Notify partner
	All causes, but patient is allergic to tetracyclines and/or cephalosporins:[2] **Ofloxacin*** 200mg *bd* for 14 days	**If due to an enteric organism (for example, *Escherichia coli*):**[4] **Ofloxacin*** 200mg *bd* for 14 days ***OR*** **Ciprofloxacin*** 500mg *bd* 10 days
Cautions	*High-risk drug for *Clostridium difficile* infection and should be avoided in at-risk patients. Avoid quinolones in people with a history of tendon disorders related to quinolones, or a history of seizures or conditions that predispose to seizures.[1]	
Evidence	Cefixime 400mg oral as a single dose may be an alternative to ceftriaxone where IM route is contraindicated or refused.[5] Observations in Asia have raised concern over the adequacy of 400mg cefixime for the treatment of genital gonorrhoea.[5]	
References	1. Clinical Knowledge Summaries: Scrotal swellings **https://cks.nice.org.uk/scrotal-swellings** (Revised April 2017. Accessed September 2017) 2. British Association of Sexual Health and HIV. 2010. United Kingdom national guideline for the management of epididymo-orchitis **https://www.bashh.org/documents/3546.pdf** (Accessed March 2017) 3. Amiodarone SPC **Amiodarone 200mg Tablets – Summary of Product Characteristics (SPC) - (eMC)** 4. British Association of Sexual Health and HIV 2011. Clinical care pathway for management of epididymo-orchitis **https://www.bashh.org/documents/3547.pdf** (Accessed March 2017) 5. British Association of Sexual Health and HIV 2011. UK National Guideline for the Management of Gonorrhoea in Adults **https://www.bashh.org/documents/3920.pdf** (Accessed March 2017)	

Genital Tract Conditions – Genital Herpes

When to treat	Oral antiviral drugs are indicated within five days of the start of the first episode, while new lesions are still forming, or if systemic symptoms persist.[1] Self-initiated treatment should be considered for recurrent episodes, so antiviral medication can be started early in the next attack.[2]	
When to refer[2]	Referral should be considered in the following circumstances: • Women who are pregnant • Immunocompromised people (people with HIV can treated in primary care provided that the infection is uncomplicated and not severe). • There is no response to treatment (e.g. of lesions are still forming after 3-5 days of treatment). • People with herpetic proctitis, severe local secondary infection, complications (such as urinary retention) and systemic herpes infection such as meningitis.	
When to investigate[1,2]	Ideally, all people with suspected genital herpes should be referred to a specialist in genito-urinary medicine (GUM) for diagnosis, treatment, screening for STIs, counselling, and follow-up. If this is not possible or acceptable, the person can be managed in primary care if the appropriate expertise is available. Take a swab from the base of a lesion (pop blister if necessary) for viral culture, or polymerase chain reaction (PCR) depending on local arrangements. Also consider screening for other STIs, the possibility of pregnancy, HIV or immunosuppression.	
General advice[1,2,3]	Advise saline bathing, oral analgesia, topical anaesthetic agents (lidocaine 5% ointment) especially prior to micturition.[1,3] Advise abstinence from sexual intercourse (including non-penetrative and oro-genital sex) until follow-up or lesions have cleared.[2]	
Treatment choices	**First episode:** First line: **Aciclovir** oral 400mg *tds* for **5** days [A+] Second line: **Valaciclovir** 500mg *bd* for **5** days ***OR*** **Famciclovir** 250mg *tds* for **5** days [A+]	**Recurrent episodes:** Self-care if mild. Short immediate treatment First line: **Aciclovir** oral 800mg *tds* for 2 days [A+] Second line: **Famciclovir** 1g *bd* for 1 day [A+] Suppressive antiviral treatment if attacks are frequent (six or more attacks per year): **Aciclovir** 400mg *bd* for maximum of 12 months[2,5]
Cautions	Topical agents are less effective than oral agents, and combining oral and topical treatment is of no additional benefit over oral treatment alone.[1,4]	
Evidence	BASHH recommends five days of antiviral treatment for primary genital HSV, as there is no evidence of benefit for treatment longer than this period.[1] There is no evidence of a difference in efficacy, tolerability, or toxicity between aciclovir, valaciclovir, or famciclovir in the management of primary genital herpes.[4,5] CKS recommends that oral aciclovir should be prescribed first-line, as it is the least expensive option.[2]	
References	1. British Association for Sexual Health and HIV (BASHH). 2014 UK national guideline for the management of anogenital herpes. 2014 Aug. **https://www.bashh.org/documents/HSV%20Final%20guidelines%20with%20ref%20sorted.pdf** 2. Clinical Knowledge Summaries (CKS). Herpes simplex – genital. Revised April 2017 **Herpes simplex - genital - NICE CKS** 3. Public Health England: Management of infection guidance for primary care for consultation and local adaptation. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/591916/managing_common_infections.pdf** (Revised September 2017) 4. Heslop R, Roberts H, Flower D, Jordan V. Interventions for men and women with their first episode of genital herpes (Review). Cochrane Database Syst Rev. 2016 Aug; 30(8):1-171. Available from: **http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD010684.pub2/epdf** 5.Le Cleach L, Trinquart L, Do G, Meruani A, Lebrun-Vignes B, Ravaud P et al. Oral antiviral therapy for prevention of genital herpes outbreaks in immunocompetent and nonpregnant patients (Review). Cochrane Database Syst Rev. 2014 Aug; 8:1-112. Available from: **http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD009036.pub2/epdf**	

Genital Tract Conditions – Bartholin's Cyst	
When to treat	Refer to secondary care
Genital Tract Conditions – post TOP Endometritis	
When to treat	Refer to treating Consultant
Genital Tract Conditions – Gonorrhoea	
When to treat[1]	Antibiotic resistance is now very high. Use IM ceftriaxone and oral azithromycin, refer to GUM and test of cure is essential. **Ceftriaxone** is supplied as a powder which needs to be reconstituted with lidocaine solution. To reconstitute, mix the contents of a 1g vial with 3.5mL of 1% lidocaine injection BP: Half (2mL) of the resulting solution provides 500mg ceftriaxone. It should be given by deep intramuscular injection.[2]
Treatment Choices[1]	**Ceftriaxone** 500mg **IM stat**[C] (seek expert advice if history of severe penicillin allergy) ***PLUS*** **Azithromycin** 1g **oral stat**
References	1. Public Health England: Management of infection guidance for primary care for consultation and local adaptation. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/591916/managing_common_infections.pdf** (September 2017) 2. Summary of Product Characteristics– Ceftriaxone 1g. Wockhardt UK Ltd. . **http://www.medicines.org.uk/emc/medicine/5469** (Accessed March 2017. SPC last updated on eMC on 14/12/2015)

Gastro-intestinal
Infections

Gastro-intestinal Infections – Eradication of *Helicobacter pylori*

When to treat: test and treat approach[1,2]

Patients 55 and older, with recent onset, unexplained & persistent (over 4-6 weeks) dyspepsia, should be referred urgently for endoscopy, to exclude cancer[1,3,4] otherwise the presence of *H. pylori* (HP) should be confirmed by Stool helicobacter antigen test (SAT) or Urea breath test (UBT) before starting eradication therapy.[1,2]

Test in the following situations[1,2]:

- Patients with uncomplicated dyspepsia unresponsive to lifestyle change, antacids single course of PPI for 1 month and without alarm symptoms
- Patients with a past history of gastric ulcer (GU) or duodenal ulcer (DU) who have not previously been tested
- Patients before starting or taking NSAIDs especially if a prior history of gastro-duodenal ulcers
- Patients with unexplained iron-deficiency anaemia, idiopathic thrombocytopenic and vitamin B12 deficiency

Do not test or offer eradication for gastro-oesophageal reflux disease (GORD) or to children with functional dyspepsia.

When to investigate

- Test eligible patients for HP (see above) using a SAT. A UBT may be available if following endoscopy.
- Do not perform SAT or UBT within at least 2 weeks of PPI or 4 weeks of antibiotics
- Patients testing negative – reassure as NPV is >95%. Treat as functional dyspepsia with low dose PPI or H2A for one month, then as required.

Consider re-testing for HP[1], preferably by UBT, but SAT is an alternative[1],.
Withhold re-testing for at least 2 weeks after PPI or 4 weeks after antibiotic/ bismuth[2] treatment.

- If poor compliance or local high resistance rates
- Patients with complicated peptic ulcer or MALTOMA
- Patients requiring aspirin or NSAID in whom a PPI is not co-prescribed
- Family history of gastric cancer
- Patients with severe recurrent symptoms after initial improvement with HP eradication and which are not typical of GORD

In eradication failure, re-assess need for HP treatment.

- In GORD or NUD patients with no family history of cancer of PUD, PPI maintenance may be appropriate, after discussion with patient

Refer for Helicobacter culture and susceptibility testing at endoscopy[1]:

- Patients in whom choice of antibiotic is limited by allergy, high local resistance or previous use within one year
- Patients who have received two courses of antibiotic treatment and remain HP positive.

General advice

- Check antibiotic history – as each additional course of clarithromycin (CL),metronidazole (MZ) or quinolone increases resistance risk
- Check penicillin allergy status, confirm nature of reaction
- Stress importance of compliance to increase eradication rates

Treatment choices

No penicillin allergy:
First-line: Triple-therapy regimen with twice daily dosing for **7** days[1]
PPI: **Lansoprazole** 30mg *BD* ***OR*** **Omeprazole** 20-40mg *BD* ***OR*** **Pantoprazole** 40mg *BD* ***OR*** **Esomeprazole** 20mg *BD* ***OR*** **Rabeprazole** 20mg *BD* ***PLUS*** 2 antibiotics (not previously used):
Either **Amoxicillin** 1g and **Clarithromycin (CL)** 500mg *BD*
OR **Amoxicillin** 1g and **Metronidazole (MZ)** 400mg *BD*

No penicillin allergy:
Ongoing symptoms after first line:
PPI ***PLUS*** **Amoxicillin** ***PLUS*** antibiotic not used first-line for **7** days
Ongoing symptoms after first line with previous exposure to CL and MZ:
PPI ***PLUS*** **Amoxicillin** ***PLUS*** **Tetracycline** 500mg QDS ***OR*** **Levofloxacin** 250mg *BD* for **10** days.

Penicillin-allergic:
First-line: PPI twice-daily ***PLUS*** **CL** 500 mg *BD* ***PLUS*** **MZ** 400 mg *BD* for **7** days
If previous exposure to CL or ongoing symptoms after first-line
Second-line: PPI twice-daily ***PLUS*** **MZ** 400 mg *BD* ***PLUS*** **Levofloxacin** 250 mg *BD* for **10** days

Penicillin-allergic:
If previous exposure to levofloxacin and on-going symptoms after first-line
Second-line:
PPI twice daily ***PLUS*** **bismuth subsalicylate** 525 mg QDS ***PLUS*** **Tetracycline** 500 mg QDS ***PLUS*** **MZ** 400mg *BD* for **7** days

continued overleaf

Gastro-intestinal Infections – Eradication of *Helicobacter pylori* *(continued)*

Cautions	If diarrhoea develops, consider Clostridium difficile infection and review need for treatment.[1]
Evidence	Helicobacter test and treat strategies will benefit patients with ulcer disease. Eradication rate is about 85%.[1,4] Increasing the duration of PPI-based triple therapy to 14 days, increases HP eradication rates4 but adverse effects and poor compliance may limit its usefulness.[4]
References	1. Test and treat for Helicobacter pylori in dyspepsia – Quick reference guide for primary care. PHE 2017 **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/560852/Hellicobacter_pylori_quick_reference_guide.pdf** (accessed August 2017) **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/601121/Helicobacter_pylori_quick_reference_guide.pdf** 2. Malfertheiner P et al., the European Helicobacter Study Group. Management of Helicobacter pylori infection – the Maastricht V / Florence Consensus Report. Gut 2017;66:6-30 **http://gut.bmj.com/content/66/1/6.full.pdf+html?sid=aaa8a635-3394-433a-a977-c1d45fe0897a** 3. NICE Clinical Guideline no. 184: Dyspepsia and gastro-oesophageal reflux disease: investigation and management of dyspepsia, symptoms suggestive of gastro-oesophageal reflux disease or both. September 2014 **https://www.nice.org.uk/guidance/cg184** (accessed 6 December 2016) Gastro-oesophageal reflux disease and dyspepsia in adults: investigation and management | Guidance and guidelines | NICE 4. BNF December 2016 (accessed 8 December 2016)

Gastro-intestinal Infections – Infectious Diarrhoea

When to treat	Definition of acute diarrhoea: 3 or more episodes a day, <14d and sample takes shape of pot.[1] Empirical treatment for patients well enough to be managed in primary care is not usually recommended because the majority of illnesses seen in the community do not have an identifiable bacterial cause.[2] If *Campylobacter* is strongly suspected as the cause of diarrhoea (e.g. undercooked meat and abdominal pain), consider empirical treatment with clarithromycin if treating early (within 3 days).[2] Urgently refer all previously healthy children with acute painful, bloody diarrhoea or confirmed *E. coli* O157.[1]
When to investigate	Send a stool specimen for culture and sensitivity if: • systemically unwell; blood or pus in the stool; • it is necessary to exclude other pathologies; immunocompromised; • diarrhoea occurs after high risk foreign travel (also request tests for ova, cysts, and parasites); • recent antibiotics or hospitalisation (also request *C. difficile*); • diarrhoea is persistent (e.g. >1week).[3] Consider Bristol stool chart types 5-7, that is not clearly attributable to an underlying cause (e.g. laxatives).[4] If the diarrhoea has stopped, culture is rarely indicated, as recovery of the pathogen is unlikely.[1] Consider blood tests if infection and other causes of acute diarrhoea excluded and a chronic cause is suspected.[3] Consult local HPU if: Suspected public health hazard; outbreaks of diarrhoea in the family or community; infected with certain organisms (e.g. *E. coli* O157) where there may be serious clinical sequelae to an infection.[3]
How to respond to a positive lab result	Most patients in whom pathogens are detected will **NOT** require specific treatment unless systemically unwell or treatment is advised by a microbiologist or consultant in communicable disease control. ***Campylobacter:*** Antibiotic therapy has little effect on duration of symptoms unless given very early in illness course. ***Giardia lamblia* and *Entamoeba histolytica*** should be treated according to sensitivity results. Unless symptoms persist, ***Blastocystis* and *Dientamoeba fragilis*** do not usually require treatment if otherwise healthy. ***Salmonella* and *Shigella:*** treat according to sensitivities, empirical prescribing not recommended as resistance rates are often high. Most patients in whom pathogens including salmonella and shigella are detected will not require specific treatment unless systemically unwell or treatment is advised by a microbiologist or consultant in communicable disease control.[1] ***C.difficile:*** See *C.difficile* recommendations.
General advice and treatment choices	Fluid replacement is essential. If systemically unwell and campylobacter suspected consider **Clarithromycin** 250-500mg bd for 5-7days if treated early (within 3 days).[2C]
Evidence	There are no routine methods for detecting enterotoxigenic *E. coli*, the commonest cause of traveller's diarrhoea.[1] Quinolones are not recommended because there is increasing resistance in *Campylobacter* to quinolones.[2]
References	1. PHE 2015 Infectious diarrhoea Quick reference guide for primary care **https://www.gov.uk/government/publications/infectious-diarrhoea-microbiological-examination-of-faeces** 2. Management of Infection Guidance for Primary Care, PHE & BIA, September 2017 **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** 3. NICE CKS – Diarrhoea – adults **http://cks.nice.org.uk/diarrhoea-adults-assessment** (accessed Jan 2017) (accessed Jan 2017) 4. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/215135/dh_133016.pdf**

Gastro-intestinal Infections – Diverticulitis

When to treat[1]	Evidence on the use of antibiotics for the treatment of uncomplicated diverticulitis is sparse, of low quality and conflicting. Generally, there is little evidence mandating the use of antibiotics in uncomplicated diverticulitis, although several guidelines recommend this. However antibiotics are still recommended, along with paracetamol and clear fluids, for managing people with mild, uncomplicated diverticulitis at home. Arrange admission for people with diverticulitis when: • pain cannot be managed with paracetamol; • hydration cannot be easily maintained with oral fluids; • oral antibiotics cannot be tolerated; • the person is frail or has a significant comorbidity that is likely to complicate their recovery (particularly if immunocompromised); • the person has any of the following suspected complications: rectal bleeding that may require transfusion, perforation and peritonitis, intra-abdominal abscess, fistula.	
When to investigate[1]	If symptoms persist after 48 hours despite conservative management at home admit patient to hospital.	
General advice[1]	Review within 48 hours or sooner if symptoms deteriorate. Arrange admission if symptoms persist or deteriorate. Prescribe paracetamol for pain. Recommend clear liquids only. Gradually re-introduce solid food as symptoms improve over 2-3 days.	
Treatment choices[1]	**First choice:** **Co-amoxiclav*** 625mg tablets ***TDS*** for at least 7 days (7-10 days)	**Second choice or if allergic to co-amoxiclav:** **Metronidazole** 400mg ***TDS*** for 7 days ***PLUS*** **Ciprofloxacin*** 500mg ***BD*** for at least 7 days (7-10 days)
Cautions	*High-risk for *C. difficile infection*.	
Evidence	Avoid non-steroidal anti-inflammatory drugs (NSAIDs) and opioid analgesics such as co-codamol, which have been identified as risk factors for diverticular perforation.[1] Evidence[3] on antibiotic treatment for uncomplicated diverticulitis suggests that antibiotics have no effects on complications, emergency surgery and recurrence. However, this evidence will need some more confirmation from future ongoing trials before clinical guidelines can be changed safely.	
References	1. **Diverticular disease March 2013 - NICE CKS** Scenario 3 accessed August 2017 2. Shabanzadeh DM, Wille-Jørgensen P.Antibiotics for uncomplicated diverticulitis. Cochrane Database of Systematic Reviews 2012, Issue 11 Date accessed 06/12/2016 Antibiotics for uncomplicated diverticulitis | Cochrane	

Gastro-intestinal Infections – *Clostridium difficile* Infection

When to treat[1]	*C. difficile* infection (CDI) ranges from asymptomatic carriage to severe life-threatening illness and management is based on clinical presentation and symptoms. Patients shown to carry a toxigenic CDI strain through Nucleic Acid Amplification Test (NAAT) regardless of toxin enzyme immunoassay (EIA) result should be managed according to clinical symptoms and suspicion of CDI. • Asymptomatic carriage does not require treatment • People with mild disease may improve with cessation of precipitating antibiotics alone[1]; treat patients with moderate CDI • If the patient has features of severe or life-threatening CDI, or their condition is rapidly deteriorating, admit to hospital • **Mild CDI:** Typically associated with <3 episodes of loose stools/day,[1B+] no or mild abdominal discomfort, no increased white cell count (WCC) • **Moderate CDI:** Typically associated with 3–5 loose stools per day,[1C] moderate abdominal discomfort / cramping, increased WCC but <15 x 10^9/L • **Severe CDI:** The number of stools may be a less reliable indicator of severity,[1C] severe abdominal discomfort / cramping / distension, WCC >15 x 10^9/L, or an acutely rising serum creatinine (>50% above baseline), or a temperature >38.5°C, or evidence of severe colitis **Life-threatening CDI:** Signs and symptoms include hypotension, partial or complete ileus, or toxic megacolon.[1B+]
When to investigate[1]	Consider CDI in patients with liquid/loose stool with recent exposure to antibiotics, Proton Pump Inhibitors (PPI) or recent hospitalisation[2,3]. Other risk factors include advanced age, history of previous CDI, exposure to other cases, underlying morbidity (abdominal surgery, cancer, chronic renal disease, tube feeding), inflammatory bowel disease.[2,3] • Specifically request CDI test for patients <65years of age (stool samples in patients >65 years of age are routinely tested for CDI) • Do not re-test people with a positive CDI if they are still symptomatic within a period of 28 days • Do not repeat tests to confirm clearance in asymptomatic patients Only re-test to confirm recurrent CDI if symptoms resolve and then recur and differential diagnosis is unclear.[2]
How to respond to a positive lab result	CDI testing uses a screening test to detect the presence of *C. difficile* bacteria and a Toxin EIA to detect the excretion of toxin causing disease.[4] • Screening test negative (Negative Predictive Value = 98.9%) CDI very unlikely to be present[4] • Screening test positive **BUT** Toxin EIA negative – potential for carriage OR active CDI, manage according to clinical symptoms and suspicion of CDI, consider alternative cause of diarrhoea or possibility of false negative Toxin EIA[4] • Screening test positive **AND** Toxin EIA positive (Positive Predictive Value = 91.4%) – CDI highly likely and associated with poor outcome.[3] • Start treatment based on results **AND** clinical assessment of severity, check full blood count and serum creatinine • Discontinue precipitating antibiotic(s) wherever possible; agents with less risk of inducing CDI can be substituted if underlying infection still requires treatment • Manage fluid loss and symptoms as for acute gastroenteritis[5], discontinue other drugs that might cause diarrhoea[1B+] • Screening test positive, Toxin EIA negative, PCR positive, patient likely to be a cross-infection risk and continue enteric precautions if on-going diarrhoea. Stop unnecessary PPI's (using a tapering regime with concomitant alginate cover for patients who have been receiving PPI's for more than eight weeks) or step down to lower risk H_2 Receptor Antagonist (H2RA)[5B]
General advice and Cautions	• Review the person daily and monitor for signs of increasing severity of disease as they may deteriorate rapidly[4] • Give advice on hand hygiene with soap and water to minimize the spread of possible infection, avoid alcohol hand rubs[2] • All antibiotics increase CDI risk (OR 3.55) but Clindamycin (OR 16.80), Cephalosporins (OR 5.68), Co-Amoxiclav (OR 2.71) and Quinolones (OR 5.50) are particularly associated with increased risk of CDI[8] • Antimotility agents (such as loperamide) should be avoided in acute infection due to the risk of precipitating toxic megacolon[1] • If possible, avoid other drugs with anti-peristaltic effects (such as opioids)[2] Administration of currently available probiotics is not recommended to prevent CDI or antibiotic associated diarrhoea[1]

continued overleaf

Gastro-intestinal Infections – *Clostridium difficile* Infection *(continued)*

Treatment choices	Patients with no history of CDI or an episode of CDI more than 30 days ago (excluding severe CDI):[1,2,10] **Metronidazole** 400-500mg *TDS* for 10-14 days[A]	Patients with a previous episode of CDI within 30 days that was treated with metronidazole (or initial severe CDI/Type 027)): **Oral Vancomycin** 125mg QDS for 10-14 days[10] then taper.	Patients with a previous episode of CDI within 30 days that was treated with vancomycin: **Oral Vancomycin** 125-500*mg QDS for 10-14 days *Higher doses can be used where there is no response to 125mg therapy to increase intraluminal concentration[10] Tapering followed by pulsed doses of Vancomycin may be of value: Week 1: 125mg QDS, Week 2: 125mg TDS, Week 3: 125mg BD, Week 4: 125mg OD, Week 5: 125mg alternate days, Week 6: 125mg every third day[1,10] Recurrent or second line: **Fidaxomicin*** 200mg BD for 10-14 days[1,6] *best to follow the advice of a consultant medical microbiologist following recurrent relapse[10]	**Faecal Microbiota Transplantation**[7] (FMT): For patients with recurrent CDI that have failed to respond to antibiotics. Consult your Clinical Commissioning Group for commissioning / referral guidelines[10]
Evidence	• 70% of patients respond to Metronidazole in 5 days; 92% in 14 days[9] • Recurrent disease occurs in about 20% of patients treated initially with either Metronidazole or Vancomycin and in 45-60% patients following a second episode of CDI.[1] Relapses tend to occur in the first two weeks after treatment cessation.[1] • Vancomycin is non-inferior to Fidaxomicin for initial cure but Fidaxomicin is superior in reducing relapse[6] • FMT has a primary cure rate of 81.3% with an overall cure rate of 93.8% when an additional treatment is given to initial non-responders (compared with vancomycin therapy alone of 30.8%). Recurrence rates of CDI post FMT are 6.3% (vancomycin 53.8%).[7]			
References	1. PHE Updated guidance on the management and treatment of *Clostridium difficile* infection. May 2013 **https://www.gov.uk/government/publications/clostridium-difficile-infection-guidance-on-management-and-treatment** 2. NICE [CKS]. Diarrhoea – antibiotic associated. July 2013. **http://cks.nice.org.uk/diarrhoea-antibiotic-associated** 3. PHE Managing suspected infectious diarrhoea: primary care. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Primary care guidance: diagnosing and managing infections - GOV.UK 4. DH. Updated guidance on the diagnosis and reporting of Clostridium difficile. March 2012. **https://www.gov.uk/government/publications/updated-guidance-on-the-diagnosis-and-reporting-of-clostridium-difficile** 5. NICE [CG184]. Gastro-oesophageal reflux disease and dyspepsia in adults: investigation and management November 2014 **https://www.nice.org.uk/guidance/cg184** 6. NICE [ESNM1]. Clostridium difficile infection: fidaxomicin. July 2012. **http://www.nice.org.uk/advice/esnm1** 7. NICE [IPG485]. Faecal microbiota transplant for recurrent Clostridium difficile infection. March 2014 **https://www.nice.org.uk/guidance/ipg485** 8. NICE [ESMPB1] Clostridium difficile infection: risk with broad-spectrum antibiotics. March 2015. 9. Belmares et al. Outcome of metronidazole therapy for Clostridium difficile disease. J. Infection December 2007. **http://www.ncbi.nlm.nih.gov/pubmed/17983659** 10. Wessex Community CDI Pathway Oct 17 **https://tinyurl.com/yc9k4c7f**			

Gastro-intestinal Infections – Travellers' Diarrhoea (Stand-by or Prophylactic Treatment)

When to treat	Travellers' diarrhoea is, for most people, a non-serious, self-limiting illness, lasting 3-4 days which will recover without antibiotic treatment.[1] Do not routinely offer prophylactic or standby antibiotics for prevention of travellers' diarrhoea.[1] **Prophylactic antibiotics:** Consider if the patient is at high risk of diarrhoea and: is immunocompromised; at high risk of complications (e.g. Crohn's disease, UC, colostomy, renal disease, congestive heart failure) or if diarrhoea could severely impact the purpose of a critical trip.[1] **Standby antibiotics:** Only consider for high risk remote areas or for people at high risk of severe illness with travellers' diarrhoea (unless eligible for prophylaxis).[1] High-risk countries are defined as most of Asia, the Middle-East, Africa, Mexico, Central and Southern America.[2]	
When to investigate	Advise travellers to seek medical care if symptoms do not improve within two days (earlier if elderly) or they have a fever or are passing blood/mucous. Seek immediate attention for children with diarrhoea if dehydration; vomiting; fever or blood.[3]	
General advice	Provide advice on food hygiene and safe drinking water if the person is travelling to locations with low standards of hygiene and sanitation.[1]	
Treatment choices[1,2,3]	**First line:** Advise the use of **oral rehydration salt solution** for the management and prevention of dehydration (particularly for children and infants).[1] **Loperamide** can be considered for travellers in whom frequent diarrhoea is inconvenient.[3] Avoid loperamide in children and patients with inflammatory bowel disease, a fever or blood in stool.[3]	**Prophylaxis:** **Ciprofloxacin** 500mg *od* (on private Rx) for up to 3 weeks. If contra-indicated seek specialist advice[1] **Standby:** (start if symptoms moderate/severe): **Ciprofloxacin** 500mg *bd* for 3 days (on private Rx)[2] ***OR*** If ciprofloxacin contra-indicated or travelling to Thailand/Far East: **Azithromycin** 500mg *od* for 3 days (on private Rx)[1] If quinolone resistance high (e.g. south Asia): consider **bismuth subsalicylate (Pepto Bismol®)** 2 tablets QDS as prophylaxis[2B+] or for 2 days treatment
Evidence	Azithromycin, bismuth salicylate, loperamide and probiotics are not recommended for prophylaxis.[1] Antibiotic treatment is associated with shorter duration of diarrhoea but higher incidence of side-effects.[4] The combination of loperamide and an antibiotic in moderate diarrhoea may lead to more rapid improvement compared with either agent alone.[3]	
References	1. NICE CKS – Diarrhoea – prevention & advice for travellers May 2013 **http://cks.nice.org.uk/diarrhoea-prevention-and-advice-for-travellers** (accessed August 2017) 2. Management of Infection Guidance for Primary Care for consultation and local adaptation September 2017. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** 3. National Travel health Network and Centre (nathnac.net) **https://travelhealthpro.org.uk/factsheet/53/travellers-diarrhoea** (accessed August 2017) 4. **Antibiotic treatment for travellers' diarrhoea - Cochrane Database of Systematic Reviews - de Bruyn - Wiley Online Library** 2012 Accessed September 2017	

Gastro-intestinal Infections – Threadworms		
When to treat[1]	Treat if threadworms have been seen or their eggs have been detected. All members of the household should be treated at the same time even if asymptomatic (unless treatment is contraindicated).	
When to investigate[1]	If the diagnosis is uncertain, the adhesive tape test for eggs may be useful – the tape should be examined under a microscope. If there are frequent recurrences consider seeking advice from a paediatrician or consultant in infectious diseases.	
General advice[2]	In conjunction with treatment, advise hygiene measures for 2 weeks (hand hygiene, pants at night, morning shower including perianal area) **PLUS** wash sleepwear, bed linen, dust, and vacuum on day one. Child <6 months add perianal wet wiping or washes three hourly.[2D]	
Treatment choices	**First line for adults and children aged >6 months:**[2] **Mebendazole** 100mg stat chewable tablet (off label if <2yrs) Repeat in 2 weeks if infestation persists[2]	**For children aged <6 months**:[1] 6 weeks strict hygiene (alone) to prevent faecal-oral re-infection[2]
Cautions[1]	Treatment with an anthelmintic is contraindicated in pregnancy. Mebendazole should not be used in the first trimester of pregnancy. However, it can be considered for off-label use in the second or third trimester. In breastfeeding, physical removal of eggs combined with hygiene methods is generally preferred. Mebendazole can be considered if drug treatment is required. This indication is off-label.	
Evidence[1,3]	Mebendazole does not kill the eggs; therefore adequate personal and environmental hygiene is essential to prevent re-infestation from recently swallowed eggs, or eggs already in the environment. It is generally accepted that mebendazole has a 90-100% cure-rate[3], however it has few contraindications and post-marketing surveillance has revealed no serious safety concerns.[1] Hygiene measures, plus physical removal advice is based on expert opinion.[1]	
References	1. CKS Threadworm Dec 2011 **https://cks.nice.org.uk/threadworm%20-%20!scenario** (accessed September 2017) 2. Management of Infection Guidance for Primary Care. Date accessed September 2017) **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/622637/Managing_common_infections.pdf** 3. NHS Choices Threadworms. Available at **Threadworms - Treatment - NHS Choices**	

Gastro-intestinal Infections – Cholecystitis	
When to treat	Reassure people with asymptomatic gallbladder stones found in a normal gallbladder and normal biliary tree that they do not need treatment unless they develop symptoms.[1] Offer laparoscopic cholecystectomy to people diagnosed with symptomatic gallbladder stones.[1]
When to investigate[2]	Urgently admit to hospital anyone with suspected acute cholecystitis for: • Confirmation of the diagnosis (including abdominal ultrasound, and blood tests such as a white blood cell count, C-reactive protein, and serum amylase). • Monitoring (for example blood pressure, pulse, and urinary output). • Treatment (may include intravenous fluids, antibiotics, and analgesia). • Surgical assessment for cholecystectomy
General advice	The Royal College of Surgeons' *Commissioning guidance:* gallstone disease states that if acute cholecystitis is suspected the person should be referred to hospital as an emergency.[2] Urgent admission to secondary care is recommended because of the high mortality rate (up to 10% associated with acute cholangitis).[3] Confirmation of the diagnosis includes abdominal ultrasound, and blood tests such as a white blood cell count, C-reactive protein, and serum amylase. There is no single test to diagnose or exclude acute cholecystitis, but diagnosis takes into account history, examination findings, and test results.[2]
References	1. Gallstone disease; diagnosis and management, October 2014 **https://www.nice.org.uk/guidance/cg188** accessed August 2017 2. Cholecystitis Clinical knowledge summaries **Cholecystitis - acute - NICE CKS** (accessed August 2017) 3. Kimura, Y., Takada, T. and Strasberg, S.M. et al (2013) TG13 current terminology, etiology, and epidemiology of acute cholangitis and cholecystitis. *Journal of Hepato-Biliary-Pancreatic Sciences.* 20(1), 8-23. **[Abstract]**

Skin & Soft Tissue
Infections

Skin & Soft Tissue Infections – Impetigo (Adults)
(FOR PAEDIATRIC GUIDELINES see page 91)

When to treat[1,2]	Although usually self-limiting, treatment is recommended for all cases, as untreated impetigo is highly contagious and there is a risk it may become generalised. Topical antibiotics should be reserved for very localised lesions and oral antibiotics used for extensive, severe or bullous impetigo. Non-bullous impetigo (also known as impetigo contagiosa or crusted impetigo) is the most common form. Lesions begin as vesicles or pustules, which rapidly burst and evolve into gold-crusted plaques. The area around the mouth and nose is most commonly affected. Bullous impetigo, presents with flaccid, fluid-filled vesicles and blisters. These easily burst leaving raw skin, and eventually form thin, flat, brown-to-golden crusts. Tends to involve the axillae and neck folds, Lesions are usually painful, are often multiple and spread rapidly.			
When to investigate	Skin swabs are not necessary to diagnose impetigo. Take a swab (for bacterial identification and sensitivity) if the infection is: very extensive or severe; recurrent (consider nasal swab for staphylococcal carriage); suspected as being a community outbreak; suspected as being caused by MRSA. Advise the person to attend a follow-up appointment if there is no significant improvement after 7 days.			
How to respond to a positive lab result	Review any culture results and ensure that an appropriate antibiotic is being used.			
General advice[1]	Advise that hygiene measures are important to aid healing and stop the infection spreading to other sites on the body and to other people.			
Treatment choices	**Small localised infections (topical antibiotics):**		**More generalized/widespread infections (oral antibiotics):**	
	Fusidic Acid 2% topically *tds* for 5 days	**If MRSA isolated:** **Mupirocin** 2% ointment topically *tds* to affected area(s) for 5 days	**Flucloxacillin** 500mg *qds* for 7 days*	**If penicillin allergic:** **Clarithromycin** 250-500mg *bd* for 7 days*
Evidence	Topical antibiotics are reserved for treatment of very localised lesions because fusidic acid is an antibiotic that is also used systemically and there are concerns that widespread use will lead to increased resistance If a topical antibiotic is used, a short course (such as 5 days) reduces exposure and the risk of resistance. * Flucloxacillin & Clarithromycin will not cover for MRSA so either go by sensitivities or discuss with a specialist.			
References	1. CKS (NICE) – Impetigo: **Impetigo - NICE CKS** Last reviewed July 2015 (Accessed June 2017) 2. Management of Infection Guidance for Primary Care; revised May 17. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Accessed September 2017 3. BNF 72 (Accessed March 2017)			

Skin & Soft Tissue Infections – Scabies

When to treat	The main symptom is generalised itch – especially at night. Characteristic silvery lines may be seen in the skin where mites have burrowed. Erythematous papular or vesicular lesions are often associated with the burrows.[1] Typical sites include the interdigital folds, wrists, elbows and around the nipples in women.[2] Simultaneously (within 24 hours) treat the infected person and all members of the household, close contacts and sexual contacts even in the absence of symptoms.[1] Pregnant and Breastfeeding women should also be treated with insecticide.[1] Scabies persists indefinitely if not treated.[1] Treat scabies that has become infected with an antibiotic.[1] Scabies is rare in children under 2 months of age. Seek specialist advice (e.g. from a paediatric dermatologist) if treatment is required for this age group.[1]	
When to investigate	Finding the mite or its products confirms, but is not necessary for making a diagnosis of scabies.[1] Review if symptoms have not cleared within 6 weeks after the first application of treatment.[1] Refer institutionalised outbreaks of scabies (e.g. schools, long-stay nursing homes) to the PHE.[1]	
Treatment choices	**Permethrin**[A+] 5% cream. Apply as described below, in two applications, 7 days apart.[3] Wash off after 8-12 hours.[1]	**If allergy: Malathion**[C] 0.5% aqueous liquid. Apply as described below, in two applications, 7 days apart.[3] Wash off after 24 hours.[1]
	Apply the treatment to the whole body including the scalp, neck, face and ears paying special attention to the areas between the fingers and toes and under the nails. If treatment is washed off during the treatment period (e.g. hand washing), it should be reapplied.[1]	
General advice	Itch may persist for several weeks.[1] Consider symptomatic treatment for itching (e.g. crotamiton 10% cream).[1] Machine wash (at 50°C or above) clothes, towels, and bed linen, on the day of application of the first treatment.[1] If recurrence occurs where all contacts were treated simultaneously and treatment was applied correctly, give a course of a different insecticide.[1]	
Evidence	There is more evidence for the effectiveness of permethrin than malathion.[1] Benzyl benzoate is regarded as too irritant, and crotamiton is ineffective compared to the recommended options.[2] Crusted scabies usually only occurs in people who are immunocompromised or who have other risk factors and does not present in the same way as classic scabies.[1] There are hyperkeratotic, warty crusts, which are usually on the hands and feet but all areas of the skin may be involved.[1] Seek specialist advice from a consultant dermatologist for the management of anyone presenting with crusted scabies; admission may be required.[1]	
References	1. Clinical knowledge summaries – Scabies Revised May 2016 (Accessed April 2017) **Scabies - NICE CKS** 2. British Association of Sexual Health and HIV 2016 United Kingdom National Guideline on the Management of Scabies. **http://www.bashh.org/guidelines** 3. Management of Infection Guidance for Primary Care, PHE September 2017. **Primary care guidance: diagnosing and managing infections - GOV.UK** (Accessed September 17)	

Skin & Soft Tissue Infections – Eczema	
When to treat	If **no visible signs of infection**, use of antibiotics (alone or with steroids) encourages resistance and does not improve healing. In eczema with **visible signs of infection**, use treatment as in impetigo. Admit to hospital urgently if eczema herpeticum (disseminated herpes simplex virus infection) suspected. Signs of eczema herpeticum are: • rapidly worsening, painful eczema; • clustered blisters • punched-out erosions which may coalesce to form larger areas of erosion that can extend over the entire body; • possible fever, lethargy, or distress. Refer urgently (within 2 weeks) to a dermatologist if infected eczema has not responded to treatment. Refer to a dermatologist if recurrent secondary bacterial infection.
General advice[2]	Flares can usually be controlled with emollient and/or topical steroid treatment. If persistent, severe itch or urticaria: consider a one-month trial of non-sedating antihistamines. If severe, extensive eczema: consider a short course of oral corticosteroids (with oral antibiotics if signs of infection).
Evidence[1]	Oral antibiotics were not associated with benefit in small trials of eczema without visible signs of infection.
References	1. Public Health England. Management of infection guidance for primary care for consultation and local adaptation. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/591916/managing_common_infections.pdf** Accessed September 2017 2. Clinical Knowledge Summaries: **https://cks.nice.org.uk/eczema-atopic** Revised March 2017. Accessed September 2017

Skin & Soft Tissue Infections – Acne vulgaris

When to treat[1]	**Mild acne:** Predominantly consists of non-inflammatory comedones (open and closed) **Moderate acne:** Consists of a mixture of non-inflammatory comedones and predominating inflammatory papules and pustules. **Severe acne:** Characterized by presence of widespread nodules and cysts together with preponderance of papules and pustules. Complications include scarring, (although rare in mild acne), psychological problems and hyperpigmentation. Treatment should be started early to avoid scarring.	
When to investigate[1]	• Refer to psychiatry people who have severe psychosocial problems, including a morbid fear of deformity • Refer to dermatology: 1) Severe acne: urgently people with severe variant with systemic symptoms (i.e. acne fulminans), refer (soon) all other people 2) Moderate acne: features that make the diagnosis uncertain; those at risk of developing scarring despite treatment; acne that has failed to respond adequately to treatment (over a period of at least 6 months). • Refer to endocrinology or gynaecology, women suspected of having an underlying endocrinological cause of acne.	
General advice[1]	Advise not to wash more than twice a day, use a mild soap or cleanser and lukewarm water, not to use vigorous scrubbing when washing acne-affected skin and not to attempt to 'clean' blackheads. Treatments are effective but take time to work (typically 8-12 weeks) and may irritate the skin, especially at the start of treatment.	
Treatment choices[1,2]	**Topical Treatment** ***Mild/moderate:*** **First line: Topical Retinoid *OR* Benzoyl Peroxide** **Second line: Azelaic Acid** ***Moderate acne (at risk of scarring):*** **Topical antibiotic *PLUS* Benzoyl Peroxide *OR* Topical Retinoid**	***Moderate (if extensive/significant risk of scarring)/severe (awaiting referral):*** **First line: (Oxy)tetracycline** 500mg *bd* **Second line: Lymecycline** 408mg *od* ***OR*** **Doxycycline** 100mg *od* **Alternative regimen: Erythromycin** 500mg *bd* ***PLUS*** **Topical Retinoid *OR* Benzoyl Peroxide**
	Treatment notes: ***Oral antibiotics:*** follow up at 6-8 weeks: i) Good response- continue for additional 4-6 months (consider halving dose for latter half of treatment period) then stop; ii) Inadequate response – Continue for a minimum of 3 months before assuming treatment ineffective (consider referral at this stage). Continue topical treatment after stopping oral antibiotic; also consider combination of topical retinoid plus benzoyl peroxide (though may be poorly tolerated). Do not use oral antibiotic treatment alone. Do not combine topical and oral antibiotic treatments. Topical antibiotics should be limited to 12 weeks treatment where possible. Topical retinoids are contraindicated in pregnancy.	
	Consider prescribing a standard combined oral contraceptive or co-cyprindiol (Dianette) for women who require contraception.	
Evidence[1,2]	Topical antibiotics are no more effective than benzoyl peroxide and heavy reliance on them, particularly with erythromycin, has caused significant emergence of resistant strains of bacteria. Minocycline is not recommended as first-line treatment as other tetracyclines are regarded as being as effective, less expensive and with better safety profiles.	
References	1. Clinical Knowledge Summaries: **https://cks.nice.org.uk/acne-vulgaris** Revised Sep 2017. Accessed March 2017 2. Public Health England. Management of infection guidance for primary care for consultation and local adaptation. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/591916/managing_common_infections.pdf** Revised Sept 2017. Accessed December 2017 3. The BMJ: What role for topical antibacterials in acne? Drug and Therapeutics Bulletin 2010 ; 48 : 141-144	

Skin & Soft Tissue Infections – Acne Rosacea

When to treat[1]	Initial management in primary care includes lifestyle advice (such as avoidance of triggers), medication review (some drugs can aggravate acne rosacea) and assessing the impact of the condition on the person's quality of life including management of any psychosocial complications that may be present.[1]
When to refer[1]	Refer to a dermatologist if there is persistent flushing and telangiectasia that does not respond to lifestyle changes.[1] Refer prominent rhinophyma to a plastic surgeon.[1] People with symptoms of keratitis (eye pain, blurred vision, sensitivity to light) should be referred urgently to an ophthalmologist.[1] Refer to an ophthalmologist if ocular symptoms are resistant to optimal treatment.[1]
General advice[1]	Advise daily and frequent application of high-factor sunscreen (minimum sun-protection factor 30) to the affected skin and use of a hypoallergenic moisturiser for dry skin.[1] If flushing is problematic, advise the avoidance of trigger factors (where practical) such as extremes of temperature, sunlight, strenuous exercise, stress, spicy foods, caffeine, cheese, alcohol and hot drinks.[1] British Association of Dermatologists (BAD) Patient Information Leaflet (PIL) for **Acne rosacea**.
Treatment choices	**Mild/moderate papulopustular acne rosacea – azelaic acid** 15% gel *BD* ***OR*** **metronidazole** 0.75% gel *BD* for 6-9 weeks[1,2] **Ivermectin 1%** cream OD[3] (specialist recommendation only) for up to 4 months (review and discontinue if no response at 12 weeks) is an alternative consideration[2,3] **Extensive papules, pustules, or plaques – oxytetracycline 500 mg *BD*** for a trial course of 6-12 weeks[1] (doxycycline 100mg *OD* is an off label alternative in impaired renal function, erythromycin 500mg *BD* is an off label alternative for pregnant or breastfeeding women or when tetracyclines are contraindicated.[1]) **Predominant erythema – brimonidine 0.5% gel *OD***[1,4] (consider only if lifestyle changes are ineffective, telangiectasia may be accentuated as general redness is reduced). Treatment should be initiated at a low dose for at least a week and gradually increased to the maximum recommended dose of 1g/day[5] **Ocular rosacea**, consider eyelid hygiene measures, artificial tears or ocular lubricants (for dry eye symptoms) and If symptoms are moderate to severe oral antibiotics as above[1]
Evidence[2]	There was high quality evidence to support the effectiveness of topical azelaic acid, topical ivermectin, topical brimonidine, and oral doxycycline for rosacea. Moderate quality evidence was available for topical metronidazole and oral tetracycline.
References	1. NICE CKS Rosacea –acne January 2016 **Rosacea - acne - NICE CKS** 2. Van Zuuren, E., Fedorowicz, Z., Carter, B., et al. (2015) Interventions for rosacea (Cochrane intervention review). Iss.4 **Interventions for rosacea - van Zuuren - 2015 - The Cochrane Library - Wiley Online Library** 3. NICE guidance Inflammatory lesions of papulopustular roasacea:ivermectin 10mg/g cream Jan 2016 **https://www.nice.org.uk/advice/esnm68/chapter/Full-evidence-summary** 4. NICE guidance Facial erythema of rosacea:brimonidine tartrate gel July 2014 **https://www.nice.org.uk/advice/esnm43/chapter/Full-evidence-summary** 5. **Mirvaso 3mg/g Gel - Summary of Product Characteristics (SPC) - (eMC)**

Skin & Soft Tissue Infections – Cellulitis (Adults)
(FOR PAEDIATRIC GUIDELINES see page 91)

When to treat[1,2]	Cellulitis presents with an acute onset of red, painful, hot, swollen, and tender skin, with possible blister or bullae formation. The leg is the most commonly affected site, presentation is usually unilateral. Often (but not always) associated with a break in the skin (portal entry). If patient afebrile and healthy other than cellulitis, can be managed in primary care.[2]
When to investigate[1,2]	**If patient febrile and ill, admit for IV treatment** Consider admission for patients with severe or rapidly deteriorating cellulitis; an uncertain diagnosis with sinister signs or symptoms (e.g. possible necrotizing fasciitis); severe systemic illness; comorbidities that may complicate or delay healing; facial* or periorbital cellulitis; lymphoedema; or for the very young, elderly or frail people. *Mild facial cellulitis can be managed in primary care (see treatment below) **If river or sea water exposure, discuss with microbiologist** Consider taking a swab for culture and sensitivity testing if there is a visible portal of entry for bacteria (e.g. an open wound); other investigations are not usually necessary.
How to respond to a positive lab result	Alter treatment in response to culture and sensitivity results of potential pathogens. Refer people who fail to respond to oral antibiotics or have frequent recurrence of cellulitis, for example more than two episodes at the same site.[1]
General advice	Before treatment, draw around the extent of the infection with a permanent marker pen for future comparison.[1] Advise patient to have an adequate fluid intake.[1] Elevation of the affected area speeds improvement by promoting gravity drainage of the oedema/inflammatory substances.[3] In patients with lymphoedema antibiotic prophylaxis should be offered to patients who have two or more attacks of cellulitis per year.[3]
Treatment choices	**First Line:** **Flucloxacillin** 500mg - 1g *qds* for 7 days[5C] ***If penicillin allergic:*** **Clarithromycin**[2] 500mg *bd* for 7 days ***If penicillin allergic and taking statins***: **Doxycycline**[2] 200mg stat then 100mg *od* for 7 days **Mild facial cellulitis:** **Co-amoxiclav*** 625mg *tds* for 7 days[2]
	If slow response continue antibiotics for a **further 7 days**.[2]
	If known MRSA carrier, or swab positive for MRSA, contact the local microbiologist (or member of the infection-control team) for advice regarding treatment (such as antibiotics and wound care). Do not routinely treat with oral or topical antibiotics, unless directed by microbiology.
Cautions	* High risk for *C Difficile* infection. Stop clindamycin if diarrhoea occurs. Flucloxacillin, clarithromycin and co-amoxiclav will not cover for MRSA so either treat according to sensitivities or discuss with a specialist.
Evidence	Expert consensus that people with no signs of systemic toxicity and no uncontrolled co-morbidities can usually be managed with oral antibiotics.
References	1. CKS: **https://cks.nice.org.uk/cellulitis-acute** Revised July 2015. Accessed March 2017 2. Public Health England. Management of infection guidance for primary care for consultation and local adaptation. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/591916/managing_common_infections.pdf** Accessed January 2018 3. British Lymphology Society. Consensus document on the management of cellulitis in lymphoedema 2016 **http://www.lymphoedema.org/images/pdf/CellulitisConsensus.pdf** 4. Clindamycin versus trimethoprim-sulfamethoxazole for uncomplicated skin infections Miller, Daum et al. **https://www.ncbi.nlm.nih.gov/pubmed/25785967** 5. A clinical trial comparing flucloxacillin with or without clindamycin for the treatment of limb cellulitis. Brindle et al **https://www.ncbi.nlm.nih.gov/pubmed/28314743**

Skin & Soft Tissue Infections – Leg Ulcers

When to treat	Signs of an infected leg ulcer include enlarging ulcer with abnormal, bleeding or bridging granulation tissue, increased exudate, increased disproportionate pain, pyrexia, systemic inflammatory response syndrome, sepsis, foul odour or cellulitis, lymphangitis and lymphadenopathy.[1,2] Leg ulcers are **always** colonised and antibiotics will only promote healing during active infection.[1,2,3] If the patient has an active infection, start empirical antibiotics after taking a wound swab for cultures and sensitivity.[2]	
When to investigate	Ulcers should not be routinely swabbed unless there is clinical evidence of infection. Treat the patient, NOT culture results.[2,4] Take a swab from all infected leg ulcers before prescribing an antibiotic.[1,2] Use a swab with transport medium, to aid survival of fastidious organisms. Clean the ulcer with a sterile solution to remove debris, pus or other foreign material first, and gently pass the swab over the area in a zig zag motion ensuring it is turned in a circular motion so that the entire swab is covered. Swab from the centre to the outside of the wound ensuring any exudate is thoroughly absorbed onto the swab. Ensure that a full history is given when sending the swab to the pathology department.[1]	
How to respond to a positive lab result	Swab results determine organisms present and antimicrobial susceptibilities, they do not determine the presence of infection.[4] Inclusion of antibiotic susceptibilities in a microbiology report does not necessarily mean an organism is significant or that it requires antibiotic treatment. Group A ß-haemolytic streptococci can be associated with significant infection and delay healing.[2] Significance of other organisms depends on presence of the clinical criteria above. Review antibiotics after culture results.[2] Seek local microbiology advice if colonised with MRSA.[2] The use of topical antibiotics in the management of infected wounds should be avoided in order to minimise the risk of allergy and the emergence of bacterial resistance.[1,2,5]	
General advice	Advise patients to keep mobile, elevate legs when immobile, avoid trauma and wear appropriate footwear, use an emollient frequently even after the ulcer has healed, examine legs regularly for deterioration and wear compression bandages or stockings as advised.[1,3]	
Treatment choices	**First line if evidence of active infection:** **Flucloxacillin** 500mg-1g (dependant on BMI) ***QDS*** for 7 days. If slow response continue for a further 7 days[2] **If cellulitis is persistent, Clindamycin*** 300-450mg ***QDS*** is an alternative. Stop clindamycin if diarrhoea develops[2] *High risk for *C Difficile* infection	**If penicillin allergic: Clarithromycin** 500mg *BD* for 7 days. If slow response continue for a further 7 days[2] **If penicillin allergic and on statin: Doxycycline** 200mg stat then 100mg **daily** for 7 days. If slow response continue for a further 7 days[2] **Non-healing:** antimicrobial reactive oxygen gel may reduce bacterial load.[6] This product is not readily available.
	Note: Flucloxacillin & Clarithromycin will not cover for MRSA. Discuss treatment/antibiotic choice with local microbiologist if MRSA.[2]	
Evidence	Available evidence suggests that no differences in complete wound healing were detected when silver-impregnated dressings, povidone iodine or honey-based preparations were compared with non-antimicrobial dressings for venous leg ulcers (Check with tissue viability specialist if deemed appropriate).[4] More research study participants were healed when given cadexomer iodine compared with standard care but cadexomer iodine dressings should only be used when there is evidence of heavy bacterial load/local wound infection and these dressings should be stopped once local infection has been controlled and for no longer than 3 months continuously.[4,5]	
References	1. C.K.S.NICE – Venous Leg Ulcer **http://cks.nice.org.uk/leg-ulcer-venous** (Accessed April 2017) 2. PHE Venous ulcers: infection diagnosis and microbiological investigation guide for primary care updated March 2016 **https://www.gov.uk/government/publications/venous-leg-ulcers-diagnosis-and- microbiology-investigation** 3. SIGN Management of Chronic Venous Leg Ulcers a national clinical guideline 120. August 2010 Available from: **http://www.sign.ac.uk/assets/sign120.pdf** 4. O'Meara S, Al-Kurdi D, Ologun Y, Ovington LG,Martyn-St JamesM, Richardson R. Antibiotics and antiseptics for venous leg ulcers. Cochrane Database of Systematic Reviews 2014, Issue 1.Art. No.: CD003557. DOI: 10.1002/14651858.CD003557.pub5. 5. Australian and New Zealand Clinical Practice Guideline for Prevention and Management of Venous Leg Ulcers 2011. **http://www.woundsaustralia.com.au/publications/2011_awma_vlu_guideline_abridged.pdf** 6. PHE Management and Treatment of common infections **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/664740/Managing_common_infections_guidance_for_consultation_and_adaptation.pdf** Accessed Jan 18	

Skin & Soft Tissue Infections – Diabetic Foot Ulcer

When to treat	• Antibiotics should not be used for foot ulcers without signs of infection as they do not enhance healing or prevent infection.[1,2,3] • The clinical diagnosis of foot infection is based on ≥ two of the following: purulent discharge from an ulcer or signs of inflammation (i.e. erythema, pain, tenderness, warmth or induration)2 Other signs may include foul odour, non-purulent secretions, friable or discoloured granulation tissue, undermining of wound edges.[2] • Ideally refer anyone with new diabetic foot infection to a multidisciplinary foot-care team within 24 hours.[2,3,4] If this is not possible and the infection is superficial and non- limb-threatening, consider taking swabs then start empirical antibiotic treatment.[3,4] • Mild infections are those where the cellulitis or erythema extends > 0.5cm but ≤ 2cm around the ulcer, and infection is limited to the skin or superficial subcutaneous tissues and there are no other local complications or systemic illness.[2,3,5] • Moderate infections (erythema > 2cm, or involving structures deeper than skin and subcutaneous tissues e.g., abscess, fasciitis; and no systemic inflammatory response signs – SIRS) should be referred for inpatient management in the presence of complications e.g. severe peripheral arterial disease.[2,3,5] • If the infection is severe (> 2 SIRS criteria), refer for urgent inpatient management.[2] Patients with any of the following should be referred for urgent inpatient management: pink or pale, painful, pulseless foot (indicating critical ischaemia); spreading cellulitis, lymphangitis; crepitus; lack of response of infection to oral antibiotics; suspicion of bone involvement or deep seated infection; immunocompromised patients or those with poor diabetic control.[2,3]	
When to investigate	Swabs should be taken from the deepest part of the cleaned wound after removal of surface contamination and exudate.[2] Ensure that the person is reviewed within 48 hours.[5]	
How to respond to a positive lab result	Patients should be reassessed 24 to 72 hours after initiating empiric antibiotic therapy to evaluate their response and modify the antibiotic regimen, if indicated by early culture results.[3,4] Clinical failure of appropriate antibiotics may be due to patient non-adherence, antibiotic resistance, superinfection, undetected abscess, osteomyelitis or severe tissue ischaemia.[1]	
General advice	Care of people with foot ulcers should include re-distribution of foot pressures, investigating vascular insufficiency, optimising glycaemic control and wound management.[1,4] Advise them to seek urgent medical attention if their symptoms or general condition become worse.[4] Elevation of the affected area speeds improvement by promoting gravity drainage of the oedema/inflammatory substances.[1]	
Treatment choices	**First Line: Flucloxacillin** 1000mg *QDS and Metronidazole 400mg TDS for 7 days* [4,5]	**If penicillin allergic OR known to be infected/colonised with MRSA within the last year: Doxycycline** 100mg ***BD***[2,3,5] and **Metronidazole** 400mg ***TDS*** for 7 days
• **Mild infection**	Consider continuing antibiotics for a further 7 days depending on speed of response to treatment.[3,5]	
• **Moderate infection** without complications	**First Line**[3,5]**: *Co-amoxiclav*** 625mg *TDS* for 14 days **If penicillin allergic**[5]**: Clindamycin*** 450mg ***QDS PLUS*** **Moxifloxacin*** 400mg ***OD*** for 14 days * High risk for *C Difficile infection*	**If known to be infected/colonised with MRSA within the last year:** seek advice from a Microbiologist as may require inpatient management
Evidence	Consider continuing antibiotics for a further 7 days depending on severity of infection and speed of response to treatment.[2,3] Continue antibiotic therapy until the infection has resolved but not necessarily until a wound has healed.[2] Several antibiotics have been shown to be effective, but no single regimen has shown superiority.[1]	
References	1. Bader M. Diabetic Foot Infection. American Family Physician 2008; 78(1): 71-79. 2. IGWDF guidance **http://www.iwgdf.org/files/2015/website_infection.pdf** 3. Infectious Diseases Society of America 2012. Clinical Practice Guideline for the Diagnosis and Treatment of Diabetic Foot Infections. Clinical Infectious Diseases 2012;54(12):132–173 4. NICE Guideline (NG19) Diabetic foot problems: prevention and management Aug 15 Updated January 2016 (accessed June 2017) 5. HHFT antimicrobial guidelines **http://microguide.horizonsp.co.uk/viewer/HHFT** 6. Leese G et al. Use of antibiotics in people with diabetic foot disease: A consensus statement on behalf of the Scottish Diabetes Group and the Scottish Infectious Diseases Society, The Diabetic Foot Journal Vol 12 No 2 2009 7. Cochrane Database of Systematic Reviews. Topical antimicrobial agents for treating foot ulcers in people with diabetes June 2017 Jo C Dumville, Benjamin A Lipsky, Christopher Hoey, Mario Cruciani, Marta Fiscon, Jun Xia	

Skin & Soft Tissue Infections – MRSA (meticillin-resistant *Staphylococcus aureus*)

When to treat

For **MRSA colonisation**, prescribe suppression regimen for patients with positive cultures awaiting elective procedures.[1,2]
MRSA infection occurs when MRSA causes harm (for example boils, wound infections, chest and urinary infections) by entering tissues, for example through a cut or wound, and requires treatment. For patients with **active MRSA infection** that has been confirmed by laboratory tests contact a local microbiologist (or member of the infection control team) for advice regarding treatment (such as antibiotics and wound care).[3,4] Do not give systemic antibiotics to patients with minor skin and soft tissue infections or small abscesses (<5 cm). Incise and drain small abscesses without cellulitis and do not give antibiotic therapy.[5] Consider admitting people who are MRSA positive if they have worsening signs of infection (e.g. sepsis, worsening cellulitis, fever, or tachycardia), particularly if they are likely to require parenteral antibiotic therapy and/or surgical drainage.[3]

When to investigate

Screening for colonisation: GPs or pre-admission clinics should screen patients awaiting elective admissions to high risk units (or as defined by local policy) and patients previously identified as colonised with or infected by MRSA.[1] Local or national exceptions may apply. Swabs should be taken from the nose and any skin lesions or wounds.[3]
Diagnosing active infection: Swab for pathogens including MRSA, or obtain a specimen if appropriate, if the person has an active infection and one or more of the following risk factors: elderly or debilitated people with critical or chronic illness; surgical wounds, open ulcers, intravenous lines, or catheter lines; infected pressure sore; history of MRSA colonisation or infection; recent surgery; recent hospital discharge; regular nursing home contact or a nursing home resident; recent antibiotic use (especially cephalosporins, fluoroquinolones, and macrolides); dialysis; permanent urinary catheter.[3]
Panton-Valentine Leukocidin (PVL) is a toxin produced by 20.8-46% of *S. aureus* from boils/abcesses.[4] PVL strains are rare in healthy people but can cause severe invasive infections.[4] Send swabs if **recurrent boils/abscesses**. At risk: recurrent skin infections, invasive infection, MSM, if there is more than one case in a home or close community (school children, military personnel, nursing home resident, household contacts).[4]

How to respond to a positive lab result

Suppression of colonisation should take place within the 5 days prior to operation.[2] For active MRSA infection contact a local microbiologist for antibiotic sensitivities to guide treatment.[3,4]

General Advice

Give patient MRSA leaflets/literature. **http://mrsaactionuk.net/pdfs/MRSA_Advice.pdf** MRSA to be recorded as an active problem in the patient's medical/GP records. Ask patient to inform future healthcare providers of their MRSA diagnosis (in case antibiotics are needed).

Treatment choices

SUPPRESSION: Treat underlying skin conditions (e.g. eczema), remove and/or replace invasive devices and treat skin breaks. Suppression therapy for PVL should only be started after the primary infection has resolved as ineffective if lesions are still leaking.[4] **Use both nasal and skin regimens.**[2]

Nasal: Mupirocin in paraffin base- apply to anterior nostrils *TDS* (8 hourly) for 5 days.[2] If resistant to mupirocin **Naseptin** nasal cream, apply to anterior nostrils QDS for 10 days (**contra-indicated:** if patient is allergic to peanut, soya or chlorhexidine)	**Skin:** 4% **Chlorhexidine gluconate** body-wash/shampoo daily for 5 days. Ensure that hair is washed twice using the same solution during the treatment period. If allergic to chlorhexidine/sensitive skin/child: **Octenidine** wash lotion (Octenisan®) - use once daily as whole body wash for 5 days, allow 3 minute contact time – (Unlicensed product, classed as cosmetic. Available on prescription).[6]

ORAL ACTIVE TREATMENT:[3,4] or MRSA confirmed by laboratory result contact local microbiologist.

References

1. DOH Implementation of modified admission MRSA screening guidance for NHS (2014) **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/345144/Implementation_of_modified_admission_MRSA_screening_guidance_for_NHS.pdf**
2. Hampshire Hospitals NHS Trust **Microbiology - Hampshire Hospitals NHS Foundation Trust**
3. NICE CKS MRSA in Primary care: **https://cks.nice.org.uk/mrsa-in-primary-care**. Revised July 2013. Accessed December 2017
4. Management of Infection. Guidance for Primary Care, PHE &BIA Updated September 2017 Accessed December 2017 **Primary care guidance: diagnosing and managing infections - GOV.UK**
5. Gould F. Kate et al 2009 .Guidelines for the prophylaxis and treatment of MRSA in the UK. Journal of Antimicrobial Chemotherapy (2009) 63 849-61. **http://bsac.org.uk/wp-content/uploads/2012/02/BSAC-Working-Party-Reports_2012_July.pdf**
6. Danilevicius M1, Juzėnienė A2, et al (2015). *MRSA decontamination using octenidine-based products.* **Br J Nurs.** Aug 13-Sep 19;24(15):S36, S38-40.

Skin & Soft Tissue Infections – Animal Bite

When to treat[1,2]	Prescribe prophylactic antibiotics if the wound is less than 48 hours old, and there is a high infection risk*. Antibiotics are not usually needed if the wound is more than 48 hours old and there is no sign of local or systemic infection. *High Infection risk: bite to the hand, foot, and face; puncture wounds; all cat bites; 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)Refer to A&E for further assessment and management if wound closure is necessary. Admit anyone who has severe infection or who is systemically unwell as IV antibiotics may be required. **Assess risk of tetanus and rabies.** If any risk of rabies contact the Virus Reference Department of the Health Protection Agency (HPA telephone 020 8327 6017).	
When to investigate[1]	Where infection suspected, send a pus or deep wound swab for culture (state on form that swab is from an infected animal bite).	
When to admit	Admit anyone who has a severe infection or who is systemically unwell as intravenous antibiotics may be required.	
How to respond to a positive lab result	Alter treatment in response to culture and sensitivity results. For bites from animals not covered in this guidance, seek microbiology advice for the most appropriate treatment.	
General advice[1]	If the wound has just occurred, remove any foreign bodies from the wound and encourage it to bleed. Clean and irrigate the wound.	
Treatment choices[2]	**Cat or Dog bite first line prophylaxis or treatment:** **Co-amoxiclav*** 375-625mg *tds* for 7 days	**Cat or Dog bite prophylaxis or treatment *if penicillin allergic:*** **Metronidazole** 400mg *tds* ***PLUS*** **Doxycycline** 100mg *bd* for 7 days
Cautions	Antiseptic cleansers are not necessary, and there is some concern that they damage tissue and delay wound healing. * High risk antibiotic for *C Difficile*. Co-Amoxiclav will not cover for MRSA.	
Evidence	Co-amoxiclav recommended first line for treatment or prophylaxis of animal bites because it is a broad-spectrum antibiotic that is effective against the most commonly isolated organisms from animal bites (including Pasteurella). Macrolides are not recommended for animal bites because they do not adequately cover Pasteurella.	
References	1. CKS – Bites – human and animal: **http://cks.nice.org.uk/bites-human-and-animal** Last reviewed July 2015 (Accessed April 2017) 2. Management of Infection Guidance for Primary Care for Consultation and Local Adaption; September 2017. **https://www.gov.uk/government/publications/managing-common-infections-guidance-for-primary-care** (Accessed September 2017)	

Skin & Soft Tissue Infections – Human Bite

When to treat[1,2]	Prescribe prophylactic antibiotics for all human bite wounds less than 72 hours old, even if there is no sign of infection. Refer to A&E for further assessment and management if wound closure is necessary. Admit anyone who has severe infection or who is systemically unwell as IV antibiotics may be required. **Assess risk of tetanus, HIV, Hepatitis B&C:** Seek immediate advice from a consultant in microbiology or infectious diseases for anyone considered to be at risk of HIV, hepatitis B or C. Consider all people to be at risk unless the current status of the biter is known (rare). Consider if tetanus prophylaxis is required.	
When to investigate[1]	Where infection suspected, send a pus or deep wound swab for culture before cleaning the wound and starting antibiotics (state on form that swab is from an infected human bite).	
How to respond to a positive lab result	Alter treatment in response to culture and sensitivity results.	
General advice[1]	If the wound has just occurred remove any foreign bodies from the wound and encourage it to bleed. Clean and irrigate the wound thoroughly with warm running water.	
Treatment choices[2]	**Prophylaxis or treatment:** **Co-amoxiclav*** 375-625mg *tds* for 7 days	***Prophylaxis or treatment if penicillin allergic:*** **Metronidazole** 400mg *tds* ***PLUS*** **Doxycycline** 100mg *bd* for 7 days ***OR*** **Metronidazole** 200-400mg *tds* ***PLUS*** **Clarithromycin** 250-500mg *bd* for 7 days
	***High risk for *C difficile* infections. Co-amoxiclav will not cover for MRSA.**	
Cautions	Antiseptic cleansers are not necessary and there is some concern that they damage tissue and delay wound healing.	
Evidence[2]	Co-amoxiclav recommended first line for treatment or prophylaxis of human bites because it is a broad-spectrum antibiotic that is effective against the most commonly isolated organisms from human bites.	
References	1. CKS – Bites – human and animal: **http://cks.nice.org.uk/bites-human-and-animal** Last reviewed July 2015 (Accessed April 2017 2. Management of Infection Guidance for Primary Care for Consultation and Local Adaption; revised September 2017 (Accessed September 2017) **https://www.gov.uk/government/pulications/managing-common-infections-guidance-for-primary-care**	

Skin & Soft Tissue Infections – Insect bites

When to treat[1,2]	Transient and large local reactions to insect bites can occur and treatment should recommend local measures (cold compress, elevation of limb), analgesia and antihistamines. Antimicrobials should only be prescribed where there is evidence that a secondary infection has occurred e.g. increasing pain, swelling, increasing redness and pus. If patient afebrile and healthy other than cellulitis, can be managed in primary care.[2]	
When to investigate[1,2]	**If patient febrile and ill, admit for IV treatment** Consider admission for patients with severe or rapidly deteriorating cellulitis; an uncertain diagnosis with sinister signs or symptoms(e.g. possible necrotizing fasciitis); severe systemic illness; comorbidities that may complicate or delay healing; facial* or periorbital cellulitis; lymphoedema; or for the very young, elderly or frail people. *Mild facial cellulitis can be managed in primary care (see cellulitis guideline) **If river or sea water exposure, discuss with microbiologist** Consider taking a swab for culture and sensitivity testing if there is a visible portal of entry for bacteria (e.g. an open wound); other investigations are not usually necessary. Consider Lyme disease if there is history of tick bite and/ or if rash suggestive of erythema chronicum migrans.	
How to respond to a positive lab result	Alter treatment in response to culture and sensitivity results of potential pathogens.	
General advice	Before treatment, draw around the extent of the infection with a permanent marker pen for future comparison.[1] Advise patient to have an adequate fluid intake.[1] Elevation of the affected area speeds improvement by promoting gravity drainage of the oedema/inflammatory substances.[3]	
Treatment choices (if evidence of secondary infection)[2]	**First Line:** **Flucloxacillin** 500mg *qds* for 7 days[C]	***If penicillin allergic:*** **Clarithromycin** 500mg *bd* for 7 days ***If penicillin allergic and taking statins:*** **Doxycycline** 200mg stat then 100mg daily for 7 days
	If slow response continue antibiotics for a **further 7 days.**	
Cautions	Flucloxacillin and clarithromycin will not cover for MRSA.	
Evidence[2]	Expert consensus that people with no signs of systemic toxicity and no uncontrolled co-morbidities can usually be managed with oral antibiotics.	
References	1. CKS (NICE) –Insect bites and stings Management in primary care October 2016 (accessed March 2017). **Insect bites and stings - NICE CKS** 2. Management of Infection Guidance for Primary Care; September 2017. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** 3. Practice Guidelines for the Diagnosis and Management of Skin and Soft-Tissue Infections:2014 Update by Infectious Diseases Society of America **Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 Update by the Infectious Diseases Society of America | Clinical Infectious Diseases | Oxford Academic**	

Skin & Soft Tissue Infections – Fungal Infection – Skin

When to treat	Treat fungal skin infections with topical or oral antifungals depending on their severity and location (see below).[1] Scalp infections: discuss with specialist especially in children (oral antifungal required).[2]		
When to investigate	Samples are not needed for uncomplicated athlete's foot, mild infections of the groin and mild skin ringworm.[2] Take samples if oral treatment is being considered; in severe or extensive skin fungal infections; for skin infections refractory to initial treatment or when the diagnosis is uncertain.[2] Scrape skin from the advancing edge of lesion. Use a blunt scalpel blade or similar. 5mm[2] of skin flakes are needed for microscopy and culture. Do not refrigerate.[2]		
How to respond to a positive lab result	Treat if positive lab cultures. Susceptibility testing of dermatophytes is not required, as antifungal resistance is unusual and there is no known correlation between antifungal susceptibilities and outcome.[2] For non-dermatophyte moulds other than Candida spp, seek the advice of a microbiologist or dermatologist.[2]		
General advice	Wash the affected skin daily and dry thoroughly afterwards, wash clothes and bed linen frequently, don't share towels and wash them frequently, wear loose-fitting clothes made of cotton.[1]		
Treatment choices	**Dermatophyte infection:** **Skin or foot:**[2] Topical 1% **Terbinafine**[A+] *od - bd* for 7-14 days[A+] **Groin or foot:**[2] Use a 1% Azole cream *od - bd* for 4-6 weeks Alternative for **foot** only:[3] **Topical Undecanoates** (Mycota®)[B+] *bd* continued for 1-2 weeks after healing	**Candida infection:** **Azole** cream 1% *od - bd* continued for 1-2 weeks after healing[1]	**If intractable, send skin scrapings before starting oral treatment:**[3] **Terbinafine** 250mg oral *od*[4] **Skin:** 4 weeks **Groin:** 2-4 weeks **Foot:** 2-6 weeks[4] ***OR* Itraconazole**[4]* **Skin or groin:** either 100mg oral daily for 15 days, or 200mg od for 7 days[4] **Foot:** either 100mg oral once daily for 30 days or 200mg twice daily for 7 days[4]
Cautions	Baseline LFTs before starting terbinafine, discontinue if symptoms of liver toxicity. *Following reports of heart failure, caution is advised when prescribing itraconazole to patients at high risk of heart failure.[4] Do not give a corticosteroid preparation alone.[1] Topical ketoconazole, itraconazole and terbinafine not licensed for use in children.		
Evidence	As terbinafine is fungicidal, one week is as effective as 4 weeks azole which is fungistatic.[4A-] A Cochrane review found little difference between terbinafine and azoles in standard courses at 2 weeks after baseline however at 6 weeks, treatment failure was lower with terbinafine.[3]		
References	1. Clinical Knowledge Summaries **http://cks.nice.org.uk/fungal-skin-infection-body-and-groin https://cks.nice.org.uk/fungal-skin-infection-foot https://cks.nice.org.uk/fungal-skin-infection-scalp** Accessed April 2017. 2. PHE Fungal skin and nail infections 2011. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/345389/Fungal_infection_quick_reference_guide.pdf** 3. Management of Infection Guidance for Primary Care, PHE & BIA. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** (accessed September 2017). 4. BNF 72 September 2016 - March 2017.		

Skin & Soft Tissue Infections – Fungal Infection – Fingernail or Toenail

When to treat	Start therapy only if infection is confirmed by laboratory.[1C] Only 50% of nail dystrophy are fungal.[2] Self-care alone may be appropriate for people who are not bothered by the infected nail or who wish to avoid the possible adverse effects of drug treatment.[3]		
When to investigate	Always send samples before starting lengthy treatment.[1] Send specimens of nail clippings or scrapings for fungal microscopy and culture.[3] False-negative rates are high (about 30%).[3] Therefore repeat the test if the result is negative, and there is high clinical suspicion that the nail is infected.[3]		
How to respond to a positive lab result	For infections with dermatophytes use oral terbinafine or intraconazole.[4] Terbinafine is more effective than azoles.[4A+] If candida or non-dermatophyte infection confirmed, use oral itraconazole.[4B+]		
General advice	Liver reactions 0.1-1% with oral antifungals.[4A+] Monitor liver function and discontinue if LFTs raised or symptoms of liver toxicity. For children (under 18), seek specialist advice if oral treatment is considered necessary as fungal nail infection is rare in children, and the preferred treatments are not licensed for use in children.[4C]		
Treatment choices	**Superficial only:** **Amorolfine** 5% nail lacquer[B-] 1-2x / weekly[1] ***Fingernails:*** 6 months ***Toenails:*** 12 months	**First line:** **Terbinafine**[A+] 250mg oral *od* ***Fingernails:*** 6 weeks ***Toenails:*** 12 weeks	**Second line:** **Itraconazole**[A+] 200mg oral *bd* for 7 days each month. ***Fingernails:*** 2 courses ***Toenails:*** 3 courses
		Stop treatment when continual, new, healthy, proximal nail growth.[4] To prevent recurrence: apply weekly 1% topical antifungal cream to entire toe area.[4]	
Evidence	Treatment does not always cure the infection.[3] Cure rates range between approximately 60-80%.[3] The PHE Mycology Reference Laboratory recommends itraconazole for non-dermatophyte infections because although some of the infecting organisms are not particularly susceptible to this agent in vitro, it does reach high concentrations in nail tissue. It can be given as a pulse therapy regimen rather than continuous treatment.[4]		
References	1. PHE Fungal skin and nail infections 2011. **https://www.gov.uk/government/publications/fungal-skin-and-nail-infections-diagnosis-and-laboratory-investigation** (Accessed April 2017) 2. Roberts DT, Taylor WD, Boyle J. Guidelines for treatment of onychomycosis. British Journal of Dermatology 2003;148:402-410 **Guidelines for treatment of onychomycosis - Roberts - 2003 - British Journal of Dermatology - Wiley Online Library** 3. Clinical Knowledge Summaries – Fungal Nail Infection **http://cks.nice.org.uk/fungal-nail-infection#!scenario** Accessed April 2017 4. Management of Infection Guidance for Primary Care, PHE & BIA. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** (accessed September 2017)		

Skin & Soft Tissue Infections – Varicella Zoster (chicken pox), Herpes Zoster (shingles) & Cold Sores

When to treat	For chicken pox and shingles: Pregnant/immunocompromised/neonate: Seek urgent specialist advice.[1B+] **Chicken pox:** Consider treatment if started <24h of rash onset & one of the following: >14 years of age; severe pain; dense/oral rash; 2° household case, steroids, smoker or people with chronic skin disorder, severe lung or cardiovascular disease.[1,2] In a review in children and adolescents, aciclovir within 24h of rash onset shortened fever by approximately one day and reduced the maximum number of lesions but did not reduce the complication rate.[1] **Shingles:** Treat if >50 years old and if <72 h of rash onset or if one of the following: non-truncal involvement; active ophthalmic; Ramsey-Hunt; eczema; moderate/severe pain or rash.[1,3] If is not possible to start treatment within 72 hours, antiviral treatment can be considered up to 1 week after rash onset, especially if the person is at higher risk of severe shingles or complications. Treat and/or urgently refer patients with ophthalmic involvement.[3] Immunocompetent children: antivirals not recommended.[3] **Cold sore:** Resolve after 7-10 days without treatment. Topical antivirals applied prodromally reduce duration by 12-18hrs.[1]	
When to test	**Chicken pox:** Laboratory tests can be used for confirmation but are rarely required in primary care.[2] **Shingles:** Seek specialist advice for anyone who is thought to be immunocompetent and has had two episodes of shingles or if there is diagnostic uncertainty.[3]	
General advice[2,3]	Prescribe appropriate analgesia where necessary. Consider offering paracetamol if pain or fever associated with chicken pox is causing distress (avoid nonsteroidal anti-inflammatory drugs). Note that oral paracetamol is not licensed for use in children less than 2 months of age. Consider chlorphenamine for treating itch associated with chicken pox in patients 1 year of age or older.[2]	
Treatment choices	**First line chicken pox/shingles:** **Aciclovir**[A+] 800mg orally five times a day for 7 days[1B+] **Cold sore:** **Topical Aciclovir** 5% 4-hourly during waking hours for 5-10 days[4]	***Second line for shingles if compliance a problem (as more expensive)***[1] **Valaciclovir**[B+] 1g orally *TDS* for 7 days[B+] ***OR*** **Famciclovir**[B+] 500mg orally *TDS* or 750mg orally *BD* for 7 days[B+]
Evidence	Evidence from RCTs supports treatment for all those over 50 years to prevent the incidence of post-herpetic neuralgia. Pregnant women are at greater risk of varicella pneumonia, and there is a risk to the foetus of foetal varicella syndrome if exposure occurs during the first 28 weeks of pregnancy, and severe disease in the neonate if varicella is contracted a week before delivery.	
References	1. Management of Infection Guidance for Primary Care, PHE & BIA. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** (accessed June 2017) 2. Clinical Knowledge Summaries – Chickenpox (revised October 2016)) **Chickenpox - NICE CKS** (Accessed June 2017) 3. Clinical Knowledge Summaries – Shingles (revised December 2016) **Shingles - NICE CKS** (Accessed June 2017) 4. BNF 73 March 2017 - September 2017 (accessed June 2017).	

Skin & Soft Tissue Infections – Scarlet Fever (Scarletina)
(FOR PAEDIATRIC GUIDELINES see page 92)

When to treat[1]

The approach to treatment of scarlet fever is the same as that of pharyngitis; no additional treatment is warranted for the skin rash. Symptoms include:

- sore throat, headache, fever, nausea and vomiting. After 12 to 48 hours the characteristic fine red rash develops (feels like sandpaper). Typically, it first appears on the chest and stomach, rapidly spreading to other parts of the body. On more darkly-pigmented skin, the scarlet rash may be harder to spot, although the 'sandpaper' feel should be present
- Fever over 38.3ºC (101ºF) or higher is common
- White coating on the tongue, which peels a few days later, leaving the tongue looking red and swollen (known as 'strawberry tongue')
- Swollen glands in the neck
- Feeling tired and unwell
- Flushed red face, but pale around the mouth. The flushed face may appear more 'sunburnt' on darker skin
- Peeling skin on the fingertips, toes and groin area, as the rash fades.[2]

When to admit[1]

- Have pre-existing valvular disease
- Are significantly immunocompromised (for example with clinically-apparent HIV infection or chickenpox/ varicella).
- Have a severe complication of scarlet fever (such as acute rheumatic fever, invasive suppurative complication, toxic shock syndrome (symptoms might include confusion, vomiting or diarrhoea) or streptococcal glomerulonephritis).

General advice[1]

Scarlet fever can occur at any age, but is most common in children age 2-8 years (see guidance page 83), most frequent in winter-spring. It is a notifiable infectious disease caused by toxin producing strains of the group A streptococcus (*Streptococcus pyogenes*, GAS). Scarlet fever potentially could be confused with measles (rhinorrhea, cough, conjunctivitis), parvovirus ("slapped cheek syndrome"), EBV reaction to Amoxicillin or enterovirus/adenovirus infection with rash.[2] The primary site of infection with *S. pyogenes* is usually the throat, where it causes symptoms of pharyngitis. In rare circumstances, scarlet fever can also originate from other sites (for example an infected wound).[1] Reassure the person that scarlet fever is no longer a serious condition and that symptoms usually last for 1 week.
Advise the person to: stay away from school or work for 1 day after starting antibiotic treatment, wash their hands frequently, avoid sharing eating utensils and towels, dispose of handkerchiefs promptly, and avoid contact with anyone at particular risk of infection (e.g. people with valvular disease or who are immunocompromised). Offer Ibuprofen or paracetamol for symptom relief. Encourage the person to rest and drink adequate fluids.
Advise to return for follow up if symptoms have not improved or have worsened after 7 days.

Treatment choices

First line:
Phenoxymethylpenicillin for 10 days
Adult: 500mg every 6 hours, increased up to 1g every 6 hours if necessary;

Second line *(if allergic to penicillin)*:
Erythromycin for 10 days[3] (doses may be doubled in severe infection):
Adult: 250-500mg every 6 hours ***OR*** 0.5-1g every 12 hours;

***OR* Clarithromycin** (doses may be doubled in severe infection) **for 5 days**[4]
Adult and child over 12 years: 250mg every 12 hours.

***OR* Azithromycin: for 5 days**
Child over 12 years and Adult 500mg once daily

References

1. CKS NICE/Scarlet Fever October 2015 **Scarlet fever - NICE CKS** Accessed June 2017
2. Guidelines_for_the public health management of scarlet_fever_outbreaks_in_schools_nurseries and other childcare settings
   https://www.gov.uk/government/publications/scarlet-fever-managing-outbreaks-in-schools-and-nurseries Revised October 2017
3. BNF April 17
4. PHSE Management and treatment of common infections Revised September 2017
   https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/643046/Management_and_treatment_of_common_infections.pdf

Skin & Soft Tissue Infections – Boils, Carbuncles and Staphylococcal Carriage[1]

When to treat[1]	A **boil (or furuncle)** is an infection of the hair follicle where there is purulent extension into the subcutaneous tissue in which a small abscess forms. A **carbuncle** occurs when several adjacent boils join beneath the skin. It is an inflammatory mass that drains pus through many follicular orifices. Boils and carbuncles are mostly caused by *Staphylococcus aureus* (*S. aureus*). Sometimes rarer strains of *S. aureus*, such as methicillin-resistant *Staphylococcus aureus* (MRSA) and Panton-Valentine leukocidin (PVL-SA), can cause boils and carbuncles. Urgent same-day incision and drainage should be arranged for all fluctuant boils (unless they are small in which case they will usually drain spontaneously after application of moist heat) and all fluctuant carbuncles. Admission for intravenous antibiotics should be considered if the person is systemically unwell, has cellulitis, is immunocompromised or has an infection in an area where complications can be serious (such as the face). If the boil or carbuncle is not fluctuant and admission is not required application of moist heat 3-4 times a day helps to alleviate pain and hasten draining of the pus; the person should be advised to seek medical advice if the boil or carbuncle becomes fluctuant, or they become systemically unwell. A course of antibiotics should be prescribed if there is cellulitis, fever, a facial lesion or severe pain, a carbuncle is present or there are other comorbidities, such as diabetes or immunosuppression. Staphylococcal carriage (colonization) refers to the asymptomatic carriage of *S. aureus* on a person's skin or mucous membranes. The most common site of colonization by *S. aureus* is the nose. Staphylococcal carriage is a risk factor for recurrent boils and carbuncles.
When to investigate[1]	Consider taking a swab of pus from the contents of the lesion if the boil or carbuncle is not responding to treatment or if persistent or recurrent in order to exclude atypical mycobacteria or PVL-SA. Consider taking a swab if there are multiple lesions or if the patient is immunocompromised, is known to be colonised with MRSA or has diabetes.[1] **If PVL-SA is suspected, this should be mentioned specifically on the laboratory form.** Swabs of the nose should be taken to test for staphylococcal carriage if recurrent boils are in the facial area. If recurrent boils are more extensive, swabs should also be taken from the perineum, groin, axilla and umbilicus.
How to respond to a positive lab result[1]	**If PVL-SA or MRSA is confirmed in lesion swab, management should be discussed with microbiology.** If staphylococcal carriage is confirmed, the person should be prescribed nasal and skin decolonization. Decolonization should not be started until the acute infection has resolved. For managing close contacts (household, nursing homes, care homes) please discuss with the local Health Protection Unit.
General advice[1]	Self-care advice should be offered e.g. **British Association of Dermatologists – Patient Information Leaflets (PILs)**. Patient can take paracetamol or ibuprofen as required for pain relief.
Treatment choices[1]	**First choice for adults and children older than 10 years :** oral **flucloxacillin** 500mg *QDS* for 7 days **For adults and children older than 12 year with penicillin allergy:** oral **clarithromycin** 500mg *BD* for 7 days **For pregnant or breast-feeding women:** oral **erythromycin** 500mg *QDS* for 7 days. Erythromycin is preferred for pregnant and breastfeeding women as there is more experience with its use than with clarithromycin and most studies do not suggest an association with erythromycin use in pregnancy and adverse effects on the foetus. **Nasal carriage elimination: First choice Naseptin®** cream *QDS* for 10 days. **Patients with peanut or soya allergy: Mupirocin** 2% nasal ointment TDS for 5 days. **If both mupirocin and Naseptin® are ineffective or unsuitable** seek specialist advice **Skin treatment:** Use an antiseptic preparation (such as chlorhexidine 4% body wash/shampoo or Triclosan 2%) daily as liquid soap in the bath, shower, or sink for 5 days. Use as a shampoo on the first, third and fifth day. Consider Dermol® for people with skin conditions or delicate skin.
Evidence	This guideline is based on NICE CKS information.
References	1. **https://cks.nice.org.uk Boils, carbuncles, and staphylococcal carriage - NICE CKS** revised January 2017

Skin & Soft Tissue Infections – Pilonidal Sinus

When to treat	Consider treatment with antibiotics if cellulitis is suspected.[1]		
When to investigate	Arrange for urgent same-day incision and drainage for most people with acute pilonidal abscess or discharging pilonoidal sinus disease.[2,3,6] The recommendation to offer referral for consideration of surgery for a person who has discharging pilonidal sinus disease is based on a number of guidelines.[7]		
General advice	• Advise a 'watch and wait' approach for a person with asymptomatic pilonidal sinus disease, and reassure that treatment is not necessary.[2] • Advise the person about meticulous perianal hygiene with regular baths or showers.[2,5] • **Offer paracetamol for pain and/or fever.** If the response is insufficient, also offer a nonsteroidal anti-inflammatory drug (NSAID) such as ibuprofen or naproxen (unless not tolerated or contraindicated).4		
Treatment choices[7]	**Flucloxacillin** 500mg *QDS* for 7 days	**Clarithromycin** 500mg *BD* for 7 days (in penicillin allergic patients)	**Erythromycin** 500mg *QDS* for 7 days (in penicillin allergic patients who are pregnant or breastfeeding)
	***PLUS* Metronidazole** 400mg *TDS* for 7 days		
Evidence[2]	This guideline is based on NICE CKS information.		
References	1. O'Meara, S.M., Cullum, N.A., Majid, M. and Sheldon, T.A. (2001) Systematic review of antimicrobial agents used for chronic wounds. *British Journal of Surgery* 88(1), 4-21. 2. Kitchen, P. (2010) Pilonidal sinus. Management in the primary care setting. *Australian Family Physician* 39(6), 372-375 3. Thompson, M.R., Senapati, A. and Kitchen, P. (2011) Simple day-case surgery for pilonidal sinus disease. *British Journal of Surgery* 98(2), 198-209. 4. Timmons, J. (2007) Diagnosis, treatment and nursing management of patients with pilonidal sinus disease. Nursing Standard (Royal College of Nursing (Great Britain) : 1987)21(52), 48-56; 58. 5. Marza, L. (2013) Reducing the recurrence of pilonidal sinus disease. *Nursing Times* 109(25), 22-4. 6. Gordon, P., Grant, L. and Irwin, T. (2014) Recurrent pilonidal sepsis. *Ulster Medical Journal* 83(1), 10-12 7. **https://cks.nice.org.uk/pilonidal-sinus-disease**		

Skin & Soft Tissue Infections – Surgical Site Infection (SSI)	
Rationale	People who develop an infection need to receive the treatment that is most likely to be effective in order to minimise associated morbidity. It is also important that they are not given more treatment than they need, because antibiotic therapy carries risks of adverse reactions, the development of resistant bacteria and *Clostridium difficile*-associated disease. Taking into account local resistance patterns and the results of microbiological tests will help to ensure that people receive the most appropriate treatment.[1]
When to treat	Any SSI may cause redness, delayed healing, fever, pain, tenderness, warmth, or swelling. These are the additional signs and symptoms for specific types of SSI: • A superficial incisional SSI may produce purulent discharge from the wound site but may not need antibiotic treatment. • A deep incisional SSI may also produce pus. The wound site may reopen on its own. • An organ or space SSI may show a discharge of pus coming from a drain placed through the skin into a body space or organ(abscess).[1,2]
General advice	Not all SSIs require antibiotic treatment: minor infections may respond to drainage of pus (for example, by removal of sutures) and topical antisepsis. Antibiotic therapy carries with it the risk of adverse drug reactions and the development of resistant bacteria with the associated risk of *C. difficile* diarrhoea.[2] Send culture to microbiology.
Treatment choices	When surgical site infection is suspected (i.e. cellulitis), either de novo or because of treatment failure, give the patient an antibiotic that covers the likely causative organisms. Consider local resistance patterns and the results of microbiological tests in choosing an antibiotic.[1]
References	1. NICE clinical guideline CG 74 – Surgical site infections prevention and treatment. Updated February 2017. **Surgical site infections: prevention and treatment | Guidance and guidelines | NICE** 2. **http://www.ncbi.nlm.nih.gov/books/NBK53739/**

Skin & Soft Tissue Infections – Mastitis

When to treat	Prescribe an oral antibiotic for lactating women if the women has a nipple fissure that is infected, symptoms have not improved (or are worsening) after 12-24 hours despite effective milk removal and/or breast milk culture is positive. Prescribe an oral antibiotic for all women with non-lactational mastitis.[1] Advise women to continue to breastfeed (involving a breast feeding specialist if required), including on the affected breast or express milk by hand/ pump from the affected breast to ensure effective milk removal.[1] Maintaining lactation when a woman has mastitis or breast abscess is important both for her own recovery, to prevent further complications, and for her infant's health.[2,3] Other conservative measures include reassurance that her breast should return to normal size, shape and function, simple analgesics such as paracetamol and ibuprofen for pain and discomfort and warm compresses on the breast or bathe/shower in warm water.[1,3] Arrange hospital admission if there are signs of sepsis, the infection is progressing rapidly, patient is haemodynamically unstable or immunocompromised or breast abscess is suspected. A referral should be made if there is an underlying mass or breast cancer suspected.[1]		
When to investigate	Laboratory investigations and other diagnostic procedures are not routinely carried out for mastitis. Breast milk culture and sensitivity testing should only be considered in the following cases; • no response to antibiotic treatment within two days; • recurrent mastitis; • a hospital acquired infection; • severe and unusual cases.[1,3]		
How to respond to a positive lab result	Review any culture results and ensure that an appropriate antibiotic is being used.		
General advice	Identify and manage any pre-disposing factors for mastitis including poor infant attachment to the breast, nipple damage, smoking and/or underlying breast abnormality. Give advice on hygiene measures, such as thorough and frequent hand washing, rinsing the nipple area with water before and after each feed, ensuring potentially contaminated topical nipple products are discarded and removal of nipple rings.[1]		
Treatment choices	**Lactating women[1]:** **First line:** If breast milk culture available, treat according to sensitivities otherwise **Flucloxacillin** 500mg *QDS* for 10-14 days **If allergic to penicillin: Erythromycin** 250mg-500mg *QDS* ***OR*** **Clarithromycin** 500mg *BD* for 10-14 days	**Non-lactating women[1]:** **First line: Co-amoxiclav** 625mg *TDS* for 10-14 days ***If allergic to penicillin:*** **Erythromycin** 250mg-500mg *QDS* ***OR*** **Clarithromycin** 500mg *BD* plus **Metronidazole** 500mg *TDS* for 10-14 days	**Lactating women[1]:** **Second line:** If symptoms fail to settle after 48 hours of first line treatment, send sample of breast milk for microscopy, culture and sensitivities. Prescribe **Co-amoxiclav** 625mg *TDS* for 10-14 days and review after breast milk culture results
Evidence	A Cochrane systematic review[4] found insufficient evidence to confirm or refute the effectiveness of antibiotic therapy for the treatment of lactational mastitis however guidelines from WHO do recommend them for women with infectious lactational mastitis. Use erythromycin and clarithromycin with caution in breastfeeding as limited published evidence of safety.[5]		
References	1. CKS NICE Mastitis and breast abscess August 2015. **Mastitis and breast abscess - NICE CKS** 2. WHO (2000) Mastitis. Causes and Management. World Health Organisation. **http://apps.who.int/iris/bitstream/10665/66230/1/WHO_FCH_CAH_00.13_eng.pdf** 3. GAIN (2009) Guidelines on the treatment, management and prevention of mastitis. Guidelines and Audit Implementation Network. **https://rqia.org.uk/RQIA/files/68/681b5723-6972-4e11-8a09-24cea893d430.pdf** 4. Jahanfar, S., Ng, C.J. and Teng, C. L. (2013) Antibiotics for mastitis in breastfeeding women (Cochrane Review). The Cochrane Library. **http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD005458.pub3/full** 5. Specialist Pharmacy Service, Drugs in Lactation. **https://www.sps.nhs.uk/articles/drugs-in-lactation-definitions/**		

Skin & Soft Tissue Infections – Lyme Disease (Lyme borreliosis)[1]

When to treat	Lyme disease or Lyme borreliosis (LB) is a bacterial infection spread to humans when they are bitten by a tick infected with *Borrelia burgdoferi* (Bb). The most common early symptoms in adults are flu-like symptoms of aching, fever, headaches, fatigue, sweating, joint pain, light and sound sensitivity, abnormal skin sensations. Facial palsy, headache and fever in tick season (April to October) have been shown to predict Lyme disease in children. Patients seen by a GP with an erythema migrans rash should be treated with antibiotics as Lyme disease. Patients without a rash but with symptoms suggestive of Lyme disease and a credible risk of tick exposure should have serum taken and sent to an NHS laboratory for testing. Up to a third of Lyme disease cases do NOT have a classical rash, if any at all, and absence of rash or any recollection of a tick bite does not exclude the diagnosis.
When to investigate	Before diagnostic tests are requested, a patient's risk of exposure to ticks should be properly assessed and the clinical history evaluated for features compatible with LB. Tests should not be requested if there is no significant risk of a patient having LB. It is important that relevant clinical information is provided when samples are submitted for testing. The most commonly used tests look for antibodies to Bb the organism that causes LB. The antibody response takes several weeks to reach a detectable level, so antibody tests in the first few weeks of infection may be negative. It is rare for patients to have negative antibody tests in longstanding infections.
How to respond to a positive NHS lab result	Patients with tests that are positive should be treated if presenting symptoms are compatible with active Lyme disease. If an initial test is negative but symptoms persist it is worth sending a repeat sample 3-4 weeks after the initial test. Early treatment is important to prevent spread to other tissues and to avoid late complications.
General advice	GPs can obtain advice from Rare and Imported pathogens Laboratory (RIPL) staff in working hours on **01980 612348** Symptoms may persist for several weeks after treatment for Lyme disease and if gradually improving do not need treatment. If symptoms persist or get worse then the Lyme disease serology should be repeated on fresh samples. Relapses have been documented. Longstanding neuroborreliosis may be slow to respond to treatment as damaged nerve tissue is slow to heal. Help and advice for patients is available from **www.lymediseaseaction.org.uk**, and through the NHS Choices **www.nhs.uk** and PHE (**www.gov.uk/phe**) websites.
Treatment choices	Erythema migrans +/- focal symptoms, duration of treatment is for 21 days. Oral antibiotics recommended are : First line: **Doxycyline* 100mg *BD* or 200mg *OD*** *Doxycycline use is contra-indicated for children aged under 12 years and for pregnant and breastfeeding women. The use of doxycycline for children aged 9 years and above in infections where doxycycline and azithromycin is considered first line in adult practice is accepted specialist practice. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See NICE guideline for full ingormation on children under 12[2]. Second line: **Amoxicillin 1g *TDS OR* Azithromycin 500mg *od*** for 17 days**.** Erythromycin is not recommended for treating any stage of LB as it has a high failure rate. Newer macrolides such as clarithromycin or azithromycin may be used if first line antibiotics are contra-indicated but patients should be carefully followed up clinically as treatment failures can occur with these agents.
	Intravenous treatment with **Ceftriaxone 2g *bd* for 21 days** (for more details see **NICE Guidance** ng95)
Evidence	This guideline is based on PHE information.
References	1. **Lyme disease: diagnosis and treatment - GOV.UK** 2. Lyme disease NICE guideline [NG95] **https://www.nice.org.uk/guidance/ng95**

Eye
Infections

Eye Infections – Infective Conjunctivitis
(FOR PAEDIATRIC GUIDELINES see page 93)

When to treat	Acute infective conjunctivitis may affect one or both eyes. It usually presents with eye irritation or a vague foreign body sensation accompanied by tear production, discharge (which may stick the eyelids together upon waking) and red eye.[1] Infective conjunctivitis may be viral or bacterial – it is difficult to clinically distinguish between the two.[1] Acute infective conjunctivitis is usually self-limiting therefore a 'wait and see' or delayed prescribing approach is likely to be most appropriate.[1] Consider starting treatment if no improvement after 3 days.[1] Consider offering a topical antibiotic if the conjunctivitis is severe (consider to be severe when the person considers the symptoms to be distressing or the signs are judged to be severe from clinical experience).[2] Clinical resolution occurs within 2-5 days in 65% of confirmed bacterial conjunctivitis cases treated with placebo.[1]	
When to investigate	If any of the following symptoms are present, refer the patient for specialist same-day assessment to exclude acute glaucoma, keratitis, iritis or orbital cellulitis: Significant photophobia; reduced visual acuity; pain deep in the eye; recent eye surgery; absent or sluggish pupil response; irregular pupils; corneal damage or opacity on fluorescein staining; restricted or painful eye movements; history of head/eye trauma.[1] Swab the eye to identify the infective cause when infective conjunctivitis is hyper-acute or persistent. This is not usually considered useful for people with acute infective conjunctivitis.[2] Patients should be advised to seek medical advice if symptoms do not settle within 7 days, or if there is visual disturbance, significant eyelid swelling, photophobia or pain in the eye.[1]	
Treatment choices	**First line:** **Chloramphenicol**[B+] 0.5% drop 2-hourly for 2 days then 4-hourly (whilst awake). Add 1% ointment at night for severe infections or if slow to respond[D] (incurs additional prescription charge). Continue for 48h after symptom resolution.	**Second line:** **Fusidic acid** 1% gel (modified-release eye drops) *bd*[B-] Continue for 48h after symptom resolution.
General advice	Self-management: Bathe eyes with tepid water, wiping away from the bridge of the nose to the side. Avoid contact lenses until symptoms have cleared. Exercise hand hygiene and avoid sharing towels or pillows.[1] Public Health England (PHE) advises that it is not necessary to stay away from work or school unless the patient is feeling particularly unwell. **https://www.nhs.uk/conditions/conjunctivitis/#work-and-school**	
Evidence	Fusidic acid has less Gram-negative activity than chloramphenicol.[3] A double-blind placebo-controlled RCT in children showed, at day 7, 83% clinical cure with placebo compared with 86% with chloramphenicol.[4] Minimum difference in duration of moderate symptoms was observed between patients given immediate and treatment delayed by 3 days.[5] Delayed prescribing of antibiotics appears to reduce antibiotic use (almost 50%) with similar symptom control to immediate prescribing.[5]	
References	1. Management of acute infective conjunctivitis. Drug and Therapeutics Bulletin 2011; 49(7): 78-80 2. **http://cks.nice.org.uk/conjunctivitis-infective** (last accessed Oct 2016) 3. Management of Infection Guidance for Primary Care, PHE & BIA, Jan 2012 **https://www.gov.uk/government/publications/managing-common-infections-guidance-for-primary-care** (Accessed Oct 2016) 4. Rose PW et al. Chloramphenicol treatment for acute infective conjunctivitis in children in primary care. The Lancet 2005; 366(8479): 37-43 5. Everitt H, Little P, Smith P. A randomised controlled trial of management strategies for acute infective conjunctivitis in general practice. BMJ 2006; 333(7563): 32	

Eye Infections – Blepharitis

When to treat	The diagnosis of blepharitis is suggested by characteristic symptoms such as itchy, burning, and sticky eyes, the presence of associated conditions such as acne rosacea and seborrheic dermatitis and the presence of dry eye syndrome.[1] Blepharitis is a chronic condition. Treatment can control symptoms and prevent complications, however, periodic relapses and exacerbations can occur.[1] Success is dependent on compliance with treatment.[2] Good eye lid hygiene is the main stay of treatment.[1,2] Investigations such as eye swabs for culture are not usually required in primary care.[1]	
When to investigate	Referral for same-day ophthalmological assessment should be arranged if: • The person experiences sudden onset of visual loss, or • There are symptoms of corneal disease (such as pain or blurred vision). The eye becomes acutely painful and red.[1] Referral (urgency depending on clinical judgement) should be arranged if: • There is persistent localized disease or marked eyelid asymmetry (to exclude eyelid malignancy). • There is associated disease, such as Sjögren's syndrome. • Vision deteriorates. Depending on clinical judgement, the person can be referred to an appropriately trained optometrist. • There are ongoing symptoms despite optimal treatment in primary care. • The diagnosis is uncertain.[1]	
Treatment choices	**First line[3]:** Lid hygiene for symptom control, including: • warm compresses; • lid massage and scrubs; • gentle washing; • avoiding cosmetics.	**Second line[3]:** • topical antibiotics if hygiene measures are ineffective after 2 weeks. • chloramphenicol 1% eye ointment *BD* for 6 week trial Consider oral antibiotics if signs of meibomian gland dysfunction or acne rosacea. • Oxytetracycline 500mg *BD* initial 4 weeks then 250mg *BD* maintenance for 8 weeks • Doxycycline 100mg *OD* initial
General advice	Many patients with blepharitis have evaporative and aqueous tear deficiency; artificial tears may improve symptoms when used as an adjunct to eyelid cleansing and medications.[2] When the use of artificial tears is more than four times a day, a preservative free product should be used to avoid preservative toxicity.[2]	
Evidence	The rationale for the use of tetracyclines is based in part on small clinical trials that report efficacy of the drugs in improving symptoms in patients with ocular rosacea and improving tear break up time in patients with rosacea and meibomian gland disease.[2]	
References	1. CKS Blephritis **http://cks.nice.org.uk/blepharitis** (last accessed 18 Aug 2017) 2. AAO guidance American academy of ophthalmology. Preferred practice guidance. Blepharitis. Sept 2013. 3. Management of infection guidance for primary care for consultation and local adaptation PHE and BIA 2017 (last accessed 18 Aug 2017)	

Dental
Infections

Dental Infections – Mucosal Ulceration and Inflammation (Simple Gingivitis)

When to treat

Where possible manage precipitating factors. (Oral Trauma, anxiety or stress, certain foods & stopping smoking.)[1] Ask about frequency and duration of episodes and severity of any pain.[1] Ask about any previously tried treatments.[1]
Offer symptomatic treatment for pain, discomfort, and swelling, especially when ulcers are causing problems with eating.[1] If ulcers are infrequent, mild, and not interfering with daily activities (for example eating), treatment may not be needed.[1]

When to refer

Referral is recommended for people with a suspected underlying cause of aphthous-like ulceration, to identify and manage any underlying disease.

Refer urgently anyone with:

- Unexplained ulceration of the oral mucosa or mass persisting for more than 3 weeks.[1]
- Unexplained red and white patches (including suspected lichen planus) of the mucosa which are painful, swollen, or bleeding.[1]
- Symptoms or signs related to the oral cavity that persist for >6 weeks if a definitive diagnosis of a benign lesion cannot be made.[1]

Make a non-urgent referral for anyone with:

- Unexplained red and white patches (including suspected lichen planus) of the mucosa that are not painful, swollen, bleeding.[1]
- A suspected underlying cause of aphthous-like ulceration, suggested by history, examination, or results of investigations.[1]
- Particularly painful and disabling aphthous ulceration or if recurrences are frequent and severe and not adequately relieved by symptomatic treatments.[1]

General advice

Temporary pain and swelling relief can be attained with saline mouthwash.[2]
Chlorhexidine is the antimicrobial mouthwash of choice if severe pain limits oral hygiene or to prevent secondary infection.[2]

Treatment choices

Simple saline mouthwash	**Chlorhexidine 0.2% mouthwash**	**Hydrogen peroxide mouthwash 6%**
½ tsp salt dissolved in glass warm water[2]	(Do not use within 30mins of toothpaste) Rinse mouth with 10ml for 1 minute *bd.* Can be diluted 1:1 with water with no loss in efficacy. Discoloration of the teeth may occur[4]	Rinse mouth for 2-3 minutes with 15ml diluted in half a glass of warm water *tds*[3]

Spit out mouthwash after rinsing.[2] Use until lesions have resolved or less pain allows oral hygiene.[2]

Evidence

Evidence on antimicrobial mouthwashes for the management of aphthous ulcers is poor.[1] The quality of studies is poor and results are not consistent.[1] The recommendations are consistent with expert opinion from medical literature (Sculy et al 2003). Antimicrobial mouthwashes may reduce the duration and severity (degree of pain) of an ulcer episode, and increase the number of ulcer-free days between episodes.[1] However, antimicrobial mouthwashes do not seem to reduce the incidence of ulceration (number of new ulcers).[1]

References

1. CKS Clinical Knowledge Summaries – Aphthous Ulcer **http://cks.nice.org.uk/aphthous-ulcer** (Accessed Jun 17)
2. Scottish Dental Clinical Effectiveness Programme Drug Prescribing For Dentistry May 2016 **http://www.sdcep.org.uk/** (Accessed Jun 17)
3. BNF April 17 (Accessed Jun 17)
4. **www.Medicines.org.uk/chlorhexidine**

Dental Infections – Acute Necrotising Ulcerative Gingivitis (ANG) and Pericoronitis (PC)

When to treat and General advice	**ANG:** Refer urgently to a dentist. While the patient is waiting for referral to a dentist prescribe analgesia for pain relief.[1] Commence antibiotics (see below) and chlorhexidine (0.12% or 0.2 %) or hydrogen peroxide 6 % mouthwash. Offer advice on oral hygiene and in the acute phase, suggest a soft toothbrush to clean their teeth.[1]	
	PC: Refer to dentist urgently for irrigation and debridement.[2] Antibacterial treatment required only in presence of systemic features of infection, or of trismus or persistent swelling despite local treatment.[2] Tooth brushing, flossing, and mouthwashes have an effect only above and slightly below the gum level.[1] They are therefore ineffective in treating PC, as plaque continues to accumulate below the gum line within periodontal pockets.[1] Mouthwashes are not recommended as the only therapy because they may mask the symptoms while underlying destruction of the periodontal supporting tissue continues.[1]	
Treatment choices	**First line:**[2,3] **Metronidazole** 400mg *tds* for 3 days in conjunction with dental treatment.	**Second line:**[2,3] **Amoxicillin** 500mg *tds* for 3 days in conjunction with dental treatment (irrigation or incision and debridement).
Evidence	There is no consensus about which mouthwash should be recommended for people with ANUG.[1] CKS expert reviewers have recommended chlorhexidine or hydrogen peroxide 6% mouthwashes. A review found several small observational studies to support the use of antibiotics (Metronidazole and Penicillin) for ANUG [Hartnett and Shiloh, 1991] CKS recommends metronidazole because it is effective against anaerobes, there are some supportive case reports, and it widely recommended by experts for the treatment of ANUG.[1] [Hartnett and Shiloh, 1991; Coventry et al, 2000; American Academy of Periodontology, 2005; BNF 63, 2012] CKS found no evidence that Metronidazole is more (or less) effective than amoxicillin.[1]	
References	1. CKS Clinical Knowledge Summaries – Gingivitis and Periodontitis **http://cks.nice.org.uk/gingivitis-and-periodontitis** (Accessed Jun 2017) 2. Scottish Dental Clinical Effectiveness Programme Drug Prescribing For Dentistry Third edition January 2016, **http://www.sdcep.org.uk/** (Accessed Jun 2017) 3. BNF April 2017 (Accessed Jun 17)	

Dental Infections – Dental Abscess

When to treat	Regular analgesia should be first option until a dentist can be seen for urgent drainage, as repeated courses of antibiotics for abscess are not appropriate. Repeated antibiotics alone, without drainage are ineffective in preventing spread of infection. Antibiotics are only recommended if there are signs of severe infection, systemic symptoms or high risk of complications. Severe odontogenic infections; defined as cellulitis plus signs of sepsis, difficulty in swallowing, impending airway obstruction, Ludwig's angina. Refer urgently for admission to protect airway, achieve surgical drainage and IV antibiotics. 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 no response to first line drugs when referral is the preferred option.[1]	
General advice	Provide advice regarding food and drink to reduce the pressure and pain of the dental abscess: avoid food or drink that may be too hot or cold; consume cool, soft foods.[2] Encourage regular use of analgesics (ibuprofen and/or paracetamol is recommended if no contra-indications). Warn the individual not to exceed the recommended or prescribed dose. Analgesics should not be used to delay appropriate dental treatment but to relieve the symptoms.[2] Advise the patient that antibiotic therapy is prescribed to reduce the spread of infection; **NOT** a substitute for dental treatment.[2]	
Treatment choices	**First line:**[2,4] review at 3 days[4] **Amoxicillin** 500mg -1g *tds* ***OR*** **Phenoxymethylpenicillin** 500mg -1g *qds* for up to 5 days If spreading infection (lymph node involvement, or systemic signs, i.e. fever or malaise) ***ADD*** **Metronidazole**[4] 400mg *tds* for 5 days[4]	**Penicillin Allergy: First line:** **Metronidazole** 400mg *tds* for 5 days **Penicillin Allergy: Second line** **Clarithromycin** 500mg *bd* for up to 5 days, review at 3 days[4]
Cautions	Do not routinely provide repeat prescriptions or switch antibiotics in people who fail to respond to first-line treatment. Instead advise the person to see a dental practitioner urgently.[2] The failure of the antibiotic is not usually due to microbial resistance.[2]	
Evidence	The recommendations are based on guidance issued by the Faculty of General Dental Practitioners.[1]	
References	1. Scottish Dental Clinical Effectiveness Programme Drug Prescribing For Dentistry 2011 **http://www.sdcep.org.uk/** (Accessed Jun 2017) 2. CKS Clinical Knowledge Summaries – Dental Abscess **http://cks.nice.org.uk/dental-abscess#!topicsummary** (Accessed Jun 2017) 3. BNF 73, April 2017 (Accessed Jun 2017) 4. Management of Infection Guidance for Primary Care, PHE & BIA. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** (Accessed Dec 2017	

Dental Infections – Bacterial Parotitis

When to treat	Usually unilateral swelling of parotid gland with potential abscess formation. Parotitis can be associated with poor dental hygiene, dental caries and dehydration. The most common cause is Staph aureus (including Meticillin resistant Staph aureus – MRSA), however anaerobes and mixed infections are increasingly being identified.[1] Bacterial parotitis must be differentiated from viral parotitis which is most commonly caused by mumps.[1]		
General advice	Good oral hygiene, including regular and thorough tooth brushing. Eating soft food items, drinking lots of fluids, avoiding tobacco or smoking.		
When to investigate	Take a parotid duct pus swab for bacterial culture if pus seen parotid duct. Blood cultures if systemically unwell. Severe infections may require IV antibiotics.		
Treatment choices	**First line:** **Flucloxacillin** Oral 500 mg *QDS* for 5 days	**Penicillin allergy:** **Clindamycin** 300-450 mg *QDS* for 5 days. *High risk for *C Difficile* infection	**If known MRSA carrier:** **Doxycyline** 200mg *OD* oral for 5 days If anaerobic infection suspected/poor dentition: ***ADD*** Metronidazole 400mg *TDS* oral for 5 days
	If anaerobic infection suspected ***ADD* Metronidazole** Oral 400 mg *TDS* for 5 days		
	If symptoms are slow to resolve further days of antibiotics may be necessary, up to 14 days.		
Cautions	Surgical drainage and decompression of the gland are occasionally required if spontaneous drainage does not occur.[1]		
Evidence	*Staphylococcus aureus* is the most common organism in community-acquired parotitis and first-line antibiotic therapy should include antistaphylococcal antibiotic.[1] MRSA coverage should be considered if the patient has a history of recurrent cutaneous MRSA abscesses, residence in a nursing home with endemic MRSA, or other predisposing condition.[1]		
References	1. Fattahi TT, Lyu PE, Van Sickels JE. Management of acute suppurative parotitis. J Oral Maxillofac Surg. 2002;60:446-448. **http://www.joms.org/article/S0278-2391(02)97252-6/abstract**		

IV/IM Drugs
in the Community

IV/IMD

IV/IM Ceftriaxone – For treatment of pneumonias, UTI's and skin and soft tissue infection	
When to treat	It is beyond the scope of these guidelines to make recommendations for IV/IM antibiotic use. However in some community rapid response teams, doses of IM antibiotics such as ceftriaxone are given as part of an enhanced service to prevent hospital admissions. **In these cases the locally approved guideline should be followed including the dose.**

Purely Paediatrics

Ear, Nose and Throat Infections – Acute Rhinosinusitis (CHILDREN)

When to treat	Generally Antibiotics are not required as 80% resolve within 14 days without treatment (NNT 15). Offer adequate analgesia (**https://www.nice.org.uk/guidance/ng79**) Consider treating if most of the following are present: • symptoms for more than 10 days • marked deterioration after an initial milder phase • fever • unremitting purulent nasal discharge		
Treatment choices	**First line:** **Amoxicillin**[3] 40mg/kg *bd* (max 1g per dose) 12 hourly for **5 days** if no previous treatment in preceding 4 weeks **3-11 months:** 250mg *bd* **1 year-4 years:** 500mg *bd* **5-11 years:** 750mg *bd* **>12 years:** 1 gram *bd*	If treatment with amoxicillin in preceding 4 weeks: **Co-amoxiclav**[3] tds for 5 days **For child 1 year-5 years: co-amoxiclav** 125/31 5 mL 3 times a day **For child 6-11 years: co-amoxiclav** 250/62 5 mL 3 times a day **Child 12-17 years: co-amoxiclav tablets (500/125 mg)** every 8 hours **or co-amoxiclav 250/62** 10 mL 3 times a day	If allergic to penicillin: **Azithromycin**[3] 10mg/kg *od* for **3 days** (max per dose 500mg) **For Child 6 months-17 years:** (body-weight 15-25 kg) 200 mg once daily. **For Child 6 months-17 years:** (body-weight 26-35 kg) 300 mg once daily **For Child 6 months-17 years:** (body-weight 36-45 kg) 400 mg once daily for 3 days. **For Child 6 months-17 years:** (body-weight 46 kg and above) 500 mg once daily
Cautions	Provide safety netting information (verbal and written) – **https://what0-18.nhs.uk/professionals/gp-primary-care-staff/safety-netting-documents-parents** Aim to use an antibiotic that minimises dosing frequency[1] and is palatable (if suspension prescribed[2]) to optimise adherence. Penicillin V and flucloxacillin suspensions given qds are not well tolerated by children.		
References	1. Srivastava K, Arora A, Kataria A, Cappelleri JC, Sadosky A, Peterson AM. Impact of reducing dosing frequency on adherence to oral therapies: a literature review and meta-analysis. Patient Prefer Adherence. 2013; 7: 419-34. **https://www.ncbi.nlm.nih.gov/pubmed/23737662** 2. Gee SC, Hagemann TM. Palatability of liquid anti-infectives: clinician and student perceptions and practice outcomes. J Pediatr Pharmacol Ther. 2007; 12(4): 216-23. **https://www.ncbi.nlm.nih.gov/pubmed/23055856** 3. cBNF Sept17-18		

Ear, Nose and Throat Infections – Acute Otitis Externa (CHILDREN)

When to treat	If cellulitis and disease extending outside ear canal, start oral antibiotics based on sensitivities.	
Treatment choices	**First line:** **Acetic acid** 2% one spray *tds* for 7 days (unlicensed use) **Second line:** **Neomycin with corticosteroid** ear drops, three drops *tds* for 7-14 days	If cellulitis and disease extending outside ear canal, start oral antibiotics based on sensitivities. Empirical treatment with **Cefalexin**[3] 12.5mg/kg 8 hourly (max 1g per dose) **3-11 months** 125mg tds **1 year-4 years** 250mg tds **5-11 years** 500mg tds **>12 years** 1 gram tds If allergic to penicillin/cephalosporins: **Azithromycin**[3]10mg/kg *od* for **3 days** **For Child 6 months-17 years:** (body-weight 15–25 kg) 200 mg once daily . **For Child 6 months-17 years:** (body-weight 26–35 kg) 300 mg once daily . **For Child 6 months-17 years:** (body-weight 36–45 kg) 400 mg once daily . **For Child 6 months-17 years:** (body-weight 46 kg and above) 500 mg once daily
Evidence	Cure rates similar at 7 days for topical acetic acid or antibiotic +/- steroid.	
Cautions	Provide safety netting information (verbal and written) – Safety netting documents for parents: Healthier Together (**https://www.what0-18.nhs.uk/professionals/gp-primary-care-staff/safety-netting-documents-parents**) Aim to use an antibiotic that minimises dosing frequency[1] and is palatable (if suspension prescribed)[2] to optimise adherence. Penicillin V and flucloxacillin suspensions given qds are not well tolerated by children.	
References	1. Srivastava K, Arora A, Kataria A, Cappelleri JC, Sadosky A, Peterson AM. Impact of reducing dosing frequency on adherence to oral therapies: a literature review and meta-analysis. Patient Prefer Adherence. 2013; 7: 419-34. **https://www.ncbi.nlm.nih.gov/pubmed/23737662** 2. Gee SC, Hagemann TM. Palatability of liquid anti-infectives: clinician and student perceptions and practice outcomes. J Pediatr Pharmacol Ther. 2007; 12(4): 216-23. **https://www.ncbi.nlm.nih.gov/pubmed/23055856** 3. cBNF Sept17-18	

Ear, Nose and Throat Infections – Acute Otitis Media (AOM) (CHILDREN)

When to treat

Acute otitis media resolves in 60% by 24 hours without antibiotics, acute complications are rare.[1] Antibiotics only marginally reduce pain at 2 days (NNT 15) and do not prevent deafness.[1] Need to treat 4800 with antibiotics to avoid 1 case of mastoiditis.[2] Antibiotics make little difference to rates of recurrence of infection and perforated ear drum.[1]

Only consider starting oral antibiotics if any of the following criteria are met in a child presenting with AOM (bulging ear drum or discharge):

- Symptoms for 4 days or more
- Purulent discharge from ear canal (not due to otitis externa)
- Systemically unwell
- Under 6 months of age with presumed acute OM.

In child 6 months-2 years old[1]:

- Bilateral OM
- Unilateral OM and symptom score of >8 (0=no symptoms; 1=a little; 2=a lot) for the following criteria:
  - fever (>39 degrees = score of 2)
  - tugging ears
  - crying more
  - irritability
  - difficulty sleeping
  - less playful
  - eating less.

When to consider back-up prescription

Consider a back-up / watchful waiting or no prescription in children who do not fit the criteria above, including those with no otorrhoea. It is considered that most children will fall into this category, i.e. not require an immediate prescription.

Treatment choices[7]

First line if antibiotics indicated:
Amoxicillin[5] 40mg/kg 12 hourly (max 1g per dose) 12 hourly for 5 days.
3-11 months: 250mg bd
1 year-4 years: 500mg bd
5-11 years: 750mg bd
>12 years: 1 gram bd

If failed treatment with amoxicillin, **Co-amoxiclav**[5] *tds* for 5 days
For child 1 year-5 years: co-amoxiclav 125/31 5 mL 3 times a day
For child 6-11 years: co-amoxiclav 250/62 5 mL 3 times a day
Child 12-17 years: co-amoxiclav tablets (500/125 mg) every 8 hours **or co-amoxiclav 250/62** 10 mL 3 times a day)

If allergic to penicillin:
Azithromycin[5] 10mg/kg *od* for 3 days
For Child 6 months-17 years: (body-weight 15–25 kg) 200 mg once daily
For Child 6 months-17 years: (body-weight 26–35 kg) 300 mg once daily.
For Child 6 months-17 years: (body-weight 36–45 kg) 400 mg once daily
For Child 6 months-17 years: (body-weight 46 kg and above) 500 mg once daily

Cautions

Provide safety netting information (verbal and written) – Safety netting documents for parents : Healthier Together (**https://www.what0-18.nhs.uk/professionals/gp-primary-care-staff/safety-netting-documents-parents**)
Aim to use an antibiotic that minimises dosing frequency[3] and is palatable (if suspension prescribed)[4] to optimise adherence. Penicillin V and flucloxacillin suspensions given qds are not well tolerated by children.

References

1. NICE, Otitis media (acute): antimicrobial prescribing [NG91], March 2018 **https://www.nice.org.uk/guidance/ng91** Date accessed 25.5.18
2. Hoberman A, Paradise JL, Rockette HE, Shaikh N, Wald ER, Kearney DH, et al. Treatment of acute otitis media in children under 2 years of age. N Engl J Med. 2011; 364(2): 105-15. **https://www.ncbi.nlm.nih.gov/pubmed/21226576** Date accessed 25.5.18
3. Thompson PL, Gilbert RE, Long PF, Saxena S, Sharland M, Wong IC. Effect of antibiotics for otitis media on mastoiditis in children: a retrospective cohort study using the United kingdom general practice research database. Pediatrics. 2009; 123(2): 424-30. **https://www.ncbi.nlm.nih.gov/pubmed/19171605** Date accessed 25.5.18
4. Srivastava K, Arora A, Kataria A, Cappelleri JC, Sadosky A, Peterson AM. Impact of reducing dosing frequency on adherence to oral therapies: a literature review and meta-analysis. Patient Prefer Adherence. 2013; 7: 419-34 **https://www.ncbi.nlm.nih.gov/pubmed/23737662** Date accessed 25.5.18
5. Gee SC, Hagemann TM. Palatability of liquid anti-infectives: clinician and student perceptions and practice outcomes. J Pediatr Pharmacol Ther. 2007; 12(4): 216-23. **https://www.ncbi.nlm.nih.gov/pubmed/23055856** Date accessed 25.5.18
6. SPC, Amoxicillin 250mg/5ml oral suspension **https://www.medicines.org.uk/emc/product/2137/smpc** Date accessed 24.5.18
7. cBNF Sept17-18

Ear, Nose and Throat Infections – Tonsillitis (CHILDREN)

When to treat	Most young children presenting with tonsillitis have a viral aetiology. No significant difference in pain score at day 3 in children treated with antibiotics compared to those treated with placebo.[1,2] Need to treat >4000 children with antibiotics to prevent one case of quinsy.[3] Base decision to treat on FeverPAIN score[4] (1 point for each of fever, purulence, attend within 3 days of onset or less, severely Inflamed tonsils, no cough or coryza): • **score 0-1:** 18% likelihood of isolating streptococcus: use NO antibiotics • **score 2-3:** 34-40% likelihood of isolating streptococcus, use back up/delayed antibiotic or NO antibiotic • **score ≥4:** 62-65% likelihood of isolating streptococcus, use immediate antibiotic or back-up antibiotic. Score validated in children 3 years and over – younger children are less likely to have a bacterial aetiology and are less likely to develop complications.		
When to investigate	Most children with tonsillitis do not require a throat swab.		
Treatment choices	For children unable to swallow tablets: **Amoxicillin**[10] 40mg/kg *bd* (max 1g per dose) **3-11 months:** 250mg bd **1 year-4 years:** 500mg bd **5-11 years:** 750mg bd **>12 years:** 1 gram bd for 7 days.[5,6] The use of amoxicillin does not significantly increase the risk of rash in acute EBV.[7]	For children able to swallow tablets: if age 6-12 years, **Penicillin V**[10] 500mg *bd*; if age >12 years, **Penicillin V** 1g *bd* for 7 days.[5,6]	If allergic to penicillin: **Azithromycin**[10] 10mg/kg *od* for 5 days **For Child 6 months-17 years:** (body-weight 15–25 kg) 200 mg once daily **For Child 6 months-17 years:** (body-weight 26–35 kg) 300 mg once daily **For Child 6 months-17 years:** (body-weight 36–45 kg) 400 mg once daily **For Child 6 months-17 years:** (body-weight 46 kg and above) 500 mg once daily
Cautions	Provide safety netting information (verbal and written) – Safety netting documents for parents : Healthier Together (**https://www.what0-18.nhs.uk/professionals/gp-primary-care-staff/safety-netting-documents-parents**) Aim to use an antibiotic that minimises dosing frequency[8] and is palatable (if suspension prescribed)[9] to optimise adherence. Penicillin V and flucloxacillin suspensions given qds are not well tolerated by children.		

References

1. Spinks A, Glasziou PP, Del Mar CB. Antibiotics for sore throat. Cochrane Database Syst Rev. 2013; (11): CD000023. **https://www.ncbi.nlm.nih.gov/pubmed/24190439**
2. Little P, Williamson I, Warner G, Gould C, Gantley M, Kinmonth AL. Open randomised trial of prescribing strategies in managing sore throat. BMJ. 1997; 314(7082): 722-7. **https://www.ncbi.nlm.nih.gov/pubmed/9116551**
3. Petersen I, Johnson AM, Islam A, Duckworth G, Livermore DM, Hayward AC. Protective effect of antibiotics against serious complications of common respiratory tract infections: retrospective cohort study with the UK General Practice Research Database. BMJ. 2007; 335(7627): 982. **http://www.bmj.com/content/335/7627/982**
4. Little P, Stuart B, Hobbs FD, Butler CC, Hay AD, Campbell J, et al. Predictors of suppurative complications for acute sore throat in primary care: prospective clinical cohort study. BMJ. 2013; 347: f6867. **http://www.bmj.com/content/347/bmj.f6867**
5. Falagas ME, Vouloumanou EK, Matthaiou DK, Kapaskelis AM, Karageorgopoulos DE. Effectiveness and safety of short-course vs long-course antibiotic therapy for group a beta hemolytic streptococcal tonsillopharyngitis: a meta-analysis of randomized trials. Mayo Clin Proc. 2008; 83(8): 880-9. **https://www.ncbi.nlm.nih.gov/pubmed/18674472**
6. Lan AJ, Colford JM, Colford JM, Jr. The impact of dosing frequency on the efficacy of 10-day penicillin or amoxicillin therapy for streptococcal tonsillopharyngitis: A meta-analy http://adc.bmj.com/content/101/5/500sis. Pediatrics. 2000; 105(2): E19. **https://www.ncbi.nlm.nih.gov/pubmed/10654979**
7. Chew C, Goenka A. QUESTION 2: Does amoxicillin exposure increase the risk of rash in children with acute Epstein-Barr virus infection? Arch Dis Child. 2016; 101(5): 500-2. **http://adc.bmj.com/content/101/5/500**
8. Srivastava K, Arora A, Kataria A, Cappelleri JC, Sadosky A, Peterson AM. Impact of reducing dosing frequency on adherence to oral therapies: a literature review and meta-analysis. Patient Prefer Adherence. 2013; 7: 419-34 **https://www.ncbi.nlm.nih.gov/pubmed/23737662**
9. Gee SC, Hagemann TM. Palatability of liquid anti-infectives: clinician and student perceptions and practice outcomes. J Pediatr Pharmacol Ther. 2007; 12(4): 216-23. **https://www.ncbi.nlm.nih.gov/pubmed/23055856**
10. cBNF Sept 17-18
11. NICE, Sore throat (acute): antimicrobial prescribing. [NG 84] January 2018 **https://www.nice.org.uk/guidance/ng84** Date accessed June 2018

Ear, Nose and Throat Infections – Cervical Lymphadenitis (CHILDREN)

When to treat	If cervical lymphadenopathy is bilateral, non-erythematous, non- tender, with node size less than 3cm, and child systemically well, consider a no treatment, watchful waiting approach. Low threshold for treatment if child immunocompromised.	
When to investigate	See also: **https://what0-18.nhs.uk/professionals/gp-primary-care-staff/empirical-antibiotic-guidelines-primary-care**	
Treatment choices	If mild/moderate infection: **Cefalexin**[3] 12.5mg/kg 8 hourly (max 1g per dose) for 7 days, in severe infections the dosage may be doubled **3-11 months:** 125mg tds **1 year-4 years:** 250mg tds **5-11 years:** 500mg tds **>12 years:** 1 gram tds	If allergic to penicillin: **Clarithromycin**[3] *bd* for 7 days **Child 1 month-11 years:** Body-weight up to 8kg: 7.5mg/kg Body-weight 8-11kg: 62.5mg *bd* Body-weight 12-19kg: 125mg *bd* Body-weight 20-29kg: 187.5mg *bd* Body-weight 30-49kg: 250mg *bd* **Child 12-17 years:** 250mg *bd* or 500mg m/r *od*
Cautions	Provide safety netting information (verbal and written) – Safety netting documents for parents : Healthier Together (**https://www.what0-18.nhs.uk/professionals/gp-primary-care-staff/safety-netting-documents-parents**) Aim to use an antibiotic that minimises dosing frequency[1] and is palatable (if suspension prescribed)[2] to optimise adherence. Penicillin V and flucloxacillin suspensions given qds are not well tolerated by children.	
References	1. Srivastava K, Arora A, Kataria A, Cappelleri JC, Sadosky A, Peterson AM. Impact of reducing dosing frequency on adherence to oral therapies: a literature review and meta-analysis. Patient Prefer Adherence. 2013; 7: 419-34 **https://www.ncbi.nlm.nih.gov/pubmed/23737662** 2. Gee SC, Hagemann TM. Palatability of liquid anti-infectives: clinician and student perceptions and practice outcomes. J Pediatr Pharmacol Ther. 2007; 12(4): 216-23. **https://www.ncbi.nlm.nih.gov/pubmed/23055856** 3. cBNF Sept17-18	

Respiratory Tract Infections – Community Acquired Pneumonia (CAP) (CHILDREN)

When to treat	Most lower respiratory tract infections are of viral aetiology - consider bacterial pneumonia if persistent/recurrent fever over preceding 24-48 hours with chest wall recession and tachypnoea. Presence of generalised wheeze makes viral aetiology far more likely.		
When to investigate	If severe or complicated pneumonia (O2 sats<85%, haemodynamic instability/septicaemia, immunocompromised, chronic lung disease, congenital heart disease, empyema, necrotising pneumonia), for urgent review in hospital – call paediatrician.		
Treatment choices[4]	**First line:** **Amoxicillin**[3] 40mg/kg *bd* (max 1g per dose) 12 hourly **for 5 days** **3-11 months:** 250mg bd **1 year-4 years:** 500mg bd **5-11 years:** 750mg bd **>12 years:** 1 gram bd	If no response to amoxicillin: **Co-amoxiclav**[3] *tds* for 5 days **For child 1 year-5 years: co-amoxiclav** 125/31 5 mL 3 times a day **For child 6-11 years: co-amoxiclav 250/62** 5 mL 3 times a day **Child 12-17 years: co-amoxiclav** tablets **(500/125 mg)** every 8 hours **or co-amoxiclav 250/62** 10 mL 3 times a day	Treatment for atypical infections should only be considered in severe infection if no response to first line empirical therapy/ if allergic to penicillin: Use **Azithromycin**[3] **for 3 days** **For Child 6 months-17 years:** (body-weight 15–25 kg) 200 mg once daily **For Child 6 months-17 years:** (body-weight 26–35 kg) 300 mg once daily **For Child 6 months-17 years:** (body-weight 36–45 kg) 400 mg once daily **For Child 6 months-17 years:** (body-weight 46 kg and above) 500 mg once daily
Cautions	Provide safety netting information (verbal and written) – Safety netting documents for parents : Healthier Together (**https://www.what0-18.nhs.uk/professionals/gp-primary-care-staff/safety-netting-documents-parents**) Aim to use an antibiotic that minimises dosing frequency[1] and is palatable (if suspension prescribed)[2] to optimise adherence. Penicillin V and flucloxacillin suspensions given qds are not well tolerated by children.		
References	1. Srivastava K, Arora A, Kataria A, Cappelleri JC, Sadosky A, Peterson AM. Impact of reducing dosing frequency on adherence to oral therapies: a literature review and meta-analysis. Patient Prefer Adherence. 2013; 7: 419-34 **https://www.ncbi.nlm.nih.gov/pubmed/23737662** 2. Gee SC, Hagemann TM. Palatability of liquid anti-infectives: clinician and student perceptions and practice outcomes. J Pediatr Pharmacol Ther. 2007; 12(4): 216-23. **https://www.ncbi.nlm.nih.gov/pubmed/23055856** 3. cBNF Sept 17-18 4. **https://www.brit-thoracic.org.uk/document-library/clinical-information/pneumonia/paediatric-pneumonia/bts-guidelines-for-the-management-of-community-acquired-pneumonia-in-children-update-2011/**		

Urinary Tract Infections – UTI in Children

When to treat

Consider UTI in any sick child and every young child with unexplained fever.[5A+] Consider differential diagnoses: sepsis, meningitis, GI obstruction, appendicitis, gastroenteritis. Other differentials for dysuria/discomfort include vulvovaginitis and threadworms.
UTIs in children require prompt treatment to minimise the risk of renal scarring.[4]
Child < 3 months with temp ≥38°C: refer urgently to secondary care for assessment.[4,5]
Child 3 months - 3 years: send MSU for culture.[4,5]
Child ≥ 3 years: use positive dipstick to indicate antibiotics and send MSU for culture.[4,5]
If nitrites and/or leuk +ve on dipstick and temp ≥38°C, assume upper UTI[4] and empirically start treatment. Delay the decision about treating with an antibiotic until the results of urine culture are available for children who have no specific symptoms for UTI, and are at intermediate risk for severe illness (and the urine dipstick tests for nitrite and leukocyte esterase are negative) or low-risk for serious illness.
Send pre-treatment MSU for all children ≥3 months.[5]
Imaging: only refer if child <6 months, recurrent or atypical UTI.[4]
See Healthier Together **https://what0-18.nhs.uk/professionals/gp-primary-care-staff/empirical-antibiotic-guidelines-primary-care**

When to investigate

Whenever possible a specimen of urine should be collected for culture and sensitivity testing before starting antibacterial therapy – clean catch if possible.[5]

QuickWee method of stimulating suprapubic area with saline-soaked gauze significantly reduces the time taken to successfully collect a urine sample in infants:

Treatment choices

>3 months of age with lower UTI/cystitis:
Trimethoprim[3] 4mg/kg 12 hourly (max 200mg/dose). **For 3 days**

- **For Child 6 weeks-5 months:**
  4 mg/kg twice daily (max. per dose 200 mg), alternatively 25 mg twice daily.
- **For Child 6 months-5 years:**
  4 mg/kg twice daily (max. per dose 200 mg), alternatively 50 mg twice daily.
- **For Child 6-11 years:**
  4 mg/kg twice daily (max. per dose 200 mg), alternatively 100 mg twice daily.
- **For Child 12-17 years:** 200 mg twice daily.

If previous treatment with trimethoprim in preceding 3 months, use **Nitrofurantoin**[3] immediate release 750mcg/kg *qds* (if able to swallow tablets)
Child 12-17 years 100mg m/r *bd*
***OR* Cefalexin**[3] **(double if severe infection)**12.5mg/kg 8 hourly:
3-11 months: 125mg *tds*, **1 year- 4 years:** 250mg *tds*,
5-11 years: 500mg *tds*, **>12 years:** 1 gram *tds*
If confirmed severe penicillin allergy and unable to swallow nitrofurantoin tablets:
Ciprofloxacin[3] 10mg/kg *bd* (double dose in severe infection) max 750mg *bd*

>3 months of age with upper UTI/pyelonephritis (all children with a febrile UTI should be considered to have pyelonephritis)
Duration of antibiotic course 7 days:

Treat empirically with **Cefalexin**[3] 12.5mg/kg 8 hourly unless unable to tolerate oral antibiotics or systemically unwell (suggestive of bacteraemia).
3-11 months 125mg *tds*, **1 year- 4 years** 250mg *tds*,
5-11 years 500mg *tds*, **>12 years** 1 gram *tds*

If confirmed severe penicillin allergy:

Ciprofloxacin[3] 10mg/kg bd (double dose in severe infection) max 750mg *bd*

If unable to tolerate oral antibiotics or systemically unwell (suggestive of bacteraemia), requires review in hospital for consideration of IV antibiotics – call paediatrician.

continued overleaf

Urinary Tract Infections – UTI in Children (continued)

Treatment (contd.)

Preventing recurrence:

- Address dysfunctional elimination syndromes and constipation.[4]
- Encourage children to drink an adequate amount.[4]
- Emphasize the importance of not delaying voiding. Children should have ready access to clean toilets.[4]

Cautions

Provide safety netting information (verbal and written) –
https://www.what0-18.nhs.uk/professionals/gp-primary-care-staff/safety-netting-documents-parents
Aim to use an antibiotic that minimises dosing frequency[1] and is palatable (if suspension prescribed)[2] to optimise adherence. Penicillin V and flucloxacillin suspensions given qds are not well tolerated by children.

Risk factors for recurrent UTIs

- Constipation
- Poor fluid intake
- Infrequent voiding especially at school (holding on)
- Irritable bladder (can happen following UTI)
- Neuropathic bladder
  - examine spine
- Genitourinary abnormalities
  - examine genitalia

Evidence

This guideline cites a range of studies, that suggest that all infants and children who have bacteriuria and either fever of 38°C or higher, or loin pain/tenderness, should be considered to have acute pyelonephritis/upper urinary tract infection. All other infants and children who have bacteriuria, but no systemic symptoms or signs, should be considered to have cystitis/lower urinary tract infection.[4,5] Findings indicated that shorter courses of antibiotics (seven to 10 days) improved compliance, decreased antibiotic-related adverse events, and diminished the emergence of resistant organisms. Antibiotics with low local resistance patterns have therefore been chosen.[4] Nitrofurantoin is now contraindicated in patients with an estimated glomerular filtration rate (eGFR) of less than 45 ml/min. However may be used with caution in certain patients with an eGFR of 30 to 44 ml/min.[6] if a short course (max 7 days) is prescribed.

References

1. Srivastava K, Arora A, Kataria A, Cappelleri JC, Sadosky A, Peterson AM. Impact of reducing dosing frequency on adherence to oral therapies: a literature review and meta-analysis. Patient Prefer Adherence. 2013; 7: 419-34 **https://www.ncbi.nlm.nih.gov/pubmed/23737662**
2. Gee SC, Hagemann TM. Palatability of liquid anti-infectives: clinician and student perceptions and practice outcomes. J Pediatr Pharmacol Ther. 2007; 12(4): 216-23. **https://www.ncbi.nlm.nih.gov/pubmed/23055856**
3. cBNF Sept 17-18
4. NICE. Urinary Tract Infection in Children 2007. (Clinical Guideline 54). **http://www.nice.org.uk/CG54** (Accessed Jan 2018)
5. PHE. Diagnosis of UTI – Quick Reference Guide for primary care. June 2017 **https://www.gov.uk/government/publications/urinary-tract-infection-diagnosis** (Accessed Jan 2018)
6. MHRA 2014. **https://www.gov.uk/drug-safety-update/nitrofurantoin-now-contraindicated-in-most-patients-with-an-estimated-glomerular-filtration-rate-egfr-of-less-than-45-ml-min-1-73m2**

Skin & Soft Tissue Infections – Cellulitis & Impetigo (CHILDREN)

When to treat	Cellulitis presents with an acute onset of red, painful, hot, swollen, and tender skin, with possible blister or bullae formation. The leg is the most commonly affected site, presentation is usually unilateral. Often (but not always) associated with a break in the skin (portal entry). If patient afebrile and tolerating oral antibiotics, can be managed in primary care. Caution with immunocompromised patients. Most children with infected eczema do not benefit from antibiotic therapy (oral or topical) - except those with a severe infection. Optimisation of topical steroids is the mainstay of treatment in these patients.[1]		
When to investigate	Most children with cellulitis or impetigo do not require skin swabs sent, unless portal of entry, extensive infection, not responding to treatment or recurrent episodes. If recurrent or severe staph aureus infection, consider requesting PVL testing.		
Treatment choices	**If mild/moderate infection:** **Cefalexin**[4,5,6] 12.5mg/kg 8 hourly (max 1g per dose) **for 5 days**. Double if severe infection **3-11 months:** 125mg *tds* **1 year-4 years:** 250mg *tds* **5-11 years:** 500mg *tds* **>12 years:** 1 gram *tds*	**If facial cellulitis:** **Co-amoxiclav**[4] **for 5 days** **For child 1 year-5 years: co-amoxiclav** 125/31 5 mL 3 times a day **For child 6-11 years: co-amoxiclav 250/62** 5 mL 3 times a day **Child 12-17 years: co-amoxiclav tablets (500/125 mg)** every 8 hours **or co-amoxiclav 250/62** 10 mL 3 times a day	**If allergic to penicillin:** **Clarithromycin**[4] *bd* for 5 days Child 1 month - 11 years Body-weight up to 8kg: 7.5mg/kg Body-weight 8-11kg: 62.5mg *bd* Body-weight 12-19kg: 125mg *bd* Body-weight 20-29kg: 187.5mg *bd* Body-weight 30-49kg: 250mg *bd* Child 12-17 years, 250mg *bd* or 500mg m/r *od*
Evidence	Provide safety netting information (verbal and written) – **https://www.what0-18.nhs.uk/professionals/gp-primary-care-staff/safety-netting-documents-parents** Aim to use an antibiotic that minimises dosing frequency[2] and is palatable (if suspension prescribed)[3] to optimise adherence. Penicillin V and flucloxacillin suspensions given qds are not well tolerated by children.		
References	1. Francis NA, Ridd MJ, Thomas-Jones E, Shepherd V, Butler CC, Hood K, et al. A randomised placebo-controlled trial of oral and topical antibiotics for children with clinically infected eczema in the community: the ChildRen with Eczema, Antibiotic Management (CREAM) study. Health Technol Assess. 2016; 20(19): i-xxiv, 1-84. **https://www.ncbi.nlm.nih.gov/pubmed/26938214** 2. Srivastava K, Arora A, Kataria A, Cappelleri JC, Sadosky A, Peterson AM. Impact of reducing dosing frequency on adherence to oral therapies: a literature review and meta-analysis. Patient Prefer Adherence. 2013; 7: 419-34 **https://www.ncbi.nlm.nih.gov/pubmed/23737662** 3. Gee SC, Hagemann TM. Palatability of liquid anti-infectives: clinician and student perceptions and practice outcomes. J Pediatr Pharmacol Ther. 2007; 12(4): 216-23. **https://www.ncbi.nlm.nih.gov/pubmed/23055856** 4. cBNF Sept17-18 5. **https://www.ncbi.nlm.nih.gov/pubmed/6826814** Treatment of staphylococcal skin infections: a comparison of cephalexin and dicloxacillin. J Am Acad Derm **https://www.ncbi.nlm.nih.gov/pubmed/21339275atol**. 1983 Feb;8(2):177-81. 6. Chen et al Randomized controlled trial of cephalexin versus clindamycin for uncomplicated pediatric skin infections. Pediatrics. 2011 Mar;127(3):e573-80 **https://www.ncbi.nlm.nih.gov/pubmed/21339275**		

Skin & Soft Tissue Infections – Scarlet Fever (Scarlatina) (CHILDREN)

When to treat

The rash begins with papular lesions on the body that then spread to the neck, arms and. The rash is often accentuated in flexural creases but tends to spare the palms and soles of the feet. The rash is not pruritic but has a characteristic sand-paper feel to it.

Associated symptoms include:

- Sore throat/tonsillitis
- Fever
- Painful cervical lymphadenopathy
- Strawberry tongue

The presence of coryzal symptoms, cough or diarrhoea, make a diagnosis of scarlet fever unlikely.

General advice

Advise the family to keep child away from school/nursery for 1 day after starting antibiotic treatment, wash their hands frequently, avoid sharing eating utensils and towels, dispose of handkerchiefs promptly, and avoid contact with anyone at particular risk of infection (e.g. people with valvular disease or who are immunocompromised).

Treatment choices

For children unable to swallow tablets:

Amoxicillin[5] 40mg/kg bd (max 1g per dose) for 7 days.[1,2]

3-11 months: 250mg bd

1 year-4 years; 500mg bd

5-11 years: 750mg bd

>12 years: 1 gram bd

For children able to swallow tablets:

Age 6-12 years, **Penicillin V**[5] 500mg bd;
Age >12 years, **Penicillin V** 1g bd
for 7 days[1,2]

If allergic to penicillin:

Azithromycin[5] 12 mg/kg od **for 5 days**

For Child 6 months-17 years: (body-weight 15–25 kg) 200 mg once daily

For Child 6 months-17 years: (body-weight 26–35 kg) 300 mg once daily

For Child 6 months-17 years: (body-weight 36–45 kg) 400 mg once daily

For Child 6 months-17 years: (body-weight 46 kg and above) 500 mg once daily

Evidence

Provide safety netting information (verbal and written) –
https://www.what0-18.nhs.uk/professionals/gp-primary-care-staff/safety-netting-documents-parents

Aim to use an antibiotic that minimises dosing frequency[3] and is palatable (if suspension prescribed)[4] to optimise adherence. Penicillin V and flucloxacillin suspensions given qds are not well tolerated by children.

References

1. Falagas ME, Vouloumanou EK, Matthaiou DK, Kapaskelis AM, Karageorgopoulos DE. Effectiveness and safety of short-course vs long-course antibiotic therapy for group a beta hemolytic streptococcal tonsillopharyngitis: a meta-analysis of randomized trials. Mayo Clin Proc. 2008; 83(8): 880-9. **https://www.ncbi.nlm.nih.gov/pubmed/18674472**
2. Lan AJ, Colford JM, Colford JM, Jr. The impact of dosing frequency on the efficacy of 10-day penicillin or amoxicillin therapy for streptococcal tonsillopharyngitis: A meta-analysis. Pediatrics. 2000; 105(2): E19. **https://www.ncbi.nlm.nih.gov/pubmed/10654979**
3. Srivastava K, Arora A, Kataria A, Cappelleri JC, Sadosky A, Peterson AM. Impact of reducing dosing frequency on adherence to oral therapies: a literature review and meta-analysis. Patient Prefer Adherence. 2013; 7: 419-34 **https://www.ncbi.nlm.nih.gov/pubmed/23737662**
4. Gee SC, Hagemann TM. Palatability of liquid anti-infectives: clinician and student perceptions and practice outcomes. J Pediatr Pharmacol Ther. 2007; 12(4): 216-23. **https://www.ncbi.nlm.nih.gov/pubmed/23055856**
5. cBNF Sept17-18

Eye infections – Infective Conjunctivitis (CHILDREN)	
When to treat	Usually no treatment required; viral cause most likely (adenovirus, enterovirus, occasionally herpes simplex). Consider ophthalmia neonatorum in a neonate; this does not refer to a simple "sticky eye" in a neonate and requires urgent review in hospital.
Treatment choices	Consider **Chloramphenicol** eye drops 0.5% and **Chloramphenicol** eye ointment 1%. Continue until 2 days after symptoms resolved.
General Advice	Provide safety netting information (verbal and written) – **http://www.medicinesforchildren.org.uk/chloramphenicol-eye-infections-0**

Scan this QR code with your smartphone to find out about website and e-book versions of these guidelines.

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