



***Coastal West Sussex
Clinical Commissioning Group***

**Antibiotic Guidelines
for the Management of infection
in primary Care 2013**

**Adapted from the Public Health England and British Infection Association *Management of Infection Guidance for Primary Care*
by the Antibiotic Sub-group of the Hampshire and Isle of Wight Committee for Healthcare-Associated Infections (CHAIN)**

Updated for Coastal West Sussex, December 2013

Version Number	Date	Author(s) of original development or review	Details of document development
1	November 2013	Dr Janice Bates (WSHfT) Sue Taylor, Jo Munns (Antimicrobial Pharmacists WSHfT)	Adapted from the HIOW 2012 guide
2	November 2013	Jo Piper (CWS CCG Senior Pharmaceutical Commissioning Technician)	Revision
2.1	December 2013	Jo Piper (CWS CCG Senior Pharmaceutical Commissioning Technician)	Second revision
Approval for organisational use			
Community Antibiotic guidelines authorised for use in Coastal West Sussex by:	Coastal West Sussex Area Prescribing Committee (APC): November 27 th 2013		Review date: December 2014
Feedback			
Please email any relevant feedback/comments to the CWS CCG Medicines Management team inbox cwsccg.medicinesmanagement@nhs.net			

Foreword

These guidelines are intended to provide advice on the effective and safe treatment of infections commonly presenting in adults and children in the primary care setting Coastal West Sussex and adapted from the Isle of Wight and Hampshire 2012 guide. We acknowledge the hard work that went into developing these guidelines and are grateful for their kind permission to use them. 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, Sussex Community Trust Prescribers and Medicines Management team, Community Hospitals, Coastal West Sussex CCG Medicines Management team and community pharmacists.

The multi-disciplinary guideline development group consisted of general practitioners, hospital consultant medical microbiologists, a consultant in HIV / genito-urinary medicine, specialist hospital microbiology / infectious diseases pharmacists, HIOW Clinical Commissioning Group Pharmacists and ambulance trust pharmacists and a senior podiatrist (see below).

The guidelines have been updated from the previous version, published in 2008, 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 (now Public Health England, PHE) and the British Infection Association, updated in January 2012, and the guideline development group gratefully acknowledges the work of Dr Clodna McNulty 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 have also been expanded from the PHE/BIA Guidance including information about risk of *Clostridium difficile* infection. All statements are fully referenced.

The original HIOW guidelines were developed during 2011 and early 2012 and published in April 2012. The guidelines are scheduled for review in April 2014. However the CWS version was reviewed in November 2013.

Comments and feedback are welcome; please e-mail the CWS CCG Medicines Management team

cwscgg.medicinesmanagement@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.

HIOW Guideline Development Group

Anita Bhardwaj, HIV Specialist Pharmacist, Southampton Sexual Health Services
Janet Brember, Interface / Formulary Pharmacist, NHS Portsmouth
Caroline Bowyer, Chief Pharmacist, Solent NHS Trust
Tina Chambers, Clinical Nurse Specialist in Tissue Viability, Hampshire Hospitals NHS Foundation Trust (HHNFT)
Dr Helen Chesterfield, Consultant Medical Microbiologist, Portsmouth Hospitals
Debbie Cumming, Antibiotic Pharmacist, Isle of Wight NHS Trust
Dr Madelyn Dakeyne, GP Eastleigh, and District Prescribing Committee
Dr Matthew Dryden, Consultant Medical Microbiologist, Royal Hampshire County Hospital, HHNFT
Ruth Ellenby, Medicines Management Pharmacist, Calleva (Basingstoke) Clinical Commissioning Group
Carole Endean, Specialist Pharmacist, Basingstoke Hospital, Hampshire Hospitals NHS Foundation Trust
Ed England, Pharmacy Advisor, South Central Ambulance Service NHS Trust
Dr Elizabeth Fellows, GP, Portsmouth
Joanna Gibson, Specialist Pharmacist, University Hospital Southampton NHS Foundation Trust (UHSNFT)
Dr Kieran Hand, Consultant Pharmacist Anti-Infectives, UHSNFT
Kathleen Hayes, Pharmacist, Medicines Management Team, Solent NHS Trust
Taryn Keyser, Antimicrobial/Critical Care Pharmacist, Basingstoke Hospital, HHNFT
Alma Kilgarriff, CCG Lead Pharmacist, Calleva (Basingstoke) Clinical Commissioning Group
Margaret Nicholls, Senior Clinical Pharmacist, Southern Health NHS Foundation Trust
Natalie Parker, Antibiotic Pharmacist, Royal Hampshire County Hospital, HHNFT
Dr Roberta Parnaby, Consultant Medical Microbiologist, Royal Hampshire County Hospital, HHNFT
Dr David Rowen, Consultant GU/HIV Medicine, Solent NHS Trust
Dr Kordo Saeed, Consultant Medical Microbiologist, Royal Hampshire County Hospital, HHNFT
Adel Sheikh, Antibiotic / Respiratory Directorate Pharmacist, Portsmouth Hospitals NHS Trust
Dr Julian Sutton, Consultant in Infectious Diseases & Medical Microbiology, UHSNFT
Sharon Tuck, Podiatry Pathway Lead, Solent Healthcare
Mike Vickers, Specialist Pharmacist, UHSNFT
Dr Nigel Watson, Chief Executive, Wessex Local Medical Committees Ltd. Chandler's Ford
Andrea White, Locality Senior Pharmacist, Prescribing team, NHS Southampton
Dr Sarah Wylie, Consultant Medical Microbiologist, Portsmouth Hospitals NHS Trust

Western Sussex NHS Foundation Trust Antimicrobial Stewardship Group:

Dr Janice Bates, Consultant Medical Microbiologist, WSHfT
Sue Taylor, Antimicrobial Pharmacist, WSHfT
Jo Munns, Antimicrobial Pharmacist, WSHfT

Aims

- to provide a simple, empirical approach to the treatment of common infections
- to minimise the risk of precipitating *Clostridium difficile* infection
- to promote the safe, effective and economic use of antibiotics
- to minimise the emergence of bacterial resistance in the community

Principles of Treatment (PHE/BIA)

1. This guidance is based on the best available evidence, as referenced, but professional judgement should be used and patients should be involved in the decision.
2. Use simple generic antibiotics if possible. Avoid broad spectrum antibiotics (eg co-amoxiclav, quinolones and cephalosporins) when narrow spectrum antibiotics remain effective, as they increase risk of *Clostridium difficile*, MRSA and resistant UTIs.
3. A dose and duration of treatment for adults is usually suggested, but may need modification for age, weight and renal function. In severe or recurrent cases consider a larger dose or longer course.
4. Lower threshold for antibiotics in immunocompromised or those with multiple morbidities; consider culture and seek advice.
5. Prescribe an antibiotic only when there is likely to be a clear clinical benefit.
6. Consider a no, or delayed, antibiotic strategy for acute self-limiting upper respiratory tract infections ^{A+}
7. Limit prescribing over the telephone to exceptional cases.
8. Avoid widespread use of topical antibiotics (especially those agents also available as systemic preparations, e.g. fusidic acid).
9. In pregnancy AVOID tetracyclines, aminoglycosides, quinolones, high dose metronidazole (2 g). Short-term use of nitrofurantoin (at term, theoretical risk of neonatal haemolysis) is unlikely to cause problems to the foetus. Trimethoprim also unlikely to cause problems unless poor dietary folate intake or taking another folate antagonist such as antiepileptic.
10. We recommend clarithromycin as it has less side-effects than erythromycin, greater compliance as twice rather than four times daily & generic tablets are similar cost. In children erythromycin may be preferable as clarithromycin syrup is twice the cost.
11. Where a 'best guess' therapy has failed or special circumstances exist, microbiological advice can be obtained from your local hospital microbiology department.

Risk assessment

	Risk of <i>Clostridium difficile</i> 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 <i>Clostridium difficile</i> or recent hospital admission	Infection acquired in healthcare environment
Action	Withhold antibiotics if safe to do so (watchful waiting). <u>Avoid high risk antibiotics (the 4 Cs):</u> <ul style="list-style-type: none"> • Cephalosporins* • Ciprofloxacin & quinolones* • Co-amoxiclav* • Clindamycin* (indicated by an asterisk in the following tables *)	Consider second-line antibiotics and discuss with a Medical Microbiologist

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

ESBL (extended-spectrum Beta-lactamase producing organisms)

ESBLs are enzymes produced bacteria making them resistant to numerous antibiotics and they are often reported when specimens are sent for culture and sensitivity.

Please discuss with a Medical Microbiologist for treatment advice as asymptomatic bacteriuria is common and does not require treatment.

Treatment course lengths

Unless otherwise stated the duration of antibiotic treatment should be for 5 days only, based on the clinical presentation at time of diagnosis.

Contact details

Where 'best-guess' therapy had failed or special circumstances exist, seek advice from a Medical Microbiologist at your local hospital:

Worthing Hospital: 01903 205111 extn:85569

St Richard's Hospital: 01243 788122 extn: 3547

Crawley Hospital: 01293 600300 extn: 3093

East Surrey Hospital: 01737 768511 extn: 2778

Brighton and Sussex University Hospitals: 01273 696955 extn: 4615, 4596, 7516

PHE for Kent, Surrey & Sussex: 0844 225 3861

Index

1. **Ear Nose and Throat Conditions**
 - 1.1. [Acute Sore Throat](#)
 - 1.2. [Acute Otitis Media](#)
 - 1.3. [Acute Otitis Externa](#)
 - 1.4. [Acute Sinusitis](#)
2. **Respiratory Tract Infections**
 - 2.1. [Acute Cough, Bronchitis](#)
 - 2.2. [Influenza](#)
 - 2.3. [COPD Acute Exacerbation](#)
 - 2.4. [Community Acquired Pneumonia](#)
3. **Central Nervous System**
 - 3.1. [Meningitis or Suspected Meningococcal Disease](#)
4. **Urinary Tract Infections**
 - 4.0 [Fosfomycin indication, licensing and prescribing](#)
 - 4.1. [Uncomplicated UTI in Women](#)
 - 4.2. [UTI in Pregnancy](#)
 - 4.3. [UTI in Men](#)
 - 4.4. [Catheter associated UTI](#)
 - 4.5. [UTI in Children](#)
 - 4.6. [Recurrent UTI in Women](#)
 - 4.7. [Acute Pyelonephritis](#)
5. **Genital Tract Infections**
 - 5.1. [Criteria for referring to specialist care](#)
 - 5.2. [Vulvo Vaginal Candidiasis](#)
 - 5.3. [Bacterial Vaginosis](#)
 - 5.4. [Chlamydia trachomatis](#)
 - 5.5. [Trichomoniasis](#)
 - 5.6. [Pelvic Inflammatory Disease](#)
 - 5.7. [Acute Prostatitis](#)
 - 5.8. [Balanitis](#)
 - 5.9. [Epididymo-orchitis](#)
6. **Gastro-intestinal Infections**
 - 6.1. [Eradication of *Helicobacter pylori*](#)
 - 6.2. [Infectious Diarrhoea](#)
 - 6.3. [Diverticulitis](#)
 - 6.4. [Clostridium difficile](#)
 - 6.5. [Traveller's Diarrhoea](#)
 - 6.6. [Threadworms](#)
7. **Skin & Soft tissue Infections**
 - 7.1. [Impetigo](#)
 - 7.2. [Eczema](#)
 - 7.3. [Cellulitis](#)
 - 7.4. [Leg ulcers](#)
 - 7.5. [Diabetic foot Ulcer](#)
 - 7.6. [MRSA](#)
 - 7.7. [Animal Bite](#)
 - 7.8. [Human Bite](#)
 - 7.9. [Scabies](#)
 - 7.10. [Fungal infection – skin](#)
 - 7.11. [Fungal infection – fingernail or toenail](#)
 - 7.12. [Varicella zoster/chicken pox & Herpes zoster/shingles & Cold Sores](#)
 - 7.13. [Acne vulgaris](#)
8. **Eye**
 - 8.1 [Conjunctivitis](#)
9. **Dental Infections**
 - 9.1 [Mucosal ulceration and inflammation](#)
 - 9.2 [Acute necrotising ulcerative gingivitis \(ANG\) and Pericoronitis \(PC\)](#)
 - 9.3 [Dental Abscess](#)

1.1 Acute Sore Throat

When to treat¹	<p>Avoid antibiotics as 90% resolve in 7 days without, and pain only reduced by 16 hours.^{1A+} If Centor score 3 or 4: (Lymphadenopathy; No cough; fever; tonsillar exudate)^{A-} consider 2 or 3-day delayed or immediate antibiotics.^{1A+} Average total length of illness is one week.² Antibiotics to prevent quinsy NNT >4000.^{B-1,2} Antibiotics to prevent otitis media NNT 200.^{1,2A+}</p>	
When to investigate³	<p>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</p>	
Treatment Choices¹	<p>First line Phenoxymethylpenicillin^B 500mg <i>qds</i> or 1g <i>bd</i>^{A+} for 10 days^{A-} (1g <i>qds</i> when severe^D)</p>	<p>If allergic to penicillin: Clarithromycin 250-500mg <i>bd</i> for 5 days^{A+}</p>
Cautions³	<p>Prescribing amoxicillin or ampicillin will produce a generalized, itchy maculopapular rash in over 90% of people with glandular fever.³</p>	
Evidence	<ul style="list-style-type: none"> • A recent (2009) meta-analysis shows short-course (including 5 days clarithromycin) broad-spectrum antibiotics are as efficacious as 10-day penicillin for sore throat symptom treatment and GABHS eradication. A 10-day course of phenoxymethylpenicillin remains the treatment of choice. Evidence suggests the use of broader spectrum antibiotics will drive the emergence of bacterial resistance; increases the risk of developing <i>Clostridium difficile</i> associated disease; and is associated with more adverse drug reactions. 5-days clarithromycin should be reserved for those with true penicillin allergy.¹ • Glomerulonephritis is a rare condition, (2.1 per 100,000 children per year) and treating acute sore throat with antibiotics doesn't prevent it occurring.¹ • A retrospective study confirmed the low incidence of Rheumatic Fever in the UK, (0.6 per 100,000 children per year). The risk of developing Rheumatic Fever was not reduced in this study by treating sore throats with antibiotics.¹ 	
References	<ol style="list-style-type: none"> 1. Management of Infection Guidance for Primary Care, HPA & BIA, (revised Feb 2013) http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 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://www.nice.org.uk/CG69 3. CKS NICE Sore Throat – Acute. http://cks.nice.org.uk/sore-throat-acute (Accessed November 2013) 	

Ear Nose and Throat infections

1.2 Acute Otitis Media (AOM)

When to treat¹	<p>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 antibiotic prescription.^{1A+} Consider offering immediate antibiotics for pain relief if:</p> <ul style="list-style-type: none"> • <2 years AND bilateral AOM (NNT4) or bulging membrane & ≥ 3 marked symptoms^{1A+} • All ages with otorrhoea (discharge in the ear canal) NNT3^{1A+} <p>Antibiotics to prevent mastoiditis NNT >4000^{1B-}</p>	
When to investigate	<p>Routine follow up is not required in the absence of persistent symptoms.²</p>	
General Advice¹	<p>Average total length of illness is 4 days.³ Both paracetamol and ibuprofen showed a non-significant trend towards effective analgesia compared with placebo.⁴</p>	
Treatment choices	<p>First-line: Amoxicillin^{A+} 500mg – 1g TDS for 5 days For children's doses: see C-BNF</p>	<p>If allergic to penicillin: Clarithromycin^D for 5 days^{A+} 500mg BD For children's doses: see C-BNF</p>
Cautions	<p>Admission or immediate referral if: suspected acute complications of acute otitis media (AOM), such as meningitis, mastoiditis, or facial paralysis.² Consider admitting children < 3 months of age with a temperature of 38°C or more, and children 3–6 months of age with a temperature of 39°C or more.⁴</p> <p>Elective referral if: Persistent effusion or discharge, perforation not healed after 6 weeks, 4 or more episodes in 6 months or impaired hearing after 3 to 6 months.²</p> <p>Note: children with serious craniofacial abnormalities or immune deficiencies that are not responding to primary care management are at high risk of developing head and neck complications.²</p>	
Evidence	<p>Amoxicillin is as effective as other antibiotics in the treatment of AOM in RCTs.¹ Macrolides concentrate intracellularly and so are less active against the extracellular <i>H. influenzae</i>.^D No advantage in using an antibiotic to cover beta-lactamase resistant organisms (e.g. co-amoxiclav) in the initial treatment of AOM as should be reserved for persistent acute otitis media.²</p>	
References	<ol style="list-style-type: none"> 1. Management of Infection Guidance for Primary Care, HPA & BIA, Feb 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 2. CKS NICE Otitis Media – Acute. http://cks.nice.org.uk/otitis-media-acute (Accessed November 2013) 3. NICE. 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 4. NICE. Feverish illness in children. 2013. (Clinical Guideline 60). http://guidance.nice.org.uk/CG160 5. BNF for children 2013-14 	

Ear Nose and Throat infections

1.3 Acute Otitis Externa

When to treat¹	<p>First use aural toilet (if available) & analgesia.¹ Cure rates similar at 7 days for topical acetic acid or antibiotic +/- steroid.^{1A+} Consider seeking specialist advice if an oral antibiotic is thought to be required (start oral antibiotics and refer^{2A+}), such as for:</p> <ul style="list-style-type: none"> • Cellulitis extending beyond the external ear canal • When the ear canal is occluded by swelling and debris, and a wick cannot be inserted. • Diabetes or compromised immunity, and severe infection or high risk of severe infection, e.g. with <i>Pseudomonas aeruginosa</i> 				
When to investigate²	<p>Investigation is not routinely required. Laboratory investigations are rarely useful. However, if the treatment strategy fails, consider taking an ear swab for bacterial and fungal microscopy and culture. A swab is best taken from the medial aspect of the ear canal under visualisation to reduce contamination.</p>				
How to respond to a positive lab report²	<p>Identifying the organism, and especially distinguishing a fungal from a bacterial infection, can be of therapeutic significance. However, interpretation of culture results is difficult. Reported bacterial susceptibility may not correlate with clinical outcomes because sensitivities are determined for systemic (not topical) administration. Much 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. In particular, there is likely to be a fungal overgrowth after using antibacterial drops as these will have suppressed the normal bacterial flora.</p>				
Treatment choices¹	<p>First-line ear drops / spray Acetic acid (EarCalm spray®) 2% one spray <i>tds</i> for 7 days.^{1,2} Available over-the-counter from pharmacies.</p>	<p>Second-line ear drops / spray Neomycin + steroid three drops <i>tds</i> for 7-14 days.^{1,2 A+}</p>	<p style="text-align: center;">Oral antibiotics are rarely indicated²</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;"> Flucloxacillin 500mg <i>qds</i> for 7 days² </td> <td style="padding: 2px;"> If allergic to penicillin: Clarithromycin 500mg <i>bd</i> for 7 days² </td> </tr> </table>	Flucloxacillin 500mg <i>qds</i> for 7 days ²	If allergic to penicillin: Clarithromycin 500mg <i>bd</i> for 7 days ²
Flucloxacillin 500mg <i>qds</i> for 7 days ²	If allergic to penicillin: Clarithromycin 500mg <i>bd</i> for 7 days ²				
Cautions¹	<p>Aminoglycosides (e.g. neomycin and gentamicin) are contraindicated with perforated eardrum. However, many specialists do use these drops cautiously in the presence of a perforation in patients with otitis externa when other measures have failed (BNF66). Malignant Otitis Externa is an aggressive infection that affects the immunocompromised and elderly that requires prompt hospital admission.¹ Facial nerve paralysis may be an early sign. GPs should refer severe cases, characterised by unremitting pain, cranial nerve deficits, perforated tympanic membrane or history of previous ear surgery.¹</p>				
Fungal infection	<p>If <i>proven</i> fungal infection (eg. <i>Aspegillus</i> spp., <i>Candida</i> spp.): Clotrimazole 1% solution, 2-3 drops into the affected ear twice or three times a day, continuing for 14 days after disappearance of infection</p>				
Evidence	<p>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 <i>P. aeruginosa</i> (incidence 36%) and <i>S. aureus</i> (incidence 21%).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</p>				
References	<p>1. Management of Infection Guidance for Primary Care, HPA & BIA, Feb 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance 2. KKS NICE Otitis Externa. http://cks.nice.org.uk/otitis-externa (Accessed November 2013)</p>				

Ear Nose and Throat infections

1.4 Acute Sinusitis

When to treat	<p>Avoid antibiotics as 80% resolve in 14 days without, and they only offer marginal benefit after 7 days (NNT15).^{1,2A+} NICE estimates that the average duration of acute sinusitis is 2.5 weeks.² 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+} Consider 7-day delayed or immediate antibiotic when purulent nasal discharge (NNT8).^{1A+} Consider an immediate antibiotic prescription³ only if it is not appropriate to admit the person and they are:</p> <ul style="list-style-type: none"> • Systemically unwell, or • At high risk of complications because of a pre-existing comorbidity. 		
When to investigate	<p>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</p>		
Treatment choices	<p>First line: Amoxicillin^{1A+} 500mg (1g if severe^{1D}) <i>tds</i> for 7 days^{1A+} or Doxycycline¹ 200mg stat then 100mg <i>od</i> for 7 days (200mg daily for severe infections⁴). Some hospital specialists may prescribe high-dose doxycycline 200mg <i>bd</i> for 2 days then 200mg <i>od</i> for 4 days.⁵</p>	<p>If allergic to penicillin: Doxycycline² 200mg stat, 100mg <i>od</i> for 7 days^{1A+} (200mg daily for severe infections⁴).</p>	<p>Second line: In persistent infection use an agent with anti-anaerobic activity such as Co-amoxiclav^{1*} 625mg <i>tds</i> for 7 days^{1A+}</p>
Cautions ³	<p>Admit to hospital if there is severe systemic infection, or if a complication of sinusitis is suspected.³ Suspect intra-orbital involvement if there is peri-orbital oedema, 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, 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 <12yrs.⁴ * High-risk drug for <i>Clostridium difficile</i> infection and should be avoided in at-risk patients</p>		
Evidence	<p><i>S. pneumoniae</i> susceptibility to tetracycline is falling in the UK (currently 88.1%) but <i>H. influenzae</i> susceptibility to tetracycline is 98.7% compared with co-amoxiclav at 93%.⁵ Thus, although initially viral, 60% of patients with symptoms of sinusitis persisting for 10 days have bacterial infection. Restriction of therapy to only those patients would significantly reduce unnecessary prescribing.³ Ball P 2002 JAC, 49, 31-40.</p>		
References	<ol style="list-style-type: none"> 1. Management of Infection Guidance for Primary Care, HPA & BIA, Feb 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 2. NICE. 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 3. CKS NICE Sinusitis. http://cks.nice.org.uk/sinusitis (Accessed November 2013) 4. BNF 66 September 2013 5. British Society for Antimicrobial Chemotherapy Resistance Surveillance Project. www.bsacsurv.org 2009-10 		

Ear Nose and Throat infections

2.1 Acute Cough, Bronchitis

When to treat	<p>Presents as cough with or without sputum, breathlessness, wheeze or general malaise. There are no chest signs other than wheeze and crackles. If crackles are present, they should clear with coughing — if they persist, diagnose pneumonia¹. Antibiotics are not routinely indicated if the patient has no co-morbidities as they offer little benefit and may cause side effects^{1,2,3}. Viruses are responsible for more than 90% of acute bronchitis infections⁴. Studies show antibiotics reduce symptoms of cough and feeling ill by less than one day in an illness lasting several weeks in total². Consider prescribing an antibiotic if the person has a significantly impaired ability to fight infection (e.g. immunocompromised status, cancer, or those aged >75 with fever) or if acute bronchitis is likely to significantly worsen a pre-existing condition (e.g. heart failure, COPD, angina, or diabetes)¹. A delayed antibiotic prescribing strategy may be considered for people with acute bronchitis where it is felt safe not to prescribe antibiotics immediately¹. Patients should be advised to use the prescription if symptoms are not starting to settle within 2-3 weeks of their onset or if a significant worsening of symptoms occurs³.</p>		
When to investigate	<p>Routine follow-up is unnecessary¹. Re-examine people who have deteriorated to exclude pneumonia¹.</p>		
Treatment choices¹	<p>First line: Amoxicillin 500mg <i>tds</i> for 5 days</p>	<p>Second line or if penicillin allergic: Doxycycline 200 mg stat then 100 mg <i>od</i> for 5 days total</p>	<p>Third line: Consider clarithromycin 500mg <i>bd</i> for 5 days if amoxicillin or doxycycline unsuitable.</p>
General Advice	<p>Patients should be advised to use paracetamol or ibuprofen as required, drink plenty of fluids and to stop smoking¹. Advise patients that resolution of symptoms can take up to 3 weeks².</p>		
Evidence	<p>Cough medicines are not recommended, although they are unlikely to do harm. Some people may find simple remedies like honey and lemon soothing¹. Clarithromycin is active against most pathogens involved in acute bronchitis, although resistance is increasing, especially in <i>H. influenzae</i>¹. Low doses of penicillins are more likely to select out resistance². Do not use quinolones (ciprofloxacin, ofloxacin) first line due to poor pneumococcal activity. Reserve all quinolones (including levofloxacin) for proven resistant organisms².</p>		
References	<p>1. CKS NICE Cough. http://cks.nice.org.uk/cough (Accessed November 2013) 2. Management of Infection Guidance for Primary Care, HPA & BIA, Feb 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 3. NICE. 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 4. Albert R. Diagnosis and treatment of acute bronchitis. American Family Physician 2010; 82(11): 1345-1350</p>		

Respiratory Tract Infections

2.2 Influenza

When to treat	<p>Influenza is characterised by the sudden onset of fever, chills, headache, myalgia and extreme fatigue¹.</p> <p>Vaccination: Annual vaccination is essential for all those at risk of influenza². At-risk groups (not exhaustive – exercise clinical judgement): ≥65 years old; chronic heart disease (not uncomplicated hypertension); chronic respiratory, kidney, liver or neurological disease; diabetes; pregnant women (and up to 2 weeks post partum); immunocompromised individuals¹; people living in long-stay residential and nursing homes or other long-stay care facilities; all healthcare and social care staff directly involved in patient care (via their occupational health dept.) and household contacts of immunocompromised individuals³. The ideal time for immunisation is between September and early November¹.</p> <p>Treatment: For otherwise healthy adults (unless pregnant), antivirals are not recommended unless it is thought the patient is at serious risk of developing complications⁴.</p> <p>If flu is circulating in the community and if a patient in an at-risk group can start treatment within 48h of onset of flu-like illness, oseltamivir or zanamivir treatment is recommended⁵. At risk: Pregnant women (including up to 2 weeks post partum); chronic respiratory, cardiac, renal, liver or neurological disease; diabetes mellitus; 65 years or older; immunosuppressed; morbid obesity (BMI ≥40)⁴.</p> <p>For post-exposure prophylaxis, please consult most recent HPA or Department of Health guidance.</p>	
When to investigate	<p>Routine follow up in otherwise healthy patients is not necessary, but advise the person they should: Return if <i>no</i> improvement after 1 week or they are deteriorating; seek urgent medical attention if they develop shortness of breath, pleuritic chest pain or haemoptysis; 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 symptoms³.</p> <p>In at risk groups, consider follow up (particularly in frail people) after 1 week to confirm symptoms are improving and to exclude the development of secondary complications³.</p>	
Treatment choices	<p>First line⁴: Oseltamivir 75 mg <i>bd</i> for 5 days.</p>	<p>In severely immunocompromised patients or where oseltamivir resistance is suspected⁴: Zanamivir 10 mg (2 inhalations by diskhaler) <i>bd</i> for 5 days.</p>
<p>For paediatric dosing consult product literature or latest HPA guidance.</p>		
Evidence	<p>After immunisation, antibody levels may take up to 10 to 14 days to reach protective levels¹.</p> <p>In healthy individuals, seasonal influenza is an unpleasant but usually self-limiting disease with recovery in 2–7 days¹.</p> <p>Treatment after 48 hours from symptom onset is an off-label use of oseltamivir and clinical judgement should be exercised⁴.</p>	
References	<ol style="list-style-type: none"> 1. Department of Health Green Book Immunisation against infectious disease. Chapter 19 Influenza http://www.gov.uk/government/publications/influenza-the-green-book-chapter-19 Last updated September 2013 (Accessed November 2013) 2. Management of Infection Guidance for Primary Care, HPA & BIA, Feb 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 3. CKS NICE Influenza-seasonal 2013 http://cks.nice.org.uk/influenza-seasonal (Accessed November 2013) 4. HPA guidance on antiviral agents for the treatment and prophylaxis of influenza 2011-12 www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317131466016 5. NICE. 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 	

Respiratory Tract Infections

2.3 COPD Acute exacerbation

When to treat	Treat exacerbations promptly with antibiotics if increased purulence of sputum and one or both of increased shortness of breath or increased sputum volume. ^{1,2B*} 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. ³	
When to investigate	Sending sputum samples for culture in primary care is of very limited value because empirical therapy is effective and should be prescribed promptly if the sputum is purulent. Sending sputum samples in practice is not routinely recommended. ³ Pulse oximetry is of value if there are clinical features of a severe exacerbation. ³ Consider hospital admission if oxygen saturation <90%. ⁴	
Treatment choices	<p>Amoxicillin¹ 500mg <i>tds</i> for 5 days^C OR</p> <p>If allergic to penicillin: Doxycycline¹ 200mg stat, 100mg <i>od</i> for 5 days^C (200mg daily for severe infections⁵).</p> <p>Some hospital specialists may prescribe high-dose doxycycline 200mg <i>bd</i> for 2 days then 200mg <i>od</i> for 4 days.^D</p> <p>OR if allergic to penicillin & tetracyclines contra-indicated: Clarithromycin¹ 500mg <i>bd</i> for 5 days^A</p>	<p>If resistance risk factors:</p> <p>Co-amoxiclav*¹ 625mg <i>tds</i> for 5 days^A</p> <p>Risk factors for antibiotic resistant organisms include co-morbid disease, severe COPD, frequent exacerbations, antibiotics in last 3 months.¹</p>
Cautions	The following physical signs are features of a severe exacerbation (consider hospitalisation): marked dyspnoea and tachypnoea; pursed-lip breathing; use of accessory muscles at rest; acute confusion; new-onset cyanosis or peripheral oedema; marked reduction in activities of daily living. ⁴	
Evidence	<p>A meta-analysis of 21 double-blind RCTs involving 10,698 patients, concluded that a short course (≤5 days) of antibiotic treatment was as effective as the traditional longer treatment in patients with mild to moderate exacerbations of chronic bronchitis and COPD.¹ Patients who used antibiotics within 30-days of the index hospitalisation date experienced lower odds for all-cause 30-day mortality after hospitalisation than those who did not receive antibiotics (OR 0.83, 95% CI, 0.75 to 0.92). In relation to antibiotic use, macrolides had the lowest relative odds for mortality (OR 0.58, 95% CI 0.47 to 0.73) and fluoroquinolones had the highest relative odds (OR 0.98, 95% CI 0.84 to 1.15).³ Although quinolones have performed equally well in clinical trials of lower RTI, no clinical superiority over other antibiotics has yet been shown.³ Do not use ciprofloxacin* first-line due to poor pneumococcal activity. Reserve all quinolones (including levofloxacin) for proven resistant organisms.¹</p> <p>* High-risk drug for Clostridium difficile infection and should be avoided in at-risk patients</p>	
References	<ol style="list-style-type: none"> 1. Management of Infection Guidance for Primary Care, HPA & BIA, Feb 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 2. GOLD guidelines for COPD. December 2011. http://www.goldcopd.org/ 3. NICE. Chronic obstructive pulmonary disease (updated). 2010. (Clinical Guideline 101) http://guidance.nice.org.uk/CG101 4. CKS NICE Chronic obstructive pulmonary disease. http://cks.nice.org.uk/chronic-obstructive-pulmonary-disease (Accessed November 2013) 5. BNF 66 September 2013 	

Respiratory Tract Infections

2.4 Community-Acquired Pneumonia (CAP)

When to treat	The presence of either abnormal vital signs (fever >38°C, tachycardia >100/min and tachypnoea >20/min) or an abnormal physical examination of the chest (crackles, decreased breath sounds, dullness to percussion, wheeze) identified patients with radiographically confirmed CAP with a sensitivity of 95%, negative predictive value of 92% and specificity of 56%. ¹	
	Use CRB65 score to help guide and review ¹ : Each scores 1: Confusion (Abbreviated Mental Test score <8); Respiratory rate >30/min; Age >65; BP systolic <90 or diastolic ≤ 60	Score 0: suitable for home treatment; Score 1-2: hospital assessment or admission Score 3-4: urgent hospital admission Give immediate IM Benzylpenicillin or Amoxicillin 1g po (if NOT penicillin allergic) but do not delay admission. ^{1,2D}
When to investigate	For patients managed in the community microbiological investigations are not recommended routinely. ¹ Examination of sputum should be considered for patients who do not respond to empirical antibiotic therapy. ¹	
Treatment choices²	IF CRB65=0: Amoxicillin^{A+} 500mg <i>tds</i> for 5-7 days AND/OR [Clarithromycin^{A-} 500mg <i>bd</i> for 5-7 days OR Doxycycline^D 200 mg stat/100 mg <i>od</i> for 5-7 days]	If CRB65=1 & AT HOME Amoxicillin^{A+} 500mg – 1g <i>tds</i> AND Clarithromycin^{A-} 500mg <i>bd</i> both for 7 days OR Doxycycline alone 200mg stat then 100mg <i>od</i> for 7 days
	Some hospital specialists may prescribe high-dose doxycycline 200mg <i>bd</i> for 2 days then 200mg <i>od</i> for 7 days. ^D	
Cautions	In elderly patients, the classic symptoms and signs of pneumonia are less likely, and non-specific features – especially confusion – are more likely. ¹ In addition, absence of fever is more common compared to younger patients with CAP. ¹ Aspiration pneumonia is significantly more common in patients who reside in a nursing home or long-term-care facility. ⁴ <i>Do not use ciprofloxacin * first line due to poor pneumococcal activity. Reserve all quinolones (including levofloxacin) for proven resistant organisms².</i> * High-risk drug for Clostridium difficile infection and should be avoided in at-risk patients	
Evidence	Consider doxycycline, alone or combined with amoxicillin, if infection with <i>Mycoplasma pneumoniae</i> is suspected (most likely in school age children and young adults with non-severe symptoms if there is a known epidemic). ³ Mycoplasma infection is rare in over 65s. ²	
References	1. BTS. Guidelines for the Management of Community Acquired Pneumonia in Adults: 2009 Update. http://www.brit-thoracic.org.uk/guidelines/pneumonia-guidelines.aspx 2. Management of Infection Guidance for Primary Care, HPA & BIA, Feb 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 3. CKS NICE Chest infections – adults. http://cks.nice.org.uk/chest-infections-adult (Accessed November 2013) 4. Garcia-Vidal C <i>et al.</i> Low incidence of multidrug-resistant organisms in patients with healthcare-associated pneumonia requiring hospitalization. <i>Clin Microbiol Infect</i> 2011; 17: 1659–1665.	

Respiratory Tract Infections

3.1 Meningitis or Suspected Meningococcal Disease

When to treat	Transfer all patients to hospital immediately¹. IF time before admission, give IV benzylpenicillin or cefotaxime^{2,3B4}, unless hypersensitive i.e. history of difficulty breathing, collapse, loss of consciousness, or rash^{1B-}		
Treatment choices	IV or IM Benzylpenicillin¹: Neonate 75mg/kg Child 1 month-1yr 300mg Child 1yr-9 yr 600mg Child 10-18yrs 1.2g Adult 1.2g Give IM if vein cannot be found ¹ .	OR IV or IM Cefotaxime¹ Neonate 50mg/kg Child 1 month-12yrs 50mg/kg (max 1g) Child 12-18yrs 1g Adult 1g	If history of anaphylaxis to penicillins or cephalosporins⁴ Arrange immediate transfer to hospital
	Prevention of secondary case of meningitis ⁵ . Only prescribe following advice from Public Health Doctor: 9am-5pm 0845 894 2944. Out-of-hours contact 0845 967 0069.		
Cautions	For suspected meningococcal disease (meningitis with non-blanching rash or meningococcal septicaemia), give parenteral antibiotics (intramuscular or intravenous benzylpenicillin) at the earliest opportunity in primary care, but do not delay urgent transfer to hospital to give the parenteral antibiotics 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 ¹ . Expert opinion is that parenteral antibiotics (either benzylpenicillin or cefotaxime) should be administered in children as soon as invasive meningococcal disease is suspected, and not delayed pending investigations ¹ .		
References	1. Management of Infection Guidance for Primary Care, HPA & BIA, Jan 2012. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 2. NICE. Bacterial meningitis and meningococcal septicaemia. National Collaborating Centre for Women's and Children's health 2009. (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/guidelines/fulltext/102/index.html 4. BNF-C 2013-14. 5. HPA 2011 Guidance for public health management of meningococcal disease in the UK. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/MeningococcalDisease/		

Central Nervous System Infections

4 Urinary Tract Infections

People > 65 years: do not treat asymptomatic bacteriuria; it is common but is not associated with increased morbidity^{1B+} or mortality. Investigation and treatment will increase the risk of side-effects and medicalise the condition. Only sample if two or more signs of infection, especially dysuria, pyrexia > 38°C or new incontinence.

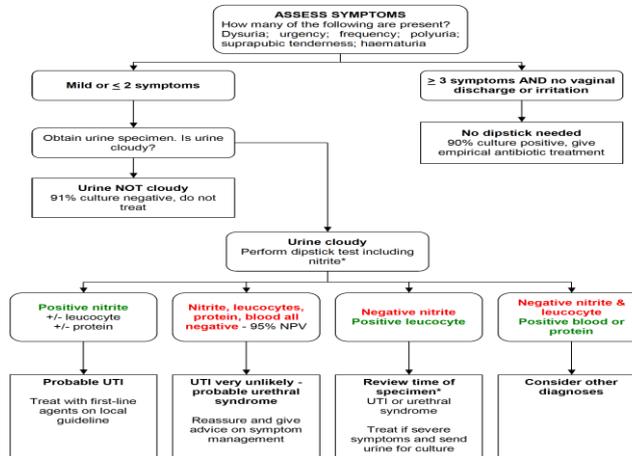
Catheter in situ: antibiotics will not eradicate asymptomatic bacteriuria; only treat if systemically unwell or pyelonephritis likely^{2B+}

Do not use prophylactic antibiotics for catheter changes unless history of catheter-change-associated UTI^{3B}

Acute uncomplicated UTI in adult women: up to 15% of women will be affected each year. Routine urine culture is unnecessary. Use symptoms, urine appearance and dipstick tests to diagnose UTI and reduce antibiotic use and unnecessary laboratory investigations. 50% of women with UTI symptoms have negative culture and symptoms are due to inflammation of the urethra – the so-called “urethral syndrome”.

In sexually-active young men and women with urinary symptoms consider *Chlamydia trachomatis*.

Diagnosis of acute uncomplicated UTI in women – Quick Reference Guide for Primary Care



* Nitrite is produced by the action of bacterial nitrate reductase in urine. As contact time between bacteria and urine is needed, morning specimens are most reliable. Leucocyte esterase detects intact and lysed leucocytes produced in inflammation. Haematuria and proteinuria occur in UTI but are also present in other conditions. When using dipstick tests, follow the manufacturer's instructions and wait for the recommended time before reading the test.

Urinary Tract Infections

Laboratory testing for culture and sensitivity should be performed in:

- **Pregnant women** at their first antenatal visit to detect asymptomatic bacteriuria (associated with pyelonephritis and premature delivery) and if symptomatic for investigation of possible UTI.
- **Suspected UTI in children, any sick child and every young child with an unexplained fever.**
- **Suspected pyelonephritis** – temperature $\geq 39.4^{\circ}\text{C}$, rigors, nausea, vomiting, diarrhoea, loin pain or tenderness.
- **Suspected UTI in men. Catheterised patient only if features of systemic infection are present** as bacteriuria is usual.
- **Failed antibiotic treatment or persistent symptoms.** Community multi-resistant *E. coli* with extended-spectrum beta-lactamase enzymes are increasing, so perform culture in all treatment failures. ESBLs are multi-resistant but usually remain sensitive to nitrofurantoin.
- **Abnormalities of the genitourinary tract or renal impairment**

4.0 Fosfomycin Indication and Licensing

When is Fosfomycin indicated?	Lower UTI due to ESBL-producing micro-organisms or on recommendation of consultant medical microbiologist. Fosfomycin is not indicated for the treatment of ESBL pyelonephritis or peri-nephric abscess (admit to hospital for IV antibiotics).
What is an ESBL?	Extended-spectrum beta-lactamases (ESBLs) are bacterial enzymes (usually plasmid-mediated) that confer resistance to a broad range of beta-lactam antibiotics including co-amoxiclav and cephalosporins.
What is Fosfomycin's licensing status in the UK?	Fosfomycin is licensed in the UK. However no UK-packaged product is currently available and thus all supplies must be obtained from abroad.
Where is Fosfomycin licensed?	Where is Fosfomycin licensed? Fosfomycin is currently licensed and can be sourced from Germany, France, Italy and Spain.
Fosfomycin supplies	Fosfomycin is not available commercially as a licensed product in the UK. Currently the only means of obtaining fosfomycin is to order from a "specials" supplier. There will be a delay in obtaining the product in the community setting and careful consideration needs to be given when prescribing and supplying to patients who may need treatment more urgently. The patient should be advised to consult GP if symptoms worsen whilst awaiting supply. Brands: These include - MONURIL® (Zambon – Italy; Netherlands) and MONUROL® (Pharmazam – Spain, USA, Hong Kong). Fosfomycin can be imported via IDIS World Medicines. There is usually a delay of 48hours between order and delivery. IDIS World Medicines: IDIS House, Churchfield Road, Weybridge, Surrey, KT13 8DB, Tel: 01932 824000; Fax: 01932 824226; Web: www.idispharma.com

Fosfomycin Prescribing Information

Mode of action	Fosfomycin is a bactericidal antibacterial. Fosfomycin inactivates the enzyme pyruvyl transferase required for the biosynthesis of peptidoglycan in bacterial cell walls. Fosfomycin is concentrated in the bladder and is active against E. coli, Proteus sp. and Enterococci.	
Dosing: Uncomplicated UTI in females	Fosfomycin 3 gram sachet as a single oral dose is effective in the treatment of uncomplicated lower urinary tract infections in adult females. Single dose therapy (3 gram) was equivalent to 7-day course of norfloxacin in a randomised, blinded study. (de Jong Z et al. 1991 Urol Int).	
Dosing: Complicated UTI or male patients	Fosfomycin trometamol 3 gram on day one, followed by a further 3 gram on day 3. Fosfomycin should be taken on an empty stomach or 2-3 hours before food. The guidelines have changed in accordance with the recent recommendations from the NICE Evidence Summary, multidrug resistant UTIs (23 July 2013)	
Dosing in renal impairment	GFR 10-50mL/min: 3gram single dose or 3grams every third day.	
Pregnancy	Animal data show no teratogenic effects. Several published reports studied the efficacy and safety of oral fosfomycin in all stages of pregnancy. In these studies fosfomycin did not cause harm to a foetus.	
Contraindications	Hypersensitivity to fosfomycin. Suspected bacteraemia. GFR <10mL/min.	
Interactions	No significant drug-drug interactions. Food intake can slow down the absorption of fosfomycin with, as a result, lower concentrations in the urine. Fosfomycin should, therefore, be administered while fasting or 2 or 3 hours before meals.	
Interactions	No significant drug-drug interactions. Food intake can slow down the absorption of fosfomycin with, as a result, lower concentrations in the urine. Fosfomycin should, therefore, be administered while fasting or 2 or 3 hours before meals.	
Side effects	<p>More common than 1%: Diarrhoea/Abdominal pain (10%) Nausea/Indigestion (5%) Headache (3-10%) Skin rashes (1%) Vaginitis (5%) Asthenia (1%)</p>	<p>Rare Serious Reactions: Serious hypersensitivity reactions Impairment of hepatic function Aplastic anaemia</p>

4.1 Uncomplicated Lower UTI in Women

When to treat	<p>Women with severe or ≥ 3 symptoms (frequency, urgency, dysuria, polyuria, suprapubic tenderness, haematuria): treat^{1B+} Women with mild or ≤ 2 symptoms: perform dipstick on cloudy urine to guide treatment (morning specimen most reliable).^{1,2}</p> <ul style="list-style-type: none"> Positive nitrite indicates probable UTI, if EITHER blood OR leucocytes also positive = 92% positive predictive value^{1A-} Negative nitrite, leucocytes <i>and</i> blood = 76% negative predictive value^{1A-} <p>Although the probability of UTI is reduced to less than 20% by a negative dipstick test, the evidence suggests that women still derive symptomatic benefit from antibiotics (NNT=4).³ 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</p>	
When to investigate	<p>Do not culture routinely for urinary symptoms in adult women <65 years.² In sexually active young women, consider <i>Chlamydia trachomatis</i>.^{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 or persistent symptoms.²</p>	
How to respond to a positive lab report²	<p>Single organism $\geq 10^4$ colony forming units (CFU)/mL or $\geq 10^5$ mixed growth with one predominant organism or <i>E. coli</i> or <i>Staphylococcus saprophyticus</i> $\geq 10^3$ CFU/mL usually indicates UTI in patient with urinary symptoms. White cells $\geq 10^4$/mL are considered to represent inflammation. In adults 'no white cells present' indicates no inflammation & reduces culture significance. Epithelial cells/mixed growth indicates perineal contamination, reducing significance of culture.</p>	
Treatment choices	<p>First line¹ Trimethoprim^{B+} 200 mg <i>bd</i> for 3 days^{1A+} OR Nitrofurantoin^{B+} 50mg <i>qds</i>⁴ (or 100mg <i>m/r bd</i>) for 3 days^{3,4}</p>	<p>Second line Perform culture in all treatment failures^{1B} Amoxicillin resistance is common; only use if susceptible.^{1B+} Community multi-resistant Extended-spectrum Beta-lactamase (ESBL) <i>E. coli</i> are increasing; consider nitrofurantoin (or fosfomycin 3g stat if sensitive, on advice of Microbiology see fosfomycin section above).</p>
Cautions	<p>Nitrofurantoin is contraindicated if eGFR<60ml/min; risk of peripheral neuropathy; ineffective due to inadequate urine concentrations.^{5,6} The activity of nitrofurantoin is reduced with increasing pH; avoid alkalising agents e.g. potassium citrate.¹</p>	
Evidence	<p>Three days of treatment with nitrofurantoin has been shown to be effective in non-pregnant adult women with uncomplicated UTI.³ If dysuria and frequency are present, the probability of UTI is > 90%.³</p>	
References	<ol style="list-style-type: none"> 1. Management of Infection Guidance for Primary Care, HPA & BIA, Jan 2012, http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 2. HPA. Diagnosis of UTI – Quick Reference Guide for primary care, April 2011, http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 3. SIGN UTI 2006 (updated July 2012) http://www.sign.ac.uk/guidelines/fulltext/88/index.html (Accessed November 2013) 4. CKS NICE Urinary Tract Infection – Lower, Women, http://cks.nice.org.uk/urinary-tract-infection-lower-women (Accessed November 2013) 5. BNF 66, September 2013 6. Sachs J <i>et al.</i> Effect of renal function on urinary recovery of orally administered nitrofurantoin. NEJM 1968; 278(19): 1032-1035. 	

Urinary Tract Infections

4.2 Lower UTI in Pregnancy

When to treat	Pregnant women with symptomatic UTI should be treated with an antibiotic. ¹ Asymptomatic bacteriuria detected during pregnancy should be treated with an antibiotic; asymptomatic bacteriuria is associated with pyelonephritis & premature delivery. ^{1,2}	
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. ^{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	Single organism $\geq 10^4$ colony forming units (CFU)/mL or $\geq 10^5$ mixed growth with one predominant organism or <i>E. coli</i> or <i>Staphylococcus saprophyticus</i> $\geq 10^3$ 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 line³: Treat for 7 days ^C Amoxicillin 250mg <i>tds</i> (<i>if known to be susceptible</i>) OR Nitrofurantoin 50mg <i>qds</i> or 100mg <i>m/r bd</i> OR Trimethoprim 200mg <i>bd</i> (off-label). Give folic acid if first trimester.	Second line³: Cefalexin* 500mg <i>tds</i> for 7 days ^{B-}
Cautions	The activity of nitrofurantoin is reduced with increasing pH; avoid alkalinising agents e.g. potassium citrate. 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} *High-risk drug for <i>Clostridium difficile</i> infection and should be avoided in at-risk patients.	
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 UTI 2006 (updated July 2012) http://www.sign.ac.uk/guidelines/fulltext/88/index.html (Accessed November 2013) 2. Management of Infection Guidance for Primary Care, HPA & BIA, Jan 2012. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 3. CKS NICE Asymptomatic bacteriuria and cystitis in women who are pregnant. http://cks.nice.org.uk/urinary-tract-infection-lower-women (Accessed November 2013) 4. UK Teratology Information Service. The treatment of infections in pregnancy. (Tel: 0844 892 0909) www.toxbase.org (Accessed November 2013, log-in required)	

Urinary Tract Infections

4.3 Lower UTI in Men

When to treat	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	
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. ^{3,4C}	
How to respond to a positive lab report	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 $\geq 10^3$ 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 ^{3,4} Treat for 7 days ^{3,4C} Trimethoprim ^{B+} 200 mg <i>bd</i> OR Nitrofurantoin ^{B+} 50mg <i>qds</i> ⁴ (or 100mg <i>m/r bd</i>)	Second line Perform culture in all treatment failures ^{3B} Amoxicillin resistance is common; only use if susceptible. ^{3B+} Community multi-resistant Extended-spectrum Beta-lactamase (ESBL) <i>E. coli</i> are increasing: consider nitrofurantoin (or fosfomycin 3g stat plus 2 nd 3g dose 3 days later according to sensitivities – on advice of Microbiology, see fosfomycin section above). ³
Cautions	Nitrofurantoin is contraindicated if eGFR<60ml/min; risk of peripheral neuropathy; ineffective due to inadequate urine concentrations. ^{5,6} At least 50% of men with recurrent UTI and over 90% of men with febrile UTI have prostate involvement, which may lead to complications such as prostatic abscess or chronic bacterial prostatitis. ¹ (Section 5.7 – Acute Prostatitis).	
Evidence	No high quality evidence for the treatment of bacterial UTI in men was identified. ¹	
References	<ol style="list-style-type: none"> 1. SIGN UTI 2006 (updated July 2012) http://www.sign.ac.uk/guidelines/fulltext/88/index.html (Accessed November 2013) 2. HPA. Diagnosis of UTI – Quick Reference Guide for primary care. April 2011. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 3. Management of Infection Guidance for Primary Care, HPA & BIA, Feb 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 4. CKS NICE Urinary Tract Infection (lower) – Men. http://cks.nice.org.uk/urinary-tract-infection-lower-men (Accessed November 2013) 5. BNF 66, September 2013 6. Sachs J <i>et al.</i> Effect of renal function on urinary recovery of orally administered nitrofurantoin. NEJM 1968; 278(19): 1032-1035. 	

Urinary Tract Infections

4.4 Catheter-associated UTI

When to treat	<p>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 harms: 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+} Symptoms that may suggest UTI in patients with catheters include fever, flank or suprapubic discomfort, change in voiding patterns, nausea, vomiting, malaise or confusion.¹</p>	
When to investigate	<p>Symptomatic catheter-associated UTI (CA-UTI) cannot be differentiated from 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 Urine samples should only be sent for laboratory culture if the patient has clinical sepsis, not because the appearance or smell of the urine suggests that bacteriuria is present.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</p> <ul style="list-style-type: none"> • If an indwelling catheter has been in place for >2 weeks at the onset of CA-UTI and is still indicated, the catheter should be replaced to hasten resolution of symptoms and to reduce the risk of subsequent CA-UTI.⁵ The urine for culture should be obtained from the freshly-placed catheter prior to the initiation of antimicrobial therapy.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 report⁶	<p>If urine culture shows that the organism is resistant to the current antibiotic, and:</p> <ul style="list-style-type: none"> • If symptoms have not resolved, change to an antibiotic that the organism is sensitive to. • If symptoms have resolved, consider continuing with the current antibiotic. • If symptoms recur, start treat with an antibiotic shown in the culture to cover the infecting organism. 	
Treatment choices	<p>Lower UTI⁶: Trimethoprim 200 mg bd for 7 days OR Nitrofurantoin 50mg qds (or 100mg m/r bd) for 7 days</p>	<p>Upper UTI (fever or loin pain)⁶: See Pyelonephritis</p>
	<p>7 days is the recommended duration of treatment for patients with CA-UTI who have prompt resolution of symptoms, and 10–14 days is recommended if response is delayed, regardless of whether the patient remains catheterised or not.⁵</p>	
Cautions	<p>Nitrofurantoin is contraindicated if eGFR<60ml/min; risk of peripheral neuropathy; ineffective due to inadequate urine concentrations.⁷</p>	
Evidence	<p>When changing catheters in patients with a long-term indwelling urinary catheter: do not offer antibiotic prophylaxis routinely. Consider antibiotic prophylaxis for patients with a history of symptomatic UTI after catheter change or who experience trauma during catheterisation.^{4b}</p>	
References	<ol style="list-style-type: none"> 1. SIGN UTI 2006 (updated July 2012) http://www.sign.ac.uk/guidelines/fulltext/88/index.html (Accessed November 2013) 2. HPA. Diagnosis of UTI – Quick Reference Guide for primary care. April 2011. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 3. European Association of Urology. Guidelines on Urological Infections 2013. http://www.uroweb.org/guidelines/online-guidelines/ 4. Management of Infection Guidance for Primary Care, HPA & BIA, Jan 2012 (revised Feb 2013). http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 5. Infectious Diseases Society of America. Diagnosis, Prevention, and Treatment of Catheter-Associated Urinary Tract Infection in Adults: 2009 International Clinical Practice Guideline http://www.idsociety.org/uploadedFiles/IDSA/Guidelines-Patient_Care/PDF_Library/Comp%20UTI.pdf (Accessed November 2013). 6. CKS NICE Lower UTI with catheter. http://cks.nice.org.uk/urinary-tract-infection-lower-women (Accessed November 2013) 7. BNF 66, September 2013 	

4.5 UTI in Children

When to treat	<p>Consider UTI in any sick child and every young child with unexplained fever.^{1A+} UTIs in children require prompt treatment to minimise the risk of renal scarring.² Child < 3 months: refer urgently for assessment^{1,3 C} Child 3 months – 3 years: send MSU for culture^{1,3 A+} Child ≥ 3 years: use positive dipstick to indicate antibiotics and send MSU for culture^{1,3 A+} 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.⁴</p>			
When to investigate	<p>Send pre-treatment MSU for all children ≥ 3 months.⁵ Imaging: only refer if child <6 months, recurrent or atypical UTI.^{3,5 C} Whenever possible a specimen of urine should be collected for culture and sensitivity testing before starting antibacterial therapy – clean catch if possible.^{1,3}</p>			
How to respond to a positive lab report	<p>Dipstick: positive nitrite & leucocytes = likely UTI.^{1,3} Nitrite positive & leucocytes negative, in sample <4hrs old = likely UTI.^{1,3} Single organism ≥ 10⁴ colony forming units (CFU)/mL indicates UTI; in supra-pubic aspirates any growth is significant.¹ White blood cells: In children pyuria may be absent or, in contrast, present due to fever without UTI.¹ Routinely review with the culture result (e.g. at around 48 hours) to ensure that the child is responding to treatment, and to reassess the choice of antibiotic.⁴</p>			
Treatment choices	See Children's BNF for doses	First line: ^{2,3,4,5}	Second line: ⁵ In accordance with sensitivity results	Preventing recurrence
	Lower UTI: Uncomplicated lower UTI in children > 3 months can be treated for 3 days ^{3A+}	Trimethoprim^A OR Nitrofurantoin^{A+} tabs (not m/r) or suspension (note: expensive)	Cefalexin^C OR Amoxicillin^A (if susceptible)	<ul style="list-style-type: none"> • Address dysfunctional elimination syndromes and constipation.³ • Encourage children to drink an adequate amount.³ • Emphasize the importance of not delaying voiding.³
	Upper UTI: consider hospital admission⁴	Co-amoxiclav^{A+} for 7-10 days ^{A+}	Cefixime^A for 7-10 days ^{A+}	
Evidence	<p>Prophylactic antibiotics for recurrent symptomatic UTI: Although it is effective in reducing the number of positive urine cultures, there is no benefit through a reduction in the number of symptomatic infections or new renal parenchymal defects.³ It is inconvenient for the patient, compliance is poor, it carries the risks associated with any medication and patients tend to become colonised with resistant organisms.³</p>			
References	<ol style="list-style-type: none"> 1. HPA. Diagnosis of UTI – Quick Reference Guide for primary care. April 2011. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 2. BNF for children 2013-14. http://bnfc.org/bnfc/index.htm 3. NICE. Urinary Tract Infection in Children 2007. (Clinical Guideline 54). http://www.nice.org.uk/CG54 4. CKS NICE Urinary Tract Infection – Children. http://cks.nice.org.uk/urinary-tract-infection-children (Accessed November 2013). 5. Management of Infection Guidance for Primary Care, HPA & BIA, Jan 2012 (revised Feb 2013). http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 			

4.6 Recurrent UTI in Women - Prophylaxis

When to treat	<p>Recurrent UTI is defined as ≥ 3 proven UTIs per year.¹ If cystitis is related to sexual intercourse, advise: Using a different contraceptive method if a diaphragm is being used; voiding soon after intercourse; using a lubricant if symptoms could be due to mild trauma rather than infection.²</p> <ul style="list-style-type: none"> • Continuous or postcoital antimicrobial prophylaxis should be considered to prevent recurrent uncomplicated cystitis in women in whom 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	<p>Seeking specialist advice before starting continuous antibiotic prophylaxis is recommended pragmatically to decide whether the woman needs investigation to exclude an underlying cause.²</p>		
How to respond to a positive lab report	<p>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</p>		
Treatment choices	<p>Non-antibiotic treatment:²</p> <ul style="list-style-type: none"> • Cranberry products reduce the recurrence rate of cystitis, and are available from shops (not on NHS). • Cranberry products should not be taken if warfarin is being used. • High strength capsules (containing at least 200 mg of cranberry extract) are recommended because they may be more effective and acceptable than cranberry juice. 	<p>For women in whom episodes of infection are associated with sexual intercourse:^{1B+}</p> <p>Nitrofurantoin 50mg-100mg stat post-coital dose^{1,3} to be taken within 2 hours of intercourse² (off-label use) OR Trimethoprim 100mg stat post-coital dose^{1,2} to be taken within 2 hours of intercourse² (off-label use)</p>	<p>Long-term low dose prophylaxis taken at bedtime:^{1A+}</p> <p>A 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.²</p> <p>Nitrofurantoin 50-100mg at night^{1,3} OR Trimethoprim 100mg at night^{1,3} Alternative – provide patient with specimen pot, request form and delayed prescription according to previous sensitivities</p>
Cautions	<p>Monitor patients on long term nitrofurantoin for signs of pulmonary fibrosis.⁴ Avoid nitrofurantoin if eGFR<60ml/min; risk of peripheral neuropathy; ineffective due to inadequate urine concentrations.⁴</p>		
Evidence	<p>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</p>		
References	<p>1. Management of Infection Guidance for Primary Care, HPA & BIA, Jan 2012 (revised Feb 2013). http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 2. CKS NICE Urinary Tract Infection (lower) – Women – Recurrent cystitis. http://cks.nice.org.uk/urinary-tract-infection-lower-women (Accessed November 2013). 3. European Association of Urology. Guidelines on Urological Infections 2011. http://www.uroweb.org/guidelines/online-guidelines/ 4. BNF 66, September 2013</p>		

Urinary Tract Infections

4.7 Acute Pyelonephritis (Upper UTI)

When to treat	<p>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</p> <p>Admit to hospital people who:²</p> <ul style="list-style-type: none"> • Are significantly dehydrated or who are unable to take oral fluids and medications. • Have signs of sepsis, including: <ul style="list-style-type: none"> ○ A temperature greater than 38°C or less than 36°C, and ○ Marked signs of illness (such as impaired level of consciousness, profuse sweating, rigors, pallor, significantly reduced mobility), or ○ Significant tachycardia, hypotension, or breathlessness. • Are pregnant and pyrexial. • Are frail, elderly residents in care homes who have recently been hospitalised or who have had recurrent UTI. • Fail to improve significantly within 24 hours of starting antibiotics. 	
When to investigate¹	<p>Dipstick test the urine for leucocyte esterase and nitrite for evidence of a UTI.²</p> <ul style="list-style-type: none"> • 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 dipstick tests are negative, a UTI is unlikely (5%). Consider and exclude other causes of loin pain and/or fever including: pelvic inflammatory disease; appendicitis; renal calculi. <p>If hospital admission not needed, send MSU for culture & sensitivities and start antibiotics.^{3C}</p>	
How to respond to a positive lab report	<p>Single organism $\geq 10^4$ colony forming units (CFU)/mL or $\geq 10^5$ mixed growth with one predominant organism or <i>E. coli</i> or <i>Staphylococcus saprophyticus</i> $\geq 10^3$ 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</p>	
Treatment choices	<p>First line^{1,3,4} Co-amoxiclav*C 625mg tds for 7 days</p>	<p>Second line or penicillin allergy^{1,3} Ciprofloxacin*A^c 500mg bd for 7 days^C</p>
Cautions	<p>*High-risk drugs for <i>Clostridium difficile</i> infection but benefits considered to outweigh risks in acute pyelonephritis.³</p> <p>Nitrofurantoin is an ineffective treatment for upper UTI because it does not achieve effective concentrations in the blood.¹</p>	
Evidence	<p>¹ Evidence about the effectiveness of less than two weeks treatment with co-amoxiclav is lacking.¹</p>	
References	<p>1. SIGN UTI 2006 updated July 2012) http://www.sign.ac.uk/guidelines/fulltext/88/index.html (Accessed November 2013)</p> <p>2. CKS NICE Pyelonephritis – acute. http://cks.nice.org.uk/pyelonephritis-acute (Accessed November 2013)</p> <p>3. Management of Infection Guidance for Primary Care, HPA & BIA, Jan 2012 (revised Feb 2013). http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/</p> <p>4. European Association of Urology. Guidelines on Urological Infections 2011. http://www.uroweb.org/guidelines/online-guidelines/</p>	

Urinary Tract Infections

5.1 Genital Tract Infections: Criteria for referring patients to specialist care

Patient risk factors	<p>Refer patents with the following risk factors for STIs to GUM/Sexual Health Services clinic or general practices with level 2 or 3 expertise in GUM/Sexual Health Services: ^{1,2}</p> <ul style="list-style-type: none"> ● <25yrs ● no condom use ● recent (<12mth) or frequent change of sexual partner ● previous STI ● symptomatic partner
Diseases Not Listed Below	<ul style="list-style-type: none"> ● 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	<p>See Health Protection Agency and British Infection Association Quick Reference Guide to Management and Laboratory Diagnosis of Abdominal Vaginal Discharge for useful flowchart.³</p>
	<p>1. RCGP & BASHH Guidance: Sexually Transmitted Infections in Primary Care (revised 2013) http://www.bashh.org/documents/Sexually%20Transmitted%20Infections%20in%20Primary%20Care%202013.pdf (Accessed November 2013)</p> <p>2. National Chlamydia Screening Programme http://www.chlamydia-screening.nhs.uk/ (Accessed November 2013)</p> <p>3. HPA / BIA: Quick Reference Guide for Primary Care management of Abnormal Vaginal Discharge in Women (amended 26.09.11) http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1194947408846</p>

Genital Tract Infections

5.2 Vulvo Vaginal 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 speciated fungal culture of vaginal secretions 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 to non-albicans Candida species' when treatment fails ³ .	
How to respond to a positive laboratory result:	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 .	
General Advice	Routine recommendation of use of vulval moisturisers (such as aqueous cream or Epaderm ointment) 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 Avoid local irritants e.g. perfumed products. ²	
Treatment choices	First line non-pregnant⁵ Clotrimazole^{A+} 10% Vaginal Cream (5g) stat OR Clotrimazole^{A+} 500mg pessary stat at night OR Fluconazole^{A+} 150mg orally stat	First line pregnant⁵ Clotrimazole^{A+} 100 mg pessary at night for 6 nights ^C OR Miconazole 2% cream ^{A+} 5 g intravaginally <i>bd</i> 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	
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. British Association of Sexual Health and HIV 2006. Sexually Transmitted Infections: UK National Screening and Testing Guidelines. http://www.bashh.org/documents/59/59.pdf 2. BASHH 2007. United Kingdom National Guideline on the Management of Vulvovaginal Candidiasis. http://www.bashh.org/documents/1798.pdf 3. CKS NICE Candida female genital. http://cks.nice.org.uk/candida-female-genital (Accessed November 2013). 4. HPA / BIA: Quick Reference Guide for Primary Care management of Abnormal Vaginal Discharge in Women (amended July 2013) http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 5. Management of Infection Guidance for Primary Care, HPA & BIA, February 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/	

Genital Tract Infections

5.3 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. ^{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 : <ul style="list-style-type: none"> • 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 : <ul style="list-style-type: none"> • 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 shower gel, and use of antiseptic agents or shampoo in the bath. ^{1C}	
Treatment choices	First Line: ^{1,2,4} Metronidazole 400mg oral <i>bd</i> for 5-7 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%. ¹ A 7 day course of oral metronidazole is slightly more effective than 2g stat. ^{1A} Topical treatment gives similar cure rates ^{A+} but is more expensive.	
References	<ol style="list-style-type: none"> 1. BASHH: National Guideline For The Management Of Bacterial Vaginosis (2006) http://www.bashh.org/documents/62/62.pdf (Accessed November 2013) 2. CKS NICE Bacterial Vaginosis http://cks.nice.org.uk/bacterial-vaginosis#azTab 3. HPA / BIA: Quick Reference Guide for Primary Care management of Abnormal Vaginal Discharge in Women (revised July 2013) http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1194947408846 4. Management of Infection Guidance for Primary Care, HPA & BIA, revised February 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 5. UK Teratology Information Service. Use of metronidazole in pregnancy. 2008. (Tel: 0844 892 0909) www.toxbase.org (Accessed January 2012) 	

Genital Tract Infections

5.4 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. ^{3,4}	
How to respond to a positive laboratory result:	Treat partners and refer to GUM service. ^{3B+} 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} Azithromycin 1g stat^{A+} OR Doxycycline 100mg <i>bd</i> for 7 days^{A+}	First line: Pregnant or breastfeeding^{1,2,3,5} Azithromycin^{A+} 1g (off-label use) stat OR Erythromycin^{A+} 500mg <i>bd</i> for 14 days⁶ OR Amoxicillin^{A+} 500mg <i>tds</i> for 7 days
Cautions	Refer all pregnant patients to GUM/Sexual Health Services.^{1,2} Pregnancy or breastfeeding: azithromycin is the most effective option. ^{3A+} Due to lower cure rate in pregnancy, test for cure 6 weeks after treatment. ^{3C}	
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 >95% 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. ^{1,2,3}	
References	<ol style="list-style-type: none"> 1. CKS NICE Chlamydia – uncomplicated genital. http://cks.nice.org.uk/chlamydia-uncomplicated-genital (Accessed November 2013). 2. BASHH Management of Chlamydia trachomatis genital tract infection [2006]. http://www.bashh.org/documents/65.pdf 3. Management of Infection Guidance for Primary Care, HPA & BIA, revised February 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 4. British Association of Sexual Health and HIV 2006. Sexually Transmitted Infections: UK National Screening and Testing Guidelines. http://www.bashh.org/documents/59/59.pdf 5. UK Teratology Information Service. The treatment of infections in pregnancy. (Tel: 0844 892 0909) www.toxbase.org (Accessed January 2012) 6. BNF 66, September 2013 	

Genital Tract Infections

5.5 Trichomoniasis

When to treat	Treat only laboratory confirmed diagnosis. ¹ Sexual partner(s) should be treated simultaneously. ² Refer to GUM/Sexual Health Services clinic. 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	
How to respond to a positive laboratory result	Screening for co-existent sexually transmitted infections should be undertaken in both men and women. ²	
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 <i>bd</i> 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 if metronidazole declined (not cure):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 If failure to eradicate <i>T. vaginalis</i> , consider tinidazole and check serum Zinc levels. ⁶	
Evidence	Treating partners does not reduce relapse. ^{5B+} Most strains of <i>T. vaginalis</i> 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. CKS NICE – Trichomoniasis http://cks.nice.org.uk/trichomoniasis (Accessed November 2013) 2. BASHH United Kingdom National Guideline on the Management of Trichomonas vaginalis 2007. http://www.bashh.org/documents/87/87.pdf 3. Management of Infection Guidance for Primary Care, HPA & BIA, Revised February 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 4. BASHH United Kingdom National Screening Guidelines 2006 5. HPA 2011 Management and diagnosis of abnormal vaginal discharge. http://www.hpa.org.uk/webc/hpawebfile/hpaweb_c/1194947408846 6. Johns Hopkins Antibiotic Guide - Trichomonas www.hopkinsguides.com (Accessed February 2012)	

Genital Tract Infections

5.6 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 culture for gonorrhoea & Chlamydia as positive result supports PID diagnosis. ¹ However, a negative result does not exclude PID. ¹	
How to respond to a positive laboratory result	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 BASHH Patient information leaflet: http://www.bashh.org/BASHH/Public_and_Patient_information/Information_on_STIs/Pelvic_inflammatory_disease/BASHH/Public_patient_information/Information_on_STIs/Pelvic_inflammatory_disease.aspx?key=0b9f98a2-b2a5-4385-98a0-a4c2b22985c5	
General advice	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 choices³	If low risk of Gonococcal infection ^{B+} Metronidazole 400mg <i>bd</i> PLUS: [Doxycycline¹ 100mg <i>bd</i> OR *Ofloxacin 400mg <i>bd</i> B⁺] All for 14 days	If high risk of GC ^{B+} (partner has it, severe symptoms, sex abroad) Ceftriaxone* 500mg IM stat ^C (seek expert advice if history of severe penicillin allergy) (PO cefixime 400mg* stat [off-label use] can be used as an alternative ²) PLUS: Metronidazole 400mg PO <i>bd</i> for 14 days PLUS: Doxycycline 100mg <i>bd</i> 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 1 g vial with 3.5 mL of 1% lidocaine injection BP: half (2mL) of the resulting solution provides 500 mg ceftriaxone. It should be given by deep intramuscular injection. ⁴ Metronidazole 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 * High-risk drug for <i>Clostridium difficile</i> infection and should be avoided in at-risk patients.	
Evidence	28% of gonorrhoea isolates resistant to quinolones. ^{3B+}	
References	1. BASHH. UK National Guideline for the Management of Pelvic Inflammatory Disease 2011 http://www.bashh.org/documents/3572.pdf 2. CKS NICE – Pelvic inflammatory disease http://cks.nice.org.uk/pelvic-inflammatory-disease (Accessed November 2013) 3. Management of Infection Guidance for Primary Care, HPA & BIA, Jan 2012. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 4. Electronic Medicines Compendium – Ceftriaxone Wockhardt 1g. www.medicines.org.uk (Accessed November 2013)	

Genital Tract Infections

5.7 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 laboratory 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; ² prostatic abscess may need to be excluded or treated. ¹ Treatment of sexual partners is not required. ³	
General Advice	Adequate hydration should be maintained, rest encouraged and analgesics such as non-steroidal anti-inflammatory drugs if required. ³ 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: ⁴ Ciprofloxacin * 500mg <i>bd</i> for 28 days ^c OR Ofloxacin * 200mg <i>bd</i> for 28 days	Second line or if allergic to quinolones: ⁴ Trimethoprim 200mg <i>bd</i> 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.* High-risk drug for <i>Clostridium difficile</i> infection and should be avoided in at-risk patients.	
Evidence	Quinolones achieve higher prostate levels than trimethoprim. ⁴ UK guidelines recommend treatment for at least 4 weeks to prevent the development of chronic prostatitis. ¹	
References	1 CKS NICE – Acute prostatitis http://cks.nice.org.uk/prostatitis-acute (Accessed November 2013) 2. BASHH Management of Chlamydia trachomatis genital tract infection [2006]. http://www.bashh.org/documents/65.pdf 3. British Association of Sexual Health and HIV 2008 United Kingdom National guideline for the management of prostatitis. http://www.bashh.org/guidelines 4. Management of Infection Guidance for Primary Care, HPA & BIA, Revised February 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/	

Genital Tract Infections

5.8 Balanitis

When to treat¹	When infection is suspected or where symptoms are troublesome or do not resolve with good hygiene.
When to investigate²	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). If penile cancer is suspected, refer urgently to genitourinary medicine (GUM) or urology. If ulceration, urethritis or inguinal lymphadenopathy are 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 laboratory 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 advice²	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 colonization²: Prescribe Clotrimazole 1% or Miconazole 2% cream <i>bd</i> until symptoms settle OR oral Fluconazole 150mg stat.
	If suspected / confirmed Streptococcal balanitis²: Amoxicillin 500mg <i>tds</i> for 7 days OR if penicillin allergic: Clarithromycin 500mg <i>bd</i> for 7 days. If treatment failure: Add Metronidazole 400mg <i>bd</i> for 7 days
	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 <i>Gardnerella</i> infection will prevent reinfection and recurrent balanitis. ²
References	1. British Association of Sexual Health and HIV. http://www.bashh.org/guidelines 2. CKS NICE – Balanitis http://cks.nice.org.uk/balanitis (Accessed November 2013)

Genital Tract Infections

5.9 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. ¹ 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-stream urine for dipstick, microscopy, and culture and test for sexually transmitted infections. ¹ 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 laboratory result	Tailor treatment according to culture and sensitivity results. If the patient was gonorrhoea positive, a test of cure should be performed at least 72 hours after completion of antibiotics. ²	
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: ³ Ceftriaxone* 500mg stat IM PLUS Doxycycline 100mg <i>bd</i> for 10-14 days No intercourse until review. Notify partner.	Most probably due to chlamydia or other non-gonococcal organism (no risk factors for gonorrhoea) consider: ³ Doxycycline 100mg <i>bd</i> for 10-14 days OR Ofloxacin* 200mg <i>bd</i> for 14 days No intercourse until review. Notify partner
	All causes, but patient is allergic to tetracyclines and/or cephalosporins: ² Ofloxacin* 200mg <i>bd</i> for 14 days	If due to an enteric organism (for example, <i>Escherichia coli</i>): ³ Ofloxacin* 200mg <i>bd</i> for 14 days OR Ciprofloxacin* 500mg <i>bd</i> 10 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. ¹ *High-risk drug for Clostridium difficile infection and should be avoided in at-risk patients.	
Evidence	Cefixime* 400mg oral as a single dose may be an alternative to ceftriaxone where IM route is contraindicated or refused. ⁴ Observations in Asia have raised concern over the adequacy of 400mg cefixime for the treatment of genital gonorrhoea. ⁴	
References	1. PRODIGY – Scrotal swellings - management http://cks.nice.org.uk/scrotal-swellings Accessed November 2013 2. British Association of Sexual Health and HIV 2010. United Kingdom national guideline for the management of epididymo-orchitis. http://www.bashh.org/documents/3546.pdf 3. British Association of Sexual Health and HIV 2011. Clinical care pathway for management of epididymo-orchitis http://www.bashh.org/documents/3547.pdf 4. British Association of Sexual Health and HIV 2011. UK National Guideline for the Management of Gonorrhoea in Adults http://www.bashh.org/documents/3920.pdf	

Genital Tract Infections

6.1 Eradication of *Helicobacter pylori*

When to test and treat	<p>The presence of <i>H. pylori</i> should be confirmed before starting eradication therapy.¹ Eradication is beneficial in duodenal ulcer (DU), gastric ulcer (GU) and low grade MALT lymphoma.² Patients with non-ulcer dyspepsia (NUD) testing positive for <i>H. pylori</i> should be offered eradication therapy as it may improve symptoms.³ In chronic NSAID user without ulcer history, HP eradication will reduce the risk of peptic ulcers and/or bleeding but will not remove all risk.⁴ Do not offer eradication for GORD.²</p> <p>Urgently refer patients >55 with new, unexplained and persistent recent-onset dyspepsia for endoscopy.⁴</p>	
When to investigate	<p>Test eligible patients (see above) using a urea breath test, a stool antigen test or lab serology testing.⁵ The urea breath test is preferred in patients who have undergone previous <i>H. pylori</i> eradication therapy.⁵ Stop PPI use 14 days prior to breath or stool testing. Withhold breath/stool testing for 28 days after antibiotic treatment.⁵ DU/GU relapse: retest for <i>H. pylori</i> using breath or stool test OR consider endoscopy for culture & susceptibility.^{2C} NUD relapse: Do not retest, offer PPI or H2RA.² Patients with complicated peptic ulcer or MALT lymphoma should be retested (using breath test) 4 weeks after treatment.⁴ Refer for endoscopy culture and sensitivity testing: Patients who have had metronidazole & clarithromycin for any infection & are allergic to amoxicillin or tetracycline; patients who have received two courses of eradication and still test positive.⁴ Seek microbiology or gastroenterology advice for third line options.⁴</p>	
Treatment choices	Do not use clarithromycin or metronidazole if used in the last year for any infection ²	
	<p>First choice: All for 7 days ^{2A+}</p> <p>PPI bd (use cheapest)</p> <p>PLUS:</p> <p>Clarithromycin 500mg <i>bd</i> and</p> <p>Amoxicillin 1g <i>bd</i></p> <p>OR</p> <p>Clarithromycin 250mg <i>bd</i> and</p> <p>Metronidazole 400mg <i>bd</i></p>	<p>Alternative regimen (Relapse or MALToma): All for 14 days ^{2C}</p> <p>PPI <i>bd</i></p> <p>PLUS:</p> <p>Tripotassium dicitratobismuthate 240mg <i>bd</i></p> <p>PLUS:</p> <p>2 unused antibiotics from the following:</p> <p>Amoxicillin 1g <i>bd</i></p> <p>Metronidazole 400mg <i>tds</i></p> <p>Oxytetracycline 500mg <i>qds</i></p>
Cautions	There is usually no need to continue PPI/H2RA unless large ulcer, haemorrhage or perforation - continue for 3 weeks. ¹	
Evidence	Helicobacter test & treat strategies will benefit patients with ulcer disease, 8% of patients with functional dyspepsia, and reduce future risk of ulcer disease, gastric cancer and risks of long-term PPIs. ⁴ For NUD the NNT is 14 for symptom relief. ^{2A+}	
References	<ol style="list-style-type: none"> BNF 66, September 2013 Management of Infection Guidance for Primary Care, HPA & BIA, Revised February 2013 http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ NICE. Dyspepsia 2005. (Clinical guideline 17) http://guidance.nice.org.uk/CG17/ HPA 2008 Helicobacter pylori Quick reference guide http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ CKS NICE – Proven peptic ulcer http://cks.nice.org.uk/dyspepsia-proven-peptic-ulcer (Accessed November 2013) 	

Gastro-intestinal infections

6.2 Infectious Diarrhoea

When to treat	<p>Definition of acute diarrhoea: 3 or more episodes a day, <14d and sample takes shape of pot.¹</p> <p>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</p> <p>If <i>Campylobacter</i> is strongly suspected early in the course as the cause of diarrhoea (e.g. undercooked meat and abdominal pain), consider empirical treatment with clarithromycin.²</p> <p>Urgently refer all previously healthy children with acute painful, bloody diarrhoea or confirmed <i>E. coli</i> O157.¹</p>
When to investigate	<p>Send a stool specimen for culture and sensitivity if:</p> <ul style="list-style-type: none"> • Systemically unwell; blood or pus in the stool; • if 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 (if under 65 years, also request <i>C. difficile</i>); • diarrhoea is persistent (e.g. >1week).³ <p>If the diarrhoea has stopped, culture is rarely indicated, as recovery of the pathogen is unlikely.¹</p> <p>Consider blood tests if infection and other causes of acute diarrhoea excluded and a chronic cause is suspected.³</p> <p>Consult local HPU if: Suspected public health hazard; outbreaks of diarrhoea in the family or community; infected with certain organisms (e.g. <i>E. coli</i> O157) where there may be serious clinical sequelae to an infection.³</p>
How to respond to a positive laboratory result¹	<p>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.</p> <p><i>Campylobacter</i>: Antibiotic therapy has little effect on duration of symptoms unless given very early in illness course.</p> <p><i>Giardia lamblia</i> and <i>Entamoeba histolytica</i> should be treated according to sensitivity results.</p> <p>Unless symptoms persist, Blastocystis and <i>Dientamoeba fragilis</i> do not usually require treatment if otherwise healthy.</p> <p><i>C. difficile</i>: See <i>C. difficile</i> recommendations.</p>
Treatment choices	<p>Fluid replacement is essential.</p> <p>If systemically unwell and campylobacter suspected consider Clarithromycin 500 mg bd for 5 days if treated early.^{2C}</p>
Evidence	<p>There are no routine methods for detecting enterotoxigenic <i>E. coli</i>, the commonest cause of traveller's diarrhoea.¹</p> <p>Quinolones are not recommended because there is increasing resistance in <i>Campylobacter</i> to quinolones.²</p>
References	<p>1. HPA 2010 Infectious diarrhoea Quick reference guide for primary care http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/</p> <p>2. Management of Infection Guidance for Primary Care, HPA & BIA, February 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/</p> <p>3. CKS NICE – Diarrhoea – adults http://cks.nice.org.uk/diarrhoea-adults-assessment (Accessed November 2013)</p>

Gastro-intestinal infections

6.3 Diverticulitis

When to treat¹	<p>Antibiotic treatment is recommended for the routine management of diverticulitis, either at home or as an inpatient. People with mild, uncomplicated diverticulitis can be managed at home with paracetamol, clear fluids, and antibiotics. Arrange admission for people with diverticulitis when:</p> <ul style="list-style-type: none"> • 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 investigate¹	<p>If symptoms persist after 48 hours despite conservative management at home admit patient to hospital.</p>	
General advice¹	<p>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 reintroduce solid food as symptoms improve over 2–3 days.</p>	
Treatment choices¹	<p>1st choice: Co-amoxiclav* 625mg tablets <i>tds</i> for 5 days</p>	<p>2nd choice or if allergic to co-amoxiclav: Metronidazole 400mg <i>tds</i> for 5 days PLUS Cefalexin* 500mg <i>bd</i> for 5 days</p>
Cautions	<p>*High-risk for <i>C. difficile</i> infection- discuss with a Medical Microbiologist for alternative treatment options. Nonsteroidal anti-inflammatory drugs (NSAIDs) and opioid analgesics have been identified as risk factors for diverticular perforation and are probably best avoided in the management of people with acute diverticulitis.¹</p>	
References	<p>1. CKS NICE – Diverticular disease http://cks.nice.org.uk/diverticular-disease (Accessed November 2013) 2. Jacobs D. Diverticulitis NEJM 2007; 357: 2057-2066</p>	

Gastro-intestinal infections

6.4 Clostridium difficile Infection

When to treat¹	<p>People with mild disease may not require specific <i>C. difficile</i> antibiotic treatment.¹ Treat patients with mild-to-moderate <i>C. difficile</i> infection. If <i>C. difficile</i> positive and the patient has features of severe or life-threatening <i>C. difficile</i> infection, or their condition is rapidly deteriorating, admit to hospital. If the condition has improved considerably or resolved without treatment, consider possibility of false-positive result. Mild: No increased white cell count (WCC) and typically associated with <3 episodes of loose stools/day. Moderate: Increased WCC (but <15 x 10⁹/L) and typically associated with 3–5 loose stools per day. Severe: WCC >15 x 10⁹/L, or an acutely increased serum creatinine concentration (>50% above baseline), or a temperature >38.5°C, or evidence of severe colitis. The number of stools may be a less reliable indicator of severity. Life-threatening: Signs and symptoms include hypotension, partial or complete ileus, or toxic megacolon. Recurrence: please discuss with a Consultant Medical Microbiologist as treatment with Fidaxomicin may be appropriate</p>		
When to investigate¹	<p>Send a stool sample to test for <i>C. difficile</i> toxin if a clinical diagnosis of <i>C. difficile</i> infection is suspected, and the person is symptomatic with liquid/loose stools (with a consistency that takes the shape of the container). Document the following details on the request form: Clinical features, recent antibiotic or proton pump inhibitor, or hospital admission, contact with other affected individuals or outbreak, state whether the test was requested by the HPU or a Consultant in Communicable Disease Control.</p>		
How to respond to a positive lab result	<p>Start treatment. Discontinue therapy with the inciting antibiotic(s) as soon as possible, as this may influence the risk of recurrence.² Stop unnecessary PPIs.^{3B+}</p>		
Treatment choices	<p>General advice¹: Review the person daily and monitor for signs of increasing severity of disease as they may deteriorate very rapidly</p>	<p>First and second episode²: Metronidazole 400mg <i>tds</i> for 10 -14 days^C</p>	<p>Third episode, severe symptoms, or failed response to metronidazole: discuss with medical microbiologist but start Vancomycin oral 125mg <i>qds</i> for 10-14 days^{3C} Metronidazole should not normally be deemed to have failed until at least one week of treatment received⁴</p>
Cautions	<p>If possible, avoid use of antimotility agents as they may obscure symptoms and precipitate toxic megacolon.²</p>		
Evidence	<p>70% respond to metronidazole in 5 days; 92% in 14 days.³ Administration of currently available probiotics is not recommended to prevent primary <i>C. difficile</i>.² The majority of recurrences are due to reinfection rather than relapse and the same antibiotic that had been used initially can be used to treat a first recurrence.⁴</p>		
References	<p>1. CKS NICE – Diverticular disease http://cks.nice.org.uk/diverticular-disease (Accessed November 2013) 2. Cohen S et al. Clinical Practice Guidelines for <i>Clostridium difficile</i> Infection in Adults: 2010 Update by the SHEA and the IDSA. http://www.azdhs.gov/phs/oids/epi/disease/cdif/documents/Cd_ClinicalPracticeGuidelines.pdf 3. Management of Infection Guidance for Primary Care, HPA & BIA, Revised February 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 4. DH C. <i>difficile</i> – How to deal with the problem 2009 http://www.hpa.org.uk/webc/hpawebfile/hpaweb_c/1232006607827</p>		
Gastro-intestinal infections			

6.5 Travellers' Diarrhoea (Stand-by or Prophylactic Treatment)

When to treat	<p>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</p> <p>Prophylactic antibiotics: Consider if the patient is at high risk of diarrhoea <i>and</i>: 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</p> <p>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</p> <p>High-risk countries are defined as most of Asia, the Middle-East, Africa, Mexico, Central and Southern America.²</p>	
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	<p>First line:</p> <p>Advise the use of oral rehydration salt solution for the management and prevention of dehydration (particularly for children and infants).¹</p> <p>Loperamide can be considered for travellers in whom frequent diarrhoea is inconvenient.³</p> <p>Avoid loperamide in children and patients with inflammatory bowel disease, a fever or blood in stool.³</p>	<p>Prophylaxis (see high-risk groups above): Ciprofloxacin* 500mg <i>od</i> (on private Rx) for up to 3 weeks. If contra-indicated seek specialist advice¹</p> <p>Standby: (start if symptoms moderate/severe): Ciprofloxacin* 500mg <i>bd</i> for 3 days (on private Rx)² OR If ciprofloxacin contra-indicated or travelling to Thailand/Far East: Azithromycin 500mg <i>od</i> for 3 days (on private Rx)¹</p>
Evidence	<p>Azithromycin, bismuth salicylate, loperamide and probiotics are not recommended for prophylaxis.¹</p> <p>Antibiotic treatment is associated with shorter duration of diarrhoea but higher incidence of side-effects.⁴</p> <p>The combination of loperamide and an antibiotic in moderate diarrhoea may lead to more rapid improvement compared with either agent alone.³ *High-risk drug for <i>Clostridium difficile</i> infection and should be avoided in at-risk patients.</p>	
References	<p>1. CKS NICE – Diarrhoea – adults http://cks.nice.org.uk/diarrhoea-adults-assessment (Accessed November 2013)</p> <p>2. Management of Infection Guidance for Primary Care, HPA & BIA, February 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/</p> <p>3. Travellers' diarrhoea. HPA 2011 www.nathnac.org (Accessed March 2012)</p> <p>4. De Bruyn G, Hahn S, Borwick A. Antibiotic treatment for travellers' diarrhoea. Cochrane Database of Systematic Reviews 2000, Issue 3. Art. No.: CD002242.</p>	
Gastro-intestinal infections		

6.6 Threadworms

When to treat¹	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 investigate¹	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 advice²	In conjunction with treatment, advise hygiene measures for 2 weeks (hand hygiene, pants at night, morning shower) PLUS wash sleepwear, bed linen, dust, and vacuum on day one. ^C	
Treatment choices	<p>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 persists¹</p>	<p>For children aged 3-6 months:¹ Piperazine and senna sachet: one level 2.5mL spoonful stat repeated after 2 weeks For children aged under 3 months:² 6 weeks strict hygiene to prevent faecal-oral re-infection^C</p>
Cautions¹	Treatment with an anthelmintic is contraindicated in children less than 3 months and women in the first trimester of pregnancy. Women in the second or third trimester and women who are breastfeeding may prefer not to take an anthelmintic and use hygiene methods.	
Evidence¹	Neither mebendazole nor piperazine kills eggs, therefore adequate personal and environmental hygiene is essential to prevent reinfestation from recently swallowed eggs, or eggs already in the environment. It is generally accepted that mebendazole and piperazine have comparable efficacy (90–100% cure-rate), however mebendazole has few contraindications and post-marketing surveillance has revealed no serious safety concerns.	
References	1. CKS NICE – Threadworms http://cks.nice.org.uk/threadworm (Accessed November 2013) 2. Management of Infection Guidance for Primary Care, HPA & BIA, Jan 2012. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/	

Gastro-intestinal infections

Other worms

Refer to BNF or seek microbiology advice

Giardiasis

Treatment choices	Metronidazole 2g OD for 3 days (not in pregnancy) or Metronidazole 400mg TDS for 5 days
--------------------------	--

Gastro-intestinal infections

7.1 Impetigo

When to treat	<p>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.¹ Topical antibiotics should be reserved for very localised lesions and oral antibiotics used for extensive, severe or bullous impetigo.²</p> <p>Non-bullous impetigo is the most common form. Lesions begin as vesicles or pustules, which rapidly burst and evolve into gold-cruusted plaques. The area around the mouth and nose is most commonly affected.¹</p> <p>Bullous impetigo, which commonly affects neonates, 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, neck folds, and nappy area. Lesions are usually painful, are often multiple and spread rapidly.¹</p>			
When to investigate:	<p>Skin swabs are not necessary to diagnose impetigo.¹</p> <p>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.¹</p> <p>Advise the person to attend a follow-up appointment if there is no significant improvement after 7 days.¹</p>			
How to respond to a positive laboratory result	<p>Review any culture results and ensure that an appropriate antibiotic is being used.</p>			
General advice	<p>Advise that hygiene measures are important to aid healing and stop the infection spreading to other sites on the body and to other people.¹</p>			
Treatment choices²	<p>Small localised infections: Fusidic Acid 2% topically tds for 5 days</p>	<p>More generalised infections: Flucloxacillin 250- 500mg qds for 7 days</p>	<p>Second line or if penicillin allergic: Clarithromycin 250-500mg bd for 7 days</p>	<p>Small localised infections due to MRSA: Mupirocin 2% topically tds to affected area(s) for 5 days If more generalised, discuss with Medical Microbiologist</p>
Evidence	<p>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.² If a topical antibiotic is used, a short course (such as 5 days) reduces exposure and the risk of resistance.²</p> <p>There is good evidence that topical fusidic acid and topical mupirocin are at least as effective as oral treatment.³</p>			
References	<p>1. CKS NICE – Impetigo http://cks.nice.org.uk/impetigo (Accessed November 2013)</p> <p>2. Management of Infection Guidance for Primary Care, HPA & BIA, revised February 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/</p> <p>3. Koning S et al. Interventions for impetigo. Cochrane Database of Systematic Reviews 2012, Issue 1. Art. No.: CD003261. DOI: 10.1002/14651858.CD003261.pub3</p>			

Skin & Soft Tissue Infections

7.2 Eczema

When to treat

If **no visible signs of infection**, use of antibiotics (alone or with steroids) encourages resistance and does not improve healing.^{1,2 B}

Oral antibiotics were not associated with benefit in small trials of eczema without visible signs of infection.^{1,2,3}

However, heavy colonisation of the skin with *S. aureus* has been reported in people with atopic eczema even when the skin is not clinically infected, and this may contribute to continuing disease activity.⁴

In eczema with **visible signs of infection**, use treatment as in impetigo.^{1C}

If there are localised areas of infection a topical antibiotic in combination with steroid can be considered for no longer than two weeks. In more generalised infected eczema, use treatment as in impetigo^C (i.e. 1st line flucloxacillin)^{2,3,4}

Refer immediately (same day) to hospital if eczema herpeticum is suspected³.

Signs of eczema herpeticum are^{3,4}:

- areas of rapidly worsening, painful eczema;
- clustered blisters consistent with early-stage cold sores;
- punched-out erosions (circular, depressed, ulcerated lesions) usually 1–3 mm in diameter that are uniform in appearance (these may coalesce to form larger areas of erosion with crusting);
- possible fever, lethargy, or distress.

Refer urgently (within 2 weeks) to a dermatologist if infected eczema has not responded to treatment^{3,4}

References

1. Management of Infection Guidance for Primary Care, HPA & BIA, Jan 2012 <http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/>
2. Bath-Hextall FJ et al 2010. Interventions to reduce *Staphylococcus aureus* in the management of atopic eczema: an updated Cochrane review. *British Journal of Dermatology* 2010 163, pp12–26
3. CKS NICE – Atopic eczema <http://cks.nice.org.uk/eczema-atopic> (Accessed November 2013)
4. NICE CG57: Atopic eczema in children. 2007. (Clinical guideline 57) <http://guidance.nice.org.uk/CG57/>

Skin & Soft Tissue Infections

7.3 Cellulitis

When to treat	Antibiotics should be started without delay as soon as culture specimens (if indicated) have been obtained. ¹ Cellulitis presents with an acute onset of red, painful, hot, swollen, and tender skin, with possible blister formation. ² Fever, malaise, nausea, shivering and rigors may also occur. ² Differential diagnoses include DVT and varicose eczema. ²		
When to investigate:	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. ² 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. ² Discuss with microbiologist if there has been exposure to river, sea water or spa bath. ³ If patient is known MRSA positive and not responding to treatment, please discuss with medical microbiologist.		
How to respond to a positive laboratory 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. ²		
General advice	Before treatment, draw around the extent of the infection with a permanent marker pen for future comparison. ² Elevation of the affected area speeds improvement by promoting gravity drainage of the oedema/inflammatory substances. ⁴		
Treatment choices³	First Line: Flucloxacillin 500mg qds for 7 days ^C	If penicillin allergic: Clarithromycin 500mg bd for 7 days OR Clindamycin* 300-450mg qds ^C	Mild facial cellulitis: Co-amoxiclav* 625mg tds for 7 days ^C
	If slow response continue antibiotics for a further 7 days.		
Cautions	*High-risk drug for <i>Clostridium difficile</i> infection and should be avoided in at-risk patients. Stop clindamycin if diarrhoea occurs. ³		
Evidence	Topical antibiotics should not be prescribed. ⁵ Swabbing unbroken skin for culture in cases of cellulitis infrequently yields a pathogen. ¹		
References	<ol style="list-style-type: none"> 1. Eron L, Lipinsky B, Low D, Nathwani D, Tice A, Volturo G. Managing skin and soft tissue infections: expert panel recommendations in key decision points JAC 2003; 52: 3-17. 2. CKS NICE - Cellulitis http://cks.nice.org.uk/cellulitis-acute (Accessed November 2013) 3. Management of Infection Guidance for Primary Care, HPA & BIA, Jan 2012. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 4. Infectious Diseases Society of America 2005. Practice Guidelines for the Diagnosis and Management of Skin and Soft-Tissue Infections 5. BNF 66, September 2013 		

Skin & Soft Tissue Infections

7.4 Leg Ulcers

When to treat	<p>Signs of an infected leg ulcer include enlarging ulcer, increased exudate, increased pain, pyrexia, foul odour or cellulitis.^{1,2,3} See Sign - Management of Chronic Venous Leg Ulcers (120) for full guidance. http://www.sign.ac.uk/pdf/sign120.pdf</p> <p>Leg ulcers are always colonised and antibiotics will only promote healing during active infection.⁴</p> <p>If the patient has an active infection, start empirical antibiotics after taking a wound swab for cultures and sensitivity.⁴</p> <p>Potassium permanganate soaks are helpful for malodorous ulcers because they have antiseptic and astringent properties.¹</p>	
When to investigate:	<p>Arterial or mixed venous/arterial ulcer: refer people to a specialist tissue viability or leg ulcer nurse for further assessment.²</p> <p>Take a swab for all infected venous leg ulcers before prescribing an antibiotic.¹</p> <p>Leg ulcers should not routinely be swabbed unless there is clinical evidence of infection.⁴</p> <p>Use a swab with transport medium and charcoal, to aid survival of fastidious organisms.⁵ Ideally, clean the ulcer with tap water or saline first, and remove unhealthy tissue. Then place the swab onto viable tissue displaying signs of infection and rotate gently to pick up any loose material.¹</p>	
How to respond to a positive laboratory result	<p>Review antibiotics after culture results.⁴ Seek microbiology advice if colonised with MRSA.⁵</p> <p>Swab results determine organisms present and antimicrobial susceptibilities, they do not determine the presence of infection. Group A β-haemolytic streptococci can be associated with significant infection and delay healing. Significance of other organisms depends on presence of the clinical criteria above.⁵ Inclusion of antibiotic susceptibilities in microbiology report does not necessarily mean an organism is significant or that it requires antibiotic treatment.⁵</p>	
General advice	<p>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 The use of topical antibiotics in the management of infected wounds should generally be avoided to minimise the risk of allergy and the emergence of bacterial resistance.^{1,3} The use of a topical antiseptic, for example an iodine-based product, may be used as an adjunct to systemic treatment.^{2,6}</p>	
Treatment choices⁴	<p>First-line if evidence of active infection</p> <p>Flucloxacillin 500mg <i>qds</i> for 7 days. If slow response continue for a further 7 days^C</p>	<p>If penicillin allergic:</p> <p>Clarithromycin 500mg <i>bd</i> for 7 days. If slow response continue for a further 7 days^C</p>
Evidence	<p>There is insufficient evidence to show that any wound dressing (including dressings impregnated with silver) is better than simple low-adherent dressings for the healing of venous leg ulcers.¹ (Seek advice from tissue viability specialist.)</p>	
References	<ol style="list-style-type: none"> 1. CKE NICE – Venous Leg Ulcer http://cks.nice.org.uk/leg-ulcer-venous (Accessed November 2013) 2. Southern Health Leg Ulcer Guidelines April 2009. 3. World Union of Wound Healing Societies (WUWHS). Principles of best practice: Wound infection in clinical practice. An international consensus. London: MEP Ltd, 2008. Available from www.woundsinternational.com/pdf/content_31.pdf). 4. Management of Infection Guidance for Primary Care, HPA & BIA, revised February 2013. 5. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 6. O'Meara S, Al-Khurdi D, Ovington LG. Antibiotics and antiseptics for venous leg ulcers. Cochrane Database of Systematic Reviews. 2010. Issue 1. http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD003557/frame.html 	

Skin & Soft Tissue Infections

7.5 Diabetic Foot Ulcer

When to treat	<ul style="list-style-type: none"> •Antibiotics should not be used for foot ulcers without signs of infection as they do not enhance healing or prevent infection.¹ •The clinical diagnosis of foot infection is based on the presence of purulent discharge from an ulcer or signs of inflammation (i.e. erythema, pain, tenderness, warmth or induration).² Other signs include foul odour, tissue necrosis and failure of wound healing despite optimal management.¹ •Ideally refer anyone with new diabetic foot infection to a multidisciplinary foot-care team within 24 hours.³ If this is not possible and the infection is superficial and non-limb-threatening, consider taking swabs then starting empirical antibiotic treatment.³ Mild infections are those where there is the presence of pus and/or two or more signs of inflammation, but any cellulitis or erythema extends ≤ 2 cm around the ulcer, infection is limited to the skin or superficial subcutaneous tissues and there are no other local complications or systemic illness.¹ •If the infection is severe, refer for urgent inpatient management.³ 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; systemic symptoms of infection; lack of response of infection to oral antibiotics; suspicion of bone involvement or deep seated infection; immunocompromised patients or those with poor diabetic control.^{3,4} 		
When to investigate	Swabs should be taken from the deepest part of the cleaned wound after removal of surface contamination and exudate. ³ Ensure that the person is reviewed within 48 hours. ³		
How to respond to a positive laboratory 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. ¹ Clinical failure of appropriate antibiotics may be due to patient nonadherence, antibiotic resistance, superinfection, undetected abscess or 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. ⁵ Advise them to seek urgent medical attention if their symptoms or general condition become worse. ³ Elevation of the affected area speeds improvement by promoting gravity drainage of the oedema/inflammatory substances. ²		
Treatment choices	First Line: Flucloxacillin 500mg <i>qds</i> for 7 days <i>If penicillin allergic: Clarithromycin</i> 500mg <i>bd</i> for 7days	If known to be colonised with MRSA: ⁶ Doxycycline 100mg <i>bd</i> for 7 days	Second line: Co-amoxiclav 625mg <i>tds</i> 7 days and refer to MDT foot-care team
	Consider adding Metronidazole 400mg <i>tds</i> to cover anaerobes (e.g. if foul odour). ⁴		
Evidence	Consider continuing antibiotics for a further 7 days depending on severity of infection and speed of response to treatment. 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	<ol style="list-style-type: none"> 1. Bader M. Diabetic Foot Infection. American Family Physician 2008; 78(1): 71-79. 2. Infectious Diseases Society of America 2005. Practice Guidelines for the Diagnosis and Management of Skin and Soft-Tissue Infections 3. CKS NICE – Diabetes - Type 2 http://cks.nice.org.uk/diabetes-type-2 (Accessed November 2013) 4. NICE. Inpatient management of diabetic foot problems 2011. (Clinical guideline 119) http://www.nice.org.uk/CG119 (Accessed February 2012) 5. NICE. Type 2 diabetes foot problems; Prevention and management of foot problems 2004. (Clinical Guideline 10) http://www.nice.org.uk/CG10 6. Management of Infection Guidance for Primary Care, HPA & BIA, revised February 2013 http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 		

Skin & Soft Tissue Infections

7.7 Animal Bite

When to treat	<p>Prescribe prophylactic antibiotics if the wound is less than 48 hours old, at high infection risk and does not require referral to secondary care.¹ High infection risk: cat bites, bites to the hand, foot or face; people aged 50 or over; puncture wounds; wounds requiring surgical debridement; wounds involving joints, tendons, ligaments or suspected fracture; wounds that have undergone primary closure; people at risk of serious wound infection (e.g. diabetic, cirrhotic, immunosuppressed, asplenic); people with a prosthetic valve or joint.¹ Antibiotics are not usually needed if the wound is more than 48 hours old and there is no sign of local or systemic infection.¹ The following require secondary care referral: Penetrating wounds involving arteries, joints, nerves, muscles, tendons, bones, the CNS; facial wounds (unless very minor); systemic illness; possibility of foreign body presence; wounds requiring closure; bites that might need reconstructive surgery; devitalized wounds requiring debridement; bites where the severity is difficult to assess; bites with severe cellulitis; infections not responding to treatment; people with an increased risk of infection (see above); children with scalp wounds; bites to poorly vascularised areas.¹ Bite wounds suitable for management in primary care do not usually require closure.¹ Assess risk of tetanus and rabies.² If any risk of rabies contact the PHE 0844 225 3861</p>	
When to investigate:	<p>Where infection suspected, send a pus or deep wound swab (state animal bite on request form) for culture before cleaning the wound and starting antibiotics.¹ Advise all patients to attend urgently for review if the infection worsens or if they feel increasingly unwell.¹ For infected wounds, review at 24 and 48 hours.¹</p>	
How to respond to a positive laboratory result	<p>Alter treatment in response to culture and sensitivity results. For animals not covered in this guidance, seek microbiology advice for the most appropriate antibiotic.¹</p>	
General advice	<p>If the wound has just occurred, encourage it to bleed. Clean and irrigate the wound.¹</p>	
Treatment choices	<p>Cat or Dog bite first line prophylaxis or treatment:² Co-amoxiclav* 375-625 mg <i>tds</i> for 7 days</p>	<p>Cat or Dog bite prophylaxis or treatment if penicillin allergic:² Metronidazole 200-400mg <i>tds</i> PLUS Doxycycline 100mg <i>bd</i> for 7 days For children under 12 with penicillin allergy seek microbiology advice.¹</p>
Cautions	<p>*High-risk drug for <i>Clostridium difficile</i> infection and should be avoided in at-risk patients Antiseptic cleansers are not necessary, and there is some concern that they damage tissue and delay wound healing.¹</p>	
Evidence	<p>Non-human bites that are low risk and that do not involve the hand have infection rates <2%.³ Macrolides are not recommended for animal bites because they do not adequately cover <i>Pasteurella</i>.²</p>	
References	<p>1. CKS NICE – Bites – human and animal http://cks.nice.org.uk/bites-human-and-animal (Accessed November 2013) 2. Management of Infection Guidance for Primary Care, HPA & BIA, Feb 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 3. US Surgical Infection Society Guidelines 2009 Treatment of Complicated Skin and Soft Tissue Infections. Surgical Infections 10(5); 467-499</p>	

Skin & Soft Tissue Infections

7.8 Human Bite

When to treat	<p>Human bites can result in serious soft tissue infection.¹ Prescribe prophylactic antibiotics for all human bite wounds under 72 hours old, even if there is no sign of infection.² If a bite is >72 hours old and there is no sign that it has become infected, the risk of infection is likely to be low and prophylactic antibiotics are probably not of value.²</p> <p>The following require secondary care referral: Penetrating wounds involving arteries, joints, nerves, muscles, tendons, bones, the CNS; facial wounds (unless very minor); systemic illness; possibility of foreign body presence; wounds requiring closure; bites that might need reconstructive surgery; devitalised wounds requiring debridement; bites where the severity is difficult to assess; bites with severe cellulitis; infections not responding to treatment; people with an increased risk of infection (e.g. diabetic, cirrhotic, immunosuppressed, asplenic); bites to poorly vascularised areas.²</p> <p>Bite wounds suitable for management in primary care do not usually require closure.²</p>	
When to investigate:	<p>Where infection suspected, send a pus or deep wound swab for culture before cleaning the wound and starting antibiotics.² Advise all patients to attend urgently for review if the infection worsens or if they feel increasingly unwell. For infected wounds, review at 24 and 48 hours.²</p> <p>Seek immediate advice from a consultant in microbiology or infectious diseases for anyone considered to be at risk of HIV, hepatitis B or C.² Consider all people to be at risk unless the current status of the biter is known (rare).²</p> <p>Consider if tetanus prophylaxis is required. Tetanus after a human bite is extremely rare.²</p>	
How to respond to a positive laboratory result	Alter treatment in response to culture and sensitivity results.	
General advice	If the wound has just occurred, encourage it to bleed. Clean and irrigate the wound thoroughly with warm running water. ²	
Treatment choices	<p>Prophylaxis or treatment:³</p> <p>Co-amoxiclav* 375-625 mg <i>tds</i> for 7 days^B</p>	<p>If penicillin allergic:³</p> <p>Metronidazole 200-400mg <i>tds</i> PLUS Doxycycline 100mg <i>bd</i> for 7 days^C</p> <p>OR Clarithromycin 250-500mg <i>bd</i> for 7 days^C</p>
Cautions	<p>*High-risk drug for <i>Clostridium difficile</i> infection and should be avoided in at-risk patients</p> <p>Antiseptic cleansers are not necessary and there is some concern that they damage tissue and delay wound healing.²</p>	
Evidence	Doxycycline, but not clarithromycin is active against Eikenella species, which is commonly isolated from human mouths. ³	
References	<p>1. Dryden M. Complicated skin and soft tissue infection. <i>Journal of Antimicrobial Chemotherapy</i>. 2010; 65(3): 35-44</p> <p>2. CKS NICE – Bites – human and animal http://cks.nice.org.uk/bites-human-and-animal (Accessed November 2013)</p> <p>3. Management of Infection Guidance for Primary Care, HPA & BIA, Feb 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/</p>	

Skin & Soft Tissue Infections

7.9 Scabies

When to treat	<p>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</p> <p>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 Scabies persists indefinitely if not treated.¹</p> <p>Treat scabies that has become infected with an antibiotic.¹</p>	
When to investigate	<p>Finding the mite or its products confirms, but is not necessary for making a diagnosis of scabies.¹</p> <p>Review if symptoms have not cleared within 6 weeks after the first application of treatment.¹</p> <p>Refer institutionalised outbreaks of scabies (e.g. schools, long-stay nursing homes) to the HPA.¹</p>	
Treatment choices	<p>Permethrin^{AT} 5% cream. Apply as described below, in two applications, 7 days apart.³ Wash off after 8-12 hours.¹</p>	<p>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</p>
	<p>Apply the treatment to the whole body from the chin and ears downwards paying special attention to the areas between the fingers and toes and under the nails. People who are immunosuppressed, the very young (under 2) and elderly people should apply the insecticide to the whole body including the face and scalp.¹ If treatment is washed off during the treatment period (e.g. hand washing), it should be reapplied.¹</p>	
General advice	<p>Itch may persist for several weeks.¹</p> <p>Machine wash (at 50°C or above) clothes, towels, and bed linen, on the day of application of the first treatment.¹</p> <p>If recurrence occurs where all contacts were treated simultaneously and treatment was applied correctly, give a course of a different insecticide.¹</p>	
Evidence	<p>There is more evidence for the effectiveness of permethrin than malathion.¹</p> <p>Benzyl benzoate is regarded as too irritant, and crotamiton is ineffective compared to the recommended options.²</p> <p>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</p>	
References	<ol style="list-style-type: none"> 1. CKS NICE - Scabies http://cks.nice.org.uk/scabies (Accessed November 2013) 2. British Association of Sexual Health and HIV 2013 United Kingdom National Guideline on the Management of Scabies infestation. http://www.bashh.org/guidelines 3. Management of Infection Guidance for Primary Care, HPA & BIA, Feb 2012. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 	

Skin & Soft Tissue Infections

7.10 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. 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 laboratory 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 <i>Candida</i> sp, 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	<p>Dermatophyte infection Skin or foot.² Topical 1% Terbinafine ^{A+} <i>od - bd</i> for 7-14 days ^{A+} Groin or foot.² Use a 1% Clotrimazole cream <i>od - bd</i> for 4-6 weeks Alternative for foot only.³ Topical Undecanoates (Mycota®) ^{B+} <i>bd</i> continued for 1-2 weeks after healing</p>	<p>Candida infection Clotrimazole cream 1% <i>od - bd</i> continued for 1-2 weeks after healing¹</p>	<p>If intractable, send skin scrapings before starting oral treatment:³ Terbinafine 250mg oral <i>od</i>⁴ Skin: 4 weeks Groin: 2-4 weeks Foot: 2-6 weeks⁴ OR Itraconazole⁴⁺ Skin or groin: either 100 mg oral daily for 15 days, or 200 mg <i>od</i> for 7 days⁴ Foot: either 100mg oral once daily for 30 days or 200mg <i>twice daily</i> for 7 days⁴</p>
Cautions	*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		
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. CKS NICE – Fungal skin infection: Body and groin http://cks.nice.org.uk/fungal-skin-infection-body-and-groin-management (Accessed November 2013) 2. HPA Fungal skin and nail infections 2011. http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1240294785726 (Accessed March 2012) 3. Management of Infection Guidance for Primary Care, HPA & BIA, Feb 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 4. BNF 66, September 2013.		

Skin & Soft Tissue Infections

7.11 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 laboratory result	For infections with dermatophytes use oral terbinafine or itraconazole. ⁴ Terbinafine is more effective than azoles. ^{4A+} If candida or non-dermatophyte infection confirmed, use oral itraconazole. ^{4B+}		
General advice	Liver reactions rare with oral antifungals. ^{4A+} For children, seek specialist advice as fungal nail infection is rare in children, and the preferred treatments are not licensed for use in children. ^{4c}		
Treatment choices⁴	Superficial only: Amorolfine 5% nail lacquer ^{B-} 1-2x / weekly Fingernails: 6 months Toenails: 12 months	First line: Terbinafine ^{A+} 250mg oral <i>od</i> Fingernails: 6-12 weeks Toenails: 3-6 months	Second line: Itraconazole ^{A+} 200mg oral <i>bd</i> for 7 days each month. Fingernails: 2 courses Toenails: 3 courses
Evidence	Treatment does not always cure the infection. ³ Cure rates range between approximately 60–80%. ³ The HPA 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. HPA Fungal skin and nail infections 2011. http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1240294785726 Accessed Jan 2012 2. Roberts DT, Taylor WD, Boyle J. Guidelines for treatment of onychomycosis. British Journal of Dermatology 2003;148:402-410 3. CKS NICE - Fungal Nail Infection http://cks.nice.org.uk/fungal-nail-infection Accessed November 2013 4. Management of Infection Guidance for Primary Care, HPA & BIA, Feb 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/		

Skin & Soft Tissue Infections

7.12 Varicella Zoster (chicken pox), Herpes Zoster (shingles) & Cold Sores

When to treat	<p>For chicken pox and shingles: Pregnant/immunocompromised/neonate: Seek urgent specialist advice.^{1B+} Chicken pox: If started <24h of rash onset & >14 years old or severe pain, dense/oral rash, 2^o household case, steroids or smoker consider treatment.¹ 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 <72 h of rash onset and >50 years old or if non-truncal involvement or moderate/severe pain or rash. Treat and/or urgently refer patients with ophthalmic involvement. Immunocompetent children: antivirals not recommended.² Cold sore: Resolve after 7–10d without treatment. Topical antivirals applied prodromally reduce duration by 12-24hrs.¹</p>	
When to test	<p>Chicken pox: Laboratory tests can be used for confirmation but are rarely required.³ 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.²</p>	
General advice	<p>Prescribe appropriate analgesia where necessary.^{2,3}</p>	
Treatment choices	<p>First line chicken pox/shingles: Aciclovir^{A+} 800 mg five times a day 7 days^{1B+} Cold sore: Topical aciclovir 5% 4-hourly for 5-10 days⁴</p>	<p>Second line for shingles if compliance a problem (more expensive)¹ Valaciclovir^{B+} 1g tds 7 days^{B+} OR Famciclovir^{B+} 500mg tds 7 days^{B+}</p>
Evidence ¹	<p>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 congenital varicella syndrome if exposure occurs during the first 20 weeks of pregnancy, and severe disease in the neonate if varicella is contracted a week before delivery.</p>	
References	<p>1. Management of Infection Guidance for Primary Care, HPA & BIA, Feb 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 2. CKS NICE – Shingles http://cks.nice.org.uk/shingles (Accessed November 2013) 3. CKS NICE – Chickenpox http://cks.nice.org.uk/chickenpox (Accessed November 2013) 4. BNF 63, March 2012</p>	

Skin & Soft Tissue Infections

7.13 Acne vulgaris

When to treat	For patients seeking treatment, topical or systemic therapy should be commenced early to prevent scarring, ¹ although scarring is unlikely in mild disease. ²		
When to investigate²	Refer to dermatology: people with severe acne; features that make the diagnosis uncertain; those who are at risk of developing scarring despite treatment; people who have moderate acne that has failed to respond adequately to treatment (over a period of at least 6 months); those with painful, deep, nodules or cysts. People who have severe psychosocial problems, including a morbid fear of deformity or people who have suicidal ideation, should be referred promptly to psychiatry. Refer to endocrinology or gynaecology, women suspected of having an underlying endocrinological cause of acne (such as PCOS) that needs assessment.		
General advice²	In general, it is recommended that people with acne: do not wash more than twice a day, use a mild soap or cleanser and lukewarm water, do not use vigorous scrubbing when washing acne-affected skin, do not attempt to 'clean' blackheads. Advise patients that 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	First line mild/moderate ² : Benzoyl Peroxide gel, washes or creams (2.5%, 5%, 10%) Available OTC or on prescription	First line moderate/severe (awaiting referral) and scarring likely: Isotretinoin (+/- erythromycin) 0.05% gel: od or bd as directed OR Oxytetracycline 500mg <i>bd</i> ^{1,2} OR Doxycycline 50mg-100mg <i>od</i> ^{1,2}	Second line moderate/severe ^{1,2} : Erythromycin 500mg <i>bd</i>
	Consider prescribing a standard combined oral contraceptive or co-cyprindiol (Dianette) for women who require contraception. ²		
Evidence	There is good evidence from placebo-controlled trials that tetracycline is effective at reducing lesion counts and severity. ² There is a lack of evidence from placebo-controlled trials to verify the efficacy of erythromycin, although evidence from comparative trials indicate it is probably as effective as tetracyclines. Oral erythromycin should be reserved for use when tetracyclines are contraindicated. 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. ³		
References	1. BNF 66, September 2013 2. CKS NICE – Acne vulgaris http://cks.nice.org.uk/acne-vulgaris , Accessed February 2013 3. What role for topical antibacterials in acne? Drug and Therapeutics Bulletin 2010 ; 48 : 141-144		

Skin & Soft Tissue Infections

8.1 Infective Conjunctivitis

When to treat	<p>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</p> <p>Infective conjunctivitis may be viral or bacterial – it is difficult to clinically distinguish between the two.¹</p> <p>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</p> <p>Consider offering a topical antibiotic if the conjunctivitis is severe.²</p> <p>Clinical resolution occurs within 2-5 days in 65% of confirmed bacterial conjunctivitis cases treated with placebo.¹</p>	
When to investigate	<p>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</p> <p>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</p> <p>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</p>	
Treatment choices³	<p>First line:</p> <p>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.</p>	<p>Second line:</p> <p>Fusidic acid 1% viscous eye drops <i>bd</i>^{B-} Continue for 48h after symptom resolution</p>
General advice	<p>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</p>	
Evidence	<p>Fusidic acid has less Gram-negative activity than chloramphenicol.³</p> <p>A double-blind placebo-controlled RCT in children showed, at day 7, 83% clinical cure with placebo compared with 86% with chloramphenicol.⁴</p> <p>Delayed prescribing of antibiotics appears to reduce antibiotic use (almost 50%) with similar symptom control to immediate prescribing.⁵</p>	
References	<ol style="list-style-type: none"> 1. Management of acute infective conjunctivitis. Drug and Therapeutics Bulletin 2011; 49(7): 78-80 2. CKS NICE http://cks.nice.org.uk/conjunctivitis-infective (Accessed November 2013) 3. Management of Infection Guidance for Primary Care, HPA & BIA, Jan 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 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

9.1 Mucosal Ulceration and Inflammation (Simple Gingivitis)

When to treat¹	Where possible manage precipitating factors. Offer symptomatic treatment for pain, discomfort, and swelling, especially when ulcers are causing problems with eating. If ulcers are infrequent, mild, and not interfering with daily activities (for example eating), treatment may not be needed.		
When to refer¹	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. Unexplained red and white patches (including suspected lichen planus) of the mucosa that are painful, swollen, or bleeding. Symptoms or signs related to the oral cavity that persist for >6 weeks if a definitive diagnosis of a benign lesion cannot be made. 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. A suspected underlying cause of aphthous-like ulceration, suggested by history, examination, or results of investigations Particularly painful and disabling aphthous ulceration or if recurrences are frequent and severe and not adequately relieved by symptomatic treatments.		
General advice	Temporary pain and swelling relief can be attained with saline mouthwash. ³ Use antiseptic mouthwash if more severe pain limits oral hygiene or to prevent secondary infection. ¹		
Treatment choices³	Simple saline mouthwash ½ tsp salt dissolved in glass warm water	Chlorhexidine 0.2% mouthwash (Do not use within 30mins of toothpaste) Rinse mouth with 10mL for 1 minute <i>bd</i> . Can be diluted 1:1 with water with no loss in efficacy.	Hydrogen peroxide mouthwash 6% Rinse mouth for 2-3 minutes with 15 ml diluted in half a glass of warm water <i>tds</i> .
	Spit out mouthwash after rinsing. Use until lesions have resolved or less pain allows oral hygiene. ³		
Evidence¹	Evidence on antimicrobial mouthwashes for the management of aphthous ulcers is poor. The quality of studies is poor and results are not consistent. 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. However, antimicrobial mouthwashes do not seem to reduce the incidence of ulceration (number of new ulcers).		
References	<ol style="list-style-type: none"> 1. CKS NICE – Aphthous ulcer http://cks.nice.org.uk/aphthous-ulcer (Accessed November 2013) 2. BNF 66, September 2013 3. Scottish Dental Clinical Effectiveness Programme Drug Prescribing For Dentistry 2011 http://www.sdcep.org.uk (Accessed March 2012) 		

Dental Infections

9.2 Acute Necrotising Ulcerative Gingivitis (ANG) and Pericoronitis (PC)

When to treat	<p>Professional scaling and polishing, root surface instrumentation, and sometimes surgical procedures, are required.¹ ANG: The mainstay of treatment is local antiseptics and hygiene measures; adjunctive antibiotics are only required in cases of systemic involvement or where there is failure to improve following primary dental management.^{1,2} Commence antibiotics and refer urgently to dentist for scaling and oral hygiene advice.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.^{2,3}</p>	
General advice²	<p>During the acute phase the person should, if possible, use a soft toothbrush to clean their teeth.¹ While the patient is waiting for referral to a dentist prescribe analgesia for pain relief.¹</p>	
Treatment choices	<p>First line^{2,3}: Metronidazole 400mg <i>tds</i> for 3 days in conjunction with dental treatment.</p>	<p>Second line^{2,3}: Amoxicillin 500mg <i>tds</i> for 3 days in conjunction with dental treatment (irrigation or incision and debridement). In adults, the dose can be doubled in severe infections²</p>
Evidence	<p>Trials or systematic reviews on the treatment of ANUG are awaited; therefore the recommendations are based on formal expert opinion from the Scottish Dental Clinical Effectiveness Programme 2011.</p> <p>Obligate anaerobes were isolated in 91% of cases, in a study of 35 patients with pericoronitis, and resistance to metronidazole was not evident in any species. Amoxicillin was highly active against 91.5% of aerobes and anaerobes isolated and therefore in severe infections amoxicillin can be added to metronidazole.⁴ PRODIGY found no evidence that metronidazole is more (or less) effective than amoxicillin.¹</p>	
References	<p>1. CKS NICE – Gingivitis and periodontitis http://cks.nice.org.uk/gingivitis-and-periodontitis (Accessed November 2013) 2. Scottish Dental Clinical Effectiveness Programme Drug Prescribing For Dentistry 2011 http://www.sdcep.org.uk (Accessed March 2012) 3. BNF 66, September 2013 4. Management of Infection Guidance for Primary Care, HPA & BIA Feb 2013 http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/</p>	

Dental Infections

9.3 Dental Abscess

When to treat	<p>Systemic signs of acute dental abscess include: pyrexia, trismus, lymphadenopathy, gross facial or ocular oedema, dysphagia, tachycardia or rigors. Refer urgently to dentist - dental abscesses should be treated with local measures in the first instance.¹ Interim treatment while waiting to see a dental practitioner may consist of advice about self-care and analgesia, with or without an antibiotic prescription.²</p> <p>Antibiotics are only recommended (in conjunction with urgent dental referral) if there are signs of severe infection, with cellulitis or systemic symptoms or high risk of complications.^{2,3} Otherwise, regular analgesia should be first option until a dentist can be seen.⁴ Definitive surgical treatment to drain the abscess (through incision, extraction or removal of necrotic pulp) by a dentist is the primary management of a dentoalveolar abscess.⁴</p>	
General advice²	<p>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.</p> <p>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. Advise the patient that antibiotic therapy is prescribed to reduce the spread of infection; <i>not</i> a substitute for dental treatment.</p>	
Treatment choices	<p>First line:^{2,4} Amoxicillin 500mg – 1g <i>tds</i> for 5 days If spreading infection (lymph node involvement, or systemic signs i.e. fever or malaise) ADD metronidazole.^{4C}</p>	<p>Penicillin Allergy or as an adjunct to amoxicillin where there is spreading infection or pyrexia.^{1,2} Metronidazole 400mg <i>tds</i> for 5 days</p>
Cautions	<p>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</p>	
Evidence	<p>Amoxicillin and metronidazole are generally considered to be the antibiotics of choice for the management of dental abscesses. PRODIGY found very little evidence to provide clear advice on which of the two antibiotics should be considered first-line.²</p> <p>An audit in Cardiff of 112 patients with dentoalveolar infection concluded that incisional drainage appeared to produce a more rapid improvement compared to drainage by opening of the root canal. The presence of penicillin-resistant bacteria did not adversely affect the outcome of treatment. The observations made support surgical drainage as the first principle of management and question the value of prescribing penicillin as part of treatment.⁴</p> <p>The empirical use of clindamycin, clarithromycin, cephalosporins and co-amoxiclav 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.^{4C}</p>	
References	<ol style="list-style-type: none"> 1. Scottish Dental Clinical Effectiveness Programme Drug Prescribing For Dentistry 2011 http://www.sdcep.org.uk (Accessed March 2012) 2. CKS NICE – Dental abscess http://cks.nice.org.uk/dental-abscess (Accessed November 2013) 3. BNF 66, September 2013. 4. Management of Infection Guidance for Primary Care, HPA & BIA Feb 2013. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/PrimaryCareGuidance/ 	

Dental Infections