# Southampton, Hampshire, Isle of Wight & Portsmouth along with Surrey Heath, Berkshire East and Berkshire West Guidelines for **Antibiotic Prescribing** in the Community **2014**

NHS
North Hampshire
Clinical Commissioning Group

Adapted from the Public Health England (PHE) and British Infection Association Management of Infection Guidance for Primary Care by the Wessex Pharmacists Antibacterial Group

# Foreword

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

The multi-disciplinary guideline development group consisted of general practitioners, hospital consultant medical microbiologists, a consultant in HIV / genito-urinary medicine, podiatry, specialist hospital microbiology / infectious diseases pharmacists, primary care trust, hospital trust, community trust and ambulance trust pharmacists (see below).

The guidelines have been updated from the previous version, published in 2012, taking into consideration feedback from users, emerging evidence and changing epidemiology of antimicrobial resistance. The guidelines are based largely on the Management of Infection Guidance for Primary Care, published jointly by the Health Protection Agency and the British Infection Association, updated in February 2013, and the guideline development group gratefully acknowledges the work of Dr Cliodna 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 has also been expanded from the PHE/BIA Guidance including information about risk of *Clostridium difficile* infection. All statements are fully referenced.

This updated version of the guidelines has been developed in 2014 and the next update will be scheduled for review in November 2016.

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

**Reference**

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

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## Aims

- to provide a simple, empirical approach to the treatment of common infections
- 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. 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.
3. Lower threshold for antibiotics in immunocompromised or those with multiple morbidities; consider culture and seek advice.
4. Prescribe an antibiotic only when there is likely to be a clear clinical benefit.
5. Consider a no, or delayed, antibiotic strategy for acute self-limiting upper respiratory tract infections.[A+]
6. Limit prescribing over the telephone to exceptional cases.
7. 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.
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 (2g). 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. The syrup formulation of clarithromycin is only slightly more expensive than erythromycin and could also be considered for children.
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 *Clostridium difficile* infection | Risk of antibiotic treatment failure |
|---|---|---|
| **Patient** | Older patients (over 65yr) & antibiotic exposure within previous 2 months | History of infection with resistant microorganism. Recent antibiotic exposure. Immunocompromised. |
| **Environment** | Contact with patients with *Clostridium difficile* or recent hospital admission | Infection acquired in healthcare environment |
| **Action** | Withhold antibiotics if safe to do so (watchful waiting). Avoid high risk antibiotics (the 4 Cs):<br>• Cephalosporins<br>• Ciprofloxacin & quinolones<br>• Co-amoxiclav<br>• Clindamycin<br>(indicated by an asterisk in the following tables) | Consider second-line antibiotics from the following tables |

## Evidence Grading

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

# General Practice Sepsis Screening and Action Tool (from THE UK SEPSIS TRUST)

Sepsis is a time critical condition. Screening, early intervention and immediate treatment saves lives. This tool should be applied to all adult patients who are not pregnant who have a suspected infection or their clinical observations are outside of normal limit.

**Patient groups to consider screening: those in whom you are considering antibiotic prescription or stewardship discussion, patients with "Flu", patients with gastroenteritis and the unwell patient without clear cause.**

**1. Might this be more than a self-limiting infection?**
- Symptoms of infection *(e.g. a recent history of fever)*
- Acute deterioration
- Unexplained illness, especially in immunosuppressed or elderly people

N → **Sepsis is unlikely.** Continue usual care.

Y ↓

**2. Perform a full set of observations. Are any 2 of the following present?**
- Temperature > 38.3ºC or < 36ºC
- Respiratory rate > 20 per minute
- Heart rate > 90 per minute
- Acute confusion, disorientation, reduced conscious level
- Consider blood glucose: > 7.7 relevant in non-diabetics

N → **Sepsis may be present**

Evaluate whether acute referral / admission required, especially if:
- already on antibiotics
- partially treated
- no clear source of infection

If treating in the community, consider:
- planned second assessment
- brief written handover documenting observations
- specific safety net advice

Y ↓

**3. Is any red flag present?**
- Systolic B.P < 90 mmHg
- Heart rate > 130 per minute
- Respiratory rate > 25 per minute
- Oxygen saturations < 91% *(may be appropriate to accept SpO2 < 91% in patients with known COPD)*
- Responds only to voice or pain/ unresponsive
- Purpuric rash

N → **Sepsis may be present** (as above)

Y → **Red Flag Sepsis**

**This is a time critical condition, immediate action is required.**
- Dial 999
- Arrange blue light transfer
- Write a brief clear handover including
- observations and antibiotic allergies where present.
- Administer oxygen and other appropriate immediate care as available

# Index


**1. Ear Nose and Throat Conditions**

1.1 Acute Sore Throat & Fever Pain 13/14
1.2 Acute Otitis Media 15
1.3 Acute Otitis Externa 16
1.4 Acute Rhinosinusitis 17

**2. Respiratory Tract Infections**

2.1 Acute Cough, Bronchitis 19
2.2 Influenza 20
2.3 COPD Acute Exacerbation 21
2.4 Community-Acquired Pneumonia 22

**3. Central Nervous System**

3.1 Meningitis or Suspected Meningococcal Disease 23

**4. Urinary Tract Infections**

4.1 Uncomplicated UTI in Women 25
4.2 Lower UTI in Pregnancy 26
4.3 Lower UTI in Men 27
4.4 Catheter-associated UTI 28
4.5 UTI in Children 29
4.6 Recurrent UTI in Women – Prophylaxis 30
4.7 Acute Pyelonephritis (Upper UTI) 31

**5. Genital Tract Infections**

5.1 Criteria for referring patients to specialist care 33
5.2 Vulvo Vaginal Candidiasis 34
5.3 Bacterial Vaginosis 35
5.4 *Chlamydia Trachomatis* 36
5.5 Trichomoniasis 37
5.6 Pelvic Inflammatory Disease 38
5.7 Acute Prostatitis 39
5.8 Balanitis 40
5.9 Epididymo-Orchitis 41

**6. Gastro-intestinal Infections**

6.1 Eradication of *Helicobacter pylori* 43/44
6.2 Infectious Diarrhoea 45
6.3 Diverticulitis 46
6.4 *Clostridium difficile* Infection 47/48
6.5 Travellers' Diarrhoea 49
6.6 Threadworms 50

**7. Skin & Soft tissue Infections**

7.1 Impetigo 51
7.2 Eczema 52
7.3 Cellulitis 53
7.4 Leg ulcers 54
7.5 Diabetic foot ulcer 55
7.6 MRSA 56
7.7 Animal Bite 57
7.8 Human Bite 58
7.9 Scabies 59
7.10 Fungal infection – skin 60
7.11 Fungal infection – fingernail or toenail 61
7.12 Varicella Zoster (chicken pox), Herpes Zoster (shingles) & Cold Sores 62
7.13 Acne vulgaris 63
7.14 Surgical Site Infections 64
7.15 Scarlet Fever (Scarletina) 65

**8. Eye Infections**

8.1 Infective Conjunctivitis 67

**9. Dental Infections**

9.1. Mucosal Ulceration and Inflammation (Simple Gingivitis) 69
9.2 Acute Necrotising Ulcerative Gingivitis (ANG) and Pericoronitis (PC) 70
9.3 Dental Abscess 71

**10. IV/IM Drugs in the Community**

IV/IM Ceftriaxone 73

**11. Fosfomycin Information** 75

# **Ear Nose** and **Throat** Conditions

EN&T

## Ear Nose and Throat Infections – Acute Sore Throat

| | | |
|---|---|---|
| **When to treat**[1] | Avoid antibiotics as 90% resolve in 7 days without, and pain only reduced by 16 hours.[1A+]<br>See attached sore throat clinical scoring system **(FeverPain)**<br>If Fever Score 0 or 1: **do not offer antibiotics**<br>If Fever score 2 or 3: **consider 2 or 3-day delayed antibiotics**.[1A+]<br>If Fever Score 4 or more: **offer immediate antibiotics**<br>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+] | |
| **When to investigate**[3] | Throat swabs or rapid antigen tests should not be carried out routinely in the investigation of acute sore throat.[2,3] Suspect glandular fever in a person with a sore throat that fails to improve, or becomes worse, after several days.[3] | |
| **Treatment choices**[1] | **First line:**<br>**Phenoxymethylpenicillin**[B] 500mg *qds* ***OR*** 1g *bd*[A+] for 10 days[A-]<br>(1g *qds* when severe[D]) | ***If allergic to penicillin:***<br>**Clarithromycin** 250-500mg *bd* for 5 days[A+] |
| **Cautions**[3] | Prescribing amoxicillin or ampicillin will produce a generalized, itchy maculopapular rash in over 90% of people with glandular fever.[3] | |
| **Evidence** | • 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 Clostridium difficile associated disease; and is associated with more adverse drug reactions. 5-days clarithromycin should be reserved for those with true penicillin allergy.[1]<br>• 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]<br>• 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** | 1. Management of Infection Guidance for Primary Care, PHE & BIA, Jan 2012. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Accessed September 2014<br>2. NICE. National Institute for Health and Clinical Excellence. Prescribing of antibiotics for self-limiting respiratory tract infections in adults and children in primary care. 2008. (Clinical guideline 69) **http://guidance.nice.org.uk/CG69**<br>3. NICE CKS Sore Throat – Acute **http://cks.nice.org.uk/sore-throat-acute#azTab** (Accessed July 14) | |

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

**Inclusion criteria:** patients aged 3 years and over presenting to English primary care clinicians with an acute (<2 weeks) sore throat.

Note: average total length of illness is 1 week.

**FeverPAIN** – one point each for:

- Fever during the last 24 hours
- Pus on tonsils
- Attend rapidly (short prior illness duration of 3 days or less)
- Inflamed (severely) tonsils
- No cough or coryza ('runny nose')

**Suggested actions:**

- **Score 0-1:** do not offer antibiotics (<20% streptococci Lancefield Groups A, C, G)[a]
- **Score 2-3:** delayed prescription[b] (39% streptococci)
- **Score 4 or more:** offer immediate antibiotics (63% streptococci)

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

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

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

**Reference List**


(1) Little P, Hobbs FD, Moore M, Mant D, Williamson I, McNulty C et al. Clinical score and rapid antigen detection test to guide antibiotic use for sore throats: randomised controlled trial of PRISM (primary care streptococcal management). BMJ 2013; 347:f5806.

(2) Little P, Moore M, Hobbs FD, Mant D, McNulty C, Williamson I et al. PRImary care Streptococcal Management (PRISM) study: identifying clinical variables associated with Lancefield group A beta-haemolytic streptococci and Lancefield non-Group A streptococcal throat infections from two cohorts of patients presenting with an acute sore throat. BMJ Open 2013; 3(10):e003943.

(3) Little P, Stuart B, Hobbs FD, Butler CC, Hay AD, Delaney B et al. Antibiotic prescription strategies for acute sore throat: a prospective observational cohort study. Lancet Infect Dis 2014; 14(3):213-219.

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

### When to treat[1]

**Optimise analgesia and target antibiotics.**[1B-]
AOM resolves in 60% within 24h without antibiotics, which only reduce pain at 2 days (NNT15) and do not prevent deafness.[1A+]
Consider 2 or 3-day delayed antibiotic prescription.[1A+] Consider offering immediate antibiotics for pain relief if:

- **<2 years** AND bilateral AOM (NNT4) or bulging membrane & ≥ 4 marked symptoms [1A+]
- **All ages** with otorrhoea (discharge in the ear canal) NNT3 [1A+]

Antibiotics to prevent mastoiditis NNT >4000 [1B-]

### When to investigate

Routine follow up is not required in the absence of persistent symptoms.[2]

### General advice

Average total length of illness is 4 days.[3]
Use **either** paracetamol **or** ibuprofen in children with fever who appear distressed.[4] Continue only as long as distress is apparent.[4]

### Treatment choices (child doses)[1,4]

**First-line: Amoxicillin**[A+]
13.5mg/kg *tds* (max 500mg *tds*)[B-] for 5 days[A+]
5-10kg: 62.5mg tds
10-19kg: 125mg tds
20-39kg: 250mg tds
≥40 kg: 500mg tds

***If allergic to penicillin:* Clarithromycin**[D] for 5 days[A+]

Under 8kg: 7.5mg/kg *bd*
8-11kg: 62.5mg *bd*
12-19kg: 125mg *bd*
20-29kg: 187.5mg *bd*
≥30kg: 250mg *bd*
12-18 years: 250mg *bd*

### Cautions

**Admission or immediate referral if:** suspected acute complications of (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.[2]
**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]
**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]

### Evidence

Amoxicillin is as effective as other antibiotics in the treatment of AOM in RCTs.[1]
Macrolides concentrate intracellularly and so are less active than penicillin against the extracellular H influenzae.[D]
No advantage in using an antibiotic to cover beta-lactamase resistant organisms (e.g. co-amoxiclav) in the initial treatment of AOM. This should be reserved for persistent acute otitis media.[2]

### References


1. Management of Infection Guidance for Primary Care, PHE & BIA, Jan 2012 **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**
2. NICE Clinical Knowledge Summary, Otitis media – acute. **http://cks.nice.org.uk/otitis-media-acute#azTab** Accessed April 2014
3. NICE Clinical guideline 69, July 2008. Prescribing of antibiotics for self-limiting respiratory tract infections in adults and children in primary care.
4. NICE Clinical Guideline 160, May 2013. Feverish illness in children.
5. BNF for children, May 2014

## Ear Nose and Throat Infections – Acute Otitis Externa

| | | | | |
|---|---|---|---|---|
| **When to treat**[1] | • Assess whether diffuse inflammation or localized i.e. furuncle or boil.<br>• Mild diffuse otitis often responds to acetic acid spray, and keeping water out of the ear.<br>• If more severe or persistent, use a topical antibiotic with or without corticosteroid.<br>• Aural toilet or a wick may be required for the drops to be effective, which may mean referral.<br>• Localized otitis externa may respond to analgesia and application of a warm flannel, but consider oral antibiotics where there is reduced immunity eg diabetes, signs of spreading cellulitis, or if the patient is unwell. | | | |
| **When to investigate**[2] | If the treatment strategy fails, consider taking an ear swab for bacterial and fungal microscopy and culture.<br>A swab is best taken from the medial aspect of the ear canal to reduce contamination. | | | |
| **How to respond to a positive lab report**[2] | Reported bacterial susceptibility may not correlate with clinical outcomes because sensitivities are determined for systemic (not topical) administration. Also, higher concentrations of antibiotic can be achieved with topical application.<br>It is not possible to tell from the culture results whether the isolated organisms are causing the disease or are merely contaminants and there is also likely to be a fungal overgrowth after using antibacterial drops. | | | |
| **Treatment choices**[1] | **First-line: ear drops / spray**<br>**Acetic acid** (EarCalm spray®)<br>2% one spray *tds* for 7 days.[1,2] | **Second-line: ear drops / spray**<br>**Neomycin + steroid** three drops *tds* for 7-14 days.[1,2 A+] | **Oral antibiotics are rarely indicated**[2] | |
| | | | **Flucloxacillin** 500mg *qds* for 7 days[2] | **If allergic to penicillin:**<br>**Clarithromycin** 500mg *bd* for 7 days |
| **Cautions** | Adverse effects to consider include aminoglycoside-induced ototoxicity in people with a perforated tympanic membrane, aminoglycoside-induced skin sensitization, and fungal superinfection (particularly with longer treatments). | | | |
| **Evidence** | Acetic acid was as effective and comparable to antibiotic/steroid for the first 7 days, but inferior after this point.[1] It is important to instruct patients to use drops for at least one week, and to continue for up to 14 days if symptoms persist. The oral antibiotics in the trials were often inactive against *P. aeruginosa* (incidence 36%) and *S. aureus* (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] | | | |
| **References** | 1. Management of Infection Guidance for Primary Care, PHE & BIA, Jan 2012<br>**https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** (Accessed September 2014)<br>2. NICE CKS Otitis Externa **http://cks.nice.org.uk/otitis-externa** (Accessed April 2014) | | | |

## Ear Nose and Throat Infections – Acute Rhinosinusitis

**When to treat**

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 prescription[3] only if it is not appropriate to admit the person and they are:

- Systemically unwell, or at high risk of complications because of a pre-existing comorbidity.
- Recommending measures to relieve symptoms, such as analgesia for pain or fever, an intranasal decongestant, irrigation of the nose with normal saline solution, application of warm face packs, drinking adequate fluids, and rest.

**When to investigate**

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

**Treatment choices[1]**

**First-line: Amoxicillin**[1A+] 500mg (1g if severe[1D]) *tds* for 7 days[1A+] ***OR***
**Doxycycline**[1] 200mg stat then 100mg *od* for 7 days (200mg daily for severe infections[4]).
**Some hospital specialists may prescribe high-dose doxycycline 200mg *bd* for 2 days then 200mg *od* for 4 days.[D]**

***If allergic to penicillin:***
**Doxycycline**[1] 200mg stat, 100mg *od* for 7 days[1A+] (200mg daily for severe infections[4]).

**Second line:**
**In persistent infection use an agent with anti-anaerobic activity such as Co-amoxiclav[1]* 625mg *tds* for 7 days[1A+]**

**Cautions[3]**

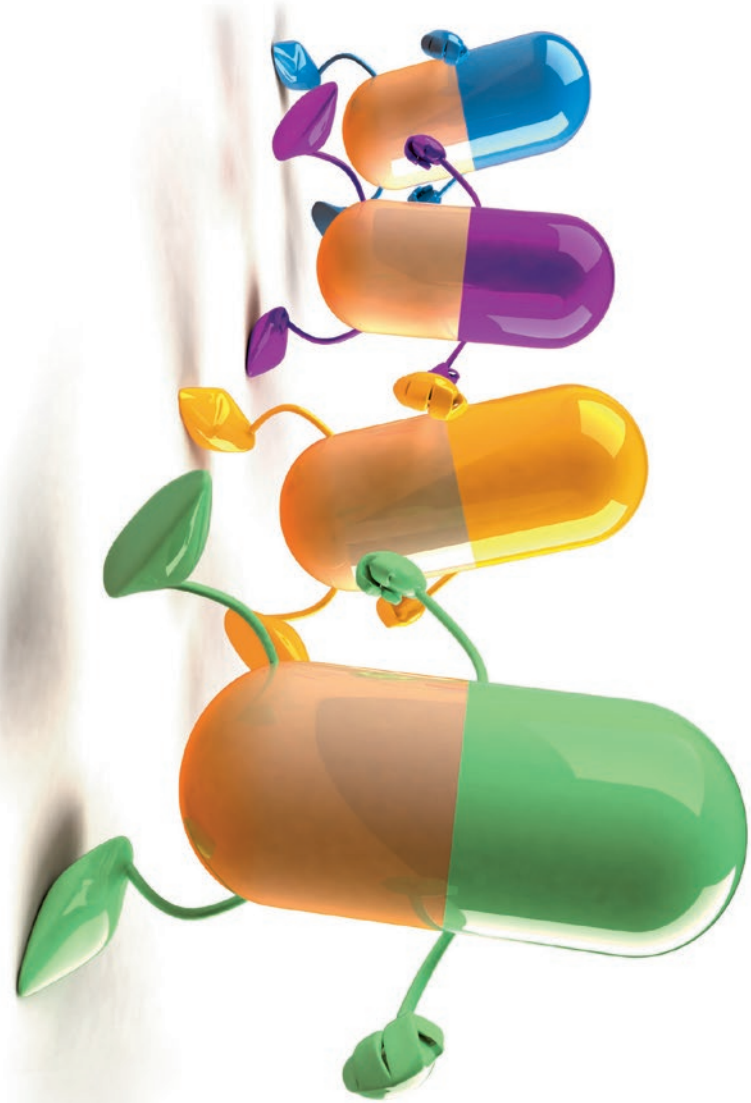
Admit to hospital if there is severe systemic infection, or if a complication of sinusitis is suspected.[3] Suspect intra-orbital involvement if there is peri-orbital oedema, a displaced globe, double vision, ophthalmoplegia, or reduced visual acuity. Suspect intracranial involvement if there is a severe 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 Clostridium difficile infection and should be avoided in at-risk patients

**Evidence**

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

**References**


1. Management of Infection Guidance for Primary Care, PHE & BIA, Feb 2013. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infection**s Accessed September 2014
2. NICE. 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/guidance/CG69/chapter/1-Guidance** Reviewed January 2012.
3. NICE CKS Sinusitis **http://cks.nice.org.uk/sinusitis#azTab** (Last revised October 2013)
4. BNF 66. March 2014
5. British Society for Antimicrobial Chemotherapy Resistance Surveillance Project **http://www.bsacsurv.org/reports/respiratory**.



# Respiratory Tract Infections

RTI

## Respiratory Tract Infections – Acute Cough, Bronchitis

**When to treat**

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 pneumonia.[1]
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 infections.[4]
Studies show antibiotics reduce symptoms of cough and feeling ill by less than one day in an illness lasting several weeks in total.[2] 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 immediately.[1] 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 occurs.[3]

**When to investigate**

Routine follow-up is unnecessary.[1] Re-examine people who have deteriorated to exclude pneumonia.[1]

**Treatment choices[1]**

**First-line:** **Amoxicillin** 500mg *tds* for 5 days ***OR***
**Doxycycline** 200mg stat then 100 mg *od* for 5 days total[2]

**Second line** *(if Amoxicillin or Doxycycline unsuitable)*
Consider ***Clarithromycin*** 500mg *bd* for 5 days[1]

**General advice**

Patients should be advised to use paracetamol or ibuprofen as required, drink plenty of fluids and to stop smoking.[1] Advise patients that resolution of symptoms can take up to 3 weeks.[2] Acute cough resolves in 90% of children by 25 days.[5]

**Evidence**

A Cochrane Review of antibiotics for acute bronchitis included 17 trials with 3936 participants and reported no difference in participants described as being clinically improved between antibiotic and placebo groups at follow-up. Antibiotics were associated with a half-day shorter mean cough duration. A recent large European multicenter placebo controlled trial of amoxicillin for acute uncomplicated lower RTI, found that antibiotics did not meaningfully alter important outcomes; either symptom severity or duration of more severe symptoms. The development of new or worsening symptoms was, however, significantly different between groups, but the NNT was high (30) and was roughly equivalent to the number needed to harm.[7]
Cough medicines are not recommended, although they are unlikely to do harm. Some people may find simple remedies like honey and lemon soothing.[1]
Clarithromycin is active against most pathogens involved in acute bronchitis, although resistance is increasing, especially in H. influenzae.[1]
Low doses of penicillins are more likely to select out resistance.[2] Do not use quinolones (ciprofloxacin, ofloxacin) first line due to poor pneumococcal activity. Reserve all quinolones (including levofloxacin) for proven resistant organisms.[2]

**References**


1. CKS.NICE.org.uk/ **http://cks.nice.org.uk/cough#azTab** (Accessed August 2014, topic last revised September 2010)
2. Management of Infection Guidance for Primary Care, PHE & BIA, Jan 2012. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Accessed September 2014
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5. Thompson M1, Vodicka TA, Blair PS, Buckley DI, Heneghan C, Hay AD; TARGET Programme Team. Duration of symptoms of respiratory tract infections in children: systematic review. BMJ. 2013 Dec 11;347.
6. Smith SM, Fahey T, Smucny J, Becker L. Antibiotics for acute bronchitis. Cochrane Database Syst Rev 2014; (4): CD000245 **http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD000245.pub2/otherversions**
7. Little P, Stuart B, Moore M et al. Amoxicillin for acute lower-respiratory-tract infection in primary care when pneumonia is not suspected: a 12-country randomized, placebo-controlled trial. Lancet Infect Dis 2013; 13(2): 123-129.

## Respiratory Tract Infections – Influenza

**When to treat**

Influenza is characterised by the sudden onset of fever, chills, headache, myalgia and extreme fatigue.
In healthy individuals, seasonal influenza is an unpleasant but usually self-limiting disease with recovery in 2–7 days.[1]
**Vaccination:** Annual vaccination (ideally between September and early November) is essential for all those at risk of influenza.[1,2]
At-risk groups (not exhaustive – exercise clinical judgement): ≥65 years old or child aged 2-4; chronic heart disease (not uncomplicated hypertension); chronic respiratory, kidney, liver or neurological disease; diabetes; pregnant women (and up to 2 weeks post-partum); immunocompromised individuals[1]; 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.), household contacts of immunocompromised individuals and principal carers of dependent individuals.[4]
**Treatment:** For otherwise healthy adults (unless pregnant), antivirals are not recommended unless they are at serious risk of complications.[4]
At risk: Pregnancy (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]
If flu is circulating in the community and a patient in an at-risk group can start treatment within 48h of onset of flu-like illness (or of close-contact exposure), oseltamivir or zanamivir is recommended.[4] Administration commencing beyond 48 hours is an off-label use.

**When to investigate**

Routine follow up in otherwise healthy patients is not necessary, but advise the person they should:

- Return if no improvement after 1 week or they are deteriorating;
- seek urgent medical attention if they develop shortness of breath, pleuritic chest pain or haemoptysis;
- Return if they have a low threshold for seeking help if they are caring for a young child or baby with influenza, as children cannot accurately communicate their symptoms.[3]

In at-risk groups, consider follow up (particularly in frail people) after 1 week to confirm improvement and to exclude complications.[3]

**Treatment choices[1]**

| **First line:**[4] | **Severely immunocompromised patients ≥ 5yr or where oseltamivir resistance suspected:**[4] |
|---|---|
| **Oseltamivir** 75 mg *bd* for 5 days. | **Zanamivir** 10 mg (2 inhalations by diskhaler) *bd* for 5 days. |

(**Post-exposure prophylactic regimens:** The above agents are given ONCE daily for 10 days).
For detailed advice on paediatric dosing, consult product literature or latest PHE guidance.[4]

**Evidence**

After immunisation, antibody levels may take up to 10 to 14 days to reach protective levels.[1]

**References**


1. Department of Health Green Book Immunisation against infectious disease. Influenza. **www.dh.gov.uk** Last updated August 2014 (Accessed Aug 2014)
2. Management of Infection Guidance for Primary Care, PHE & BIA, review Nov 2012 (Accessed Jul 2014).
   **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/329175/Managing_infections_guidance_for_primary_care.pdf**
3. NICE CKS Influenza-Seasonal (October 2013 **http://cks.nice.org.uk/influenza-seasonal#!topicsummary** (Accessed August 2014)
4. PHE guidance on antiviral agents for the treatment and prophylaxis of influenza Accessed October 2014)
   **https://www.gov.uk/government/collections/seasonal-influenza-guidance-data-and-analysis**

## Respiratory Tract Infections – 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+]<br>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]<br>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[1]** | **Amoxicillin**[1] 500mg *tds* for 5 days[C]<br>***OR if allergic to penicillin:***<br>**Doxycycline**[1] 200mg stat then 100-200mg *od* for 5 days[C,5].<br>Some hospital specialists may prescribe high-dose doxycycline 200mg *bd* for 2 days then 200mg *od* for 4 days.[D]<br>***OR if allergic to penicillin & tetracyclines contra-indicated:***<br>**Clarithromycin[1]** 500mg *bd* for 5 days[A] | **If resistance risk factors:**<br>**Co-amoxiclav**[1] 625mg *tds* for 5 days[A]<br>Risk factors for antibiotic resistant organisms include co-morbid disease, severe COPD, frequent exacerbations, antibiotics in last 3 months.[1] |
| **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** | 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 for proven resistant organisms.[1] | |
| **References** | 1. Management of Infection Guidance for Primary Care, PHE & BIA, Nov 2012. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Accessed September 2014<br>2. GOLD guidelines for COPD. December 2014 update. **http://www.goldcopd.org/**<br>3. NICE. Chronic obstructive pulmonary disease (updated). 2010. (Clinical Guideline 101) **http://guidance.nice.org.uk/CG101**<br>4. CKS NICE Chronic obstructive pulmonary disease. **http://cks.nice.org.uk/chronic-obstructive-pulmonary-disease** (Accessed Aug 2014)<br>5. BNF 66 March 2014 | |

## Respiratory Tract Infections – Community-Acquired Pneumonia (CAP)

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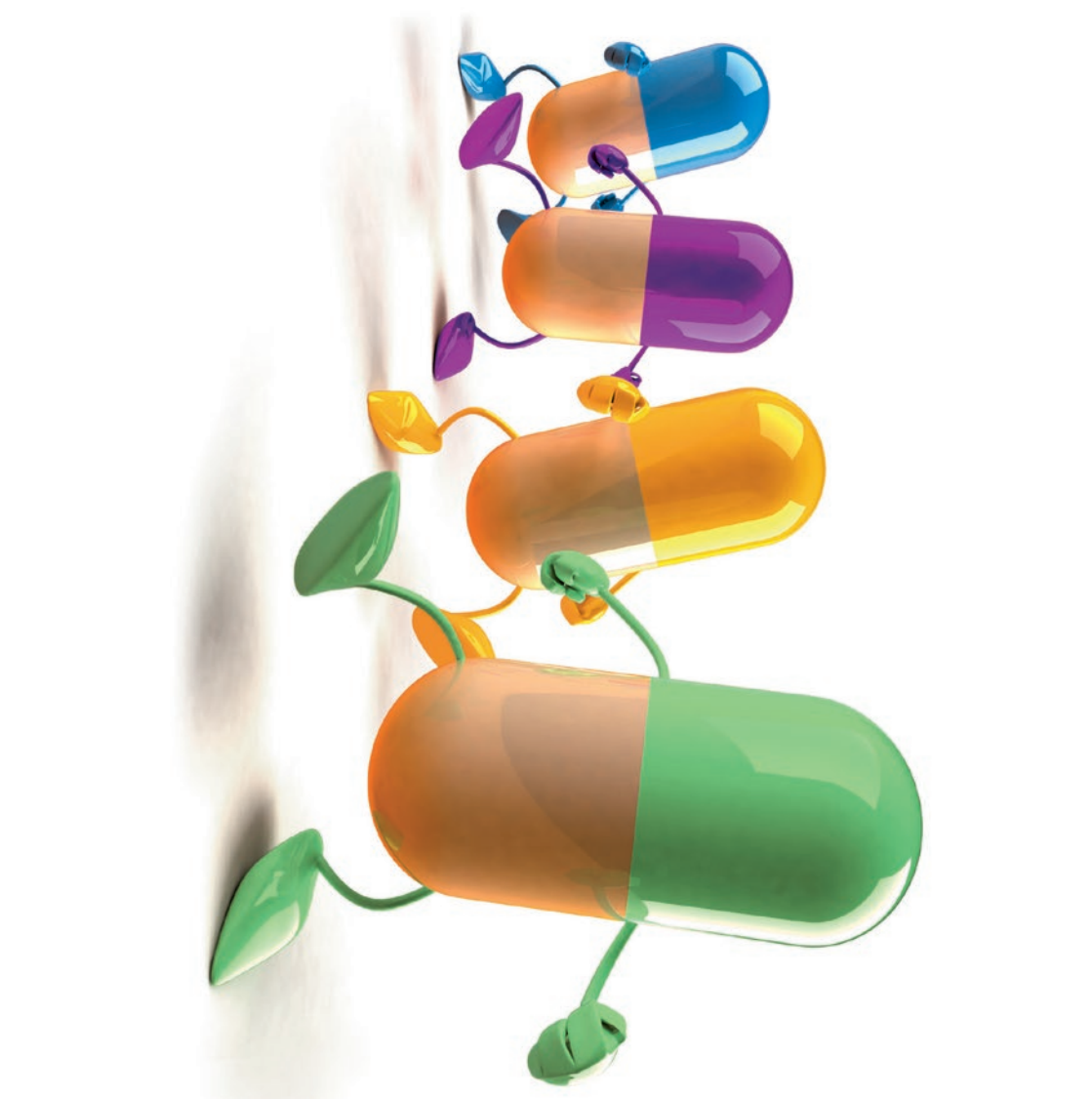
|---|---|---|
| **When to treat** | The presence of either abnormal vital signs (fever >38°C, tachycardia >100/min and tachypnoea >20/min) or an abnormal physical examination of the chest (crackles, decreased breath sounds, dullness to percussion, wheeze) identified patients with radiographically confirmed 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]:<br>**Each scores 1:**<br>• Confusion (Abbreviated Mental Test score <8);<br>• Respiratory rate >30/min;<br>• Age >65;<br>• BP systolic <90 or diastolic ≤ 60 | Score 0: suitable for home treatment;<br>Score 1-2: hospital assessment or admission<br>**Score 3-4: urgent hospital admission**<br>**Give immediate IM Benzylpenicillin or Amoxicillin 1g po (IM Cefotaxime in non-severe penicillin allergy)** if delayed admission/life threatening.[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 choices[2]** | IF CRB65=0:<br>**Amoxicillin**[A+] 500mg *tds* for 7 days ***OR***<br>[**Clarithromycin**[A-] 500mg *bd* for 7 days ***OR***<br>**Doxycycline**[D] 200mg stat/100mg *od* for 7 days] | If CRB65=1 & AT HOME:<br>**Amoxicillin**[A+] 500mg – 1g *tds* ***AND*** **Clarithromycin**[A-] 500mg *bd* both for 7-10 days ***OR***<br>**Doxycycline** alone 200mg stat then 100-200mg *od* for 7-10 days |
| | Some hospital specialists may prescribe high-dose doxycycline 200mg *bd* for 2 days then 200mg *od* for 7-10 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]<br>Aspiration pneumonia is significantly more common in patients who reside in a nursing home or long-term-care facility.[4]<br>Do not use ciprofloxacin first line due to poor pneumococcal activity. Reserve all quinolones for proven resistant organisms.[2] | |
| **Evidence** | Consider doxycycline, alone or combined with amoxicillin, if infection with Mycoplasma pneumoniae 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. **https://www.brit-thoracic.org.uk/document-library/clinical-information/pneumonia/adult-pneumonia/bts-guidelines-for-the-management-of-community-acquired-pneumonia-in-adults-2009-update/**<br>2. Management of Infection Guidance for Primary Care, PHE & BIA, Nov 2012. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Accessed September 2014<br>3. CKS NICE Community Acquired Pneumonia. **http://cks.nice.org.uk/chest-infections-adult#!scenario:1** (Updated Aug 2012) Accessed Aug 2014<br>4. Garcia-Vidal C et al. Low incidence of multidrug-resistant organisms in patients with healthcare-associated pneumonia requiring hospitalization. Clin Microbiol Infect 2011; 17: 1659–1665. | |



# Central Nervous System

## Central Nervous System Infections – Meningitis or Suspected Meningococcal Disease

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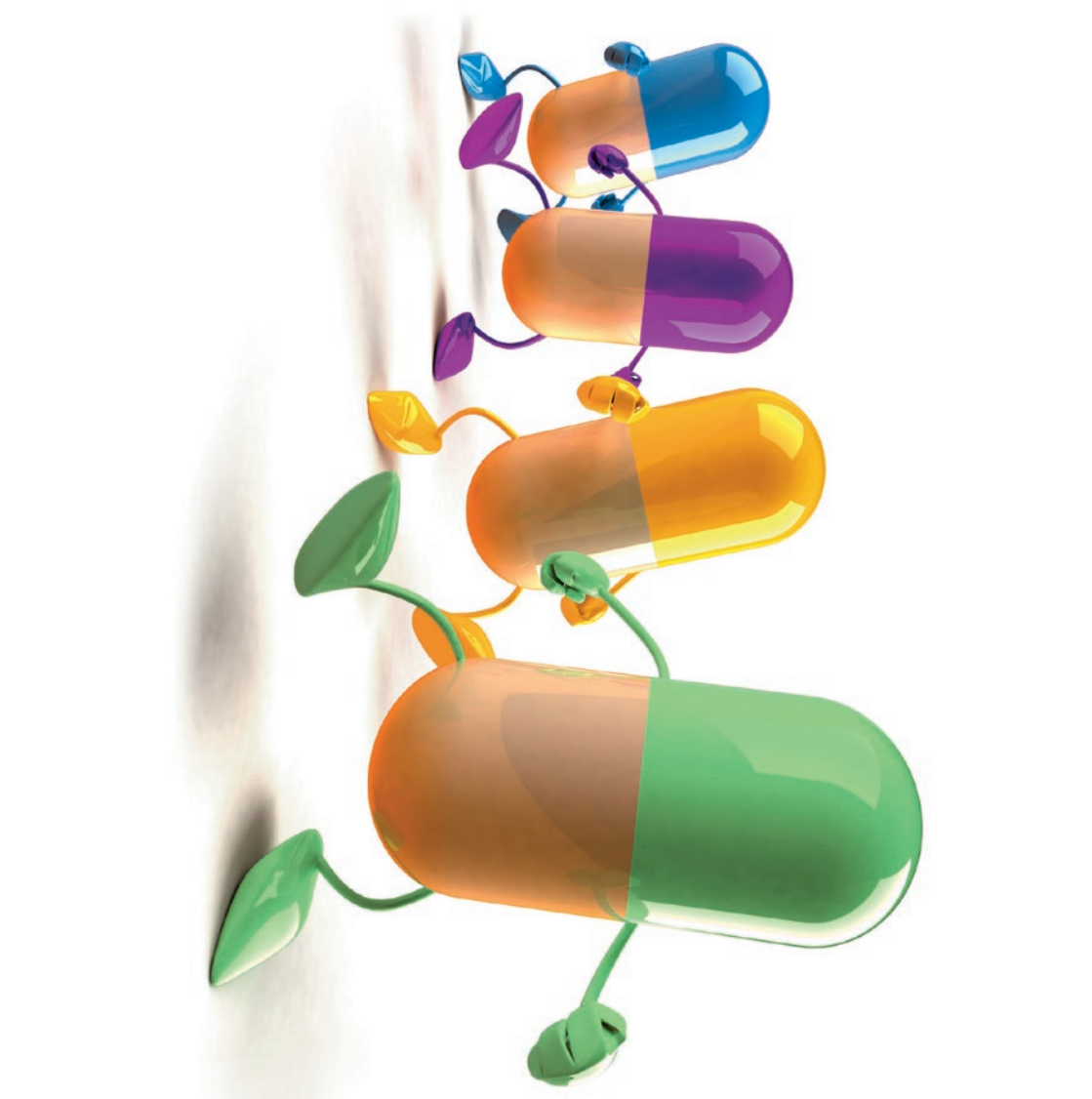
| **When to treat** | Transfer all patients to hospital immediately.[1]<br>IF time before admission, and non-blanching rash, give IV benzylpenicillin or cefotaxime [2,3B+], unless hypersensitive<br>i.e. history of difficulty breathing, collapse, loss of consciousness, or rash.[1B-]<br>If a patient with suspected bacterial meningitis without non-blanching rash cannot be transferred to hospital urgently, benzylpenicillin or cefotaxime should be given before the transfer.[1B-] | | |
| **Treatment choices** | **IV or IM Benzylpenicillin:**[1]<br>Neonate 75mg/kg<br>Child: 1 month - 1yr: 300mg<br>Child: 1yr - 9yrs: 600mg<br>Child: 10-18yrs: 1.2g<br>Adult: 1.2g<br>Give IM if vein cannot be found.[1] | ***OR***<br>**IV or IM Cefotaxime**[1]<br>Neonate 50mg/kg<br>Child: 1 month - 12yrs: 50mg/kg (max 1g)<br>Child: 12-18yrs: 1g<br>Adult: 1g | **If history of immediate hypersensitivity reaction to penicillins or cephalosporins**[4]<br>**IV Chloramphenicol**<br>Child: 1 month - 18 yrs: 25mg/kg IV<br>Adult: 25mg/kg IV |
| | Prevention of secondary case of meningitis.[5] Only prescribe following advice from Public Health Doctor: 9am - 5pm **0845 055 2022**.<br>Out-of-hours contact: **0844 967 0082** (from 1st February 2012). | | |
| **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]<br>Only withhold benzylpenicillin in children and young people who have a clear history of anaphylaxis after a previous dose; a history of a rash following penicillin is not a contraindication.[2] | | |
| **Evidence** | The NICE guideline development group recommended benzylpenicillin because it is the most frequently used antibiotic in primary care and they found no evidence to recommend an alternative antibiotic.[1] | | |
| **References** | 1. Management of Infection Guidance for Primary Care, PHE & BIA,Nov 2012. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Accessed September 2014<br>2. NICE. Bacterial meningitis and meningococcal septicaemia. National Collaborating Centre for Women's and Children's health 2010. (Clinical Guideline 102) **http://guidance.nice.org.uk/CG102/Guidance**<br>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**<br>4. BNF for Children May 2014<br>5. Public Health England 2014 Preventing secondary cases of invasive meningococcal capsular group B (MenB) disease: benefits of offering vaccination in addition to antibiotic chemoprophylaxis to close contacts of cases in the household, educational setting, clusters and the wider community. **https://www.gov.uk/government/collections/meningococcal-disease-guidance-data-and-analysis** Accessed September 2014 | | |



# Urinary Tract
## Infections

## Urinary Tract Infections – Uncomplicated UTI in Women

### When to treat

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]

- Positive nitrite indicates probable UTI, if EITHER blood OR leucocytes also positive = 92% positive predictive value[1A-]
- Negative nitrite, leucocytes and blood = 76% negative predictive value[1A-]

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]

### When to investigate

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

### How to respond to a positive lab report[2]

Single organism ≥ $10^4$ colony forming units (CFU)/mL **or** ≥ $10^5$ mixed growth with one predominant organism **or** E. coli or Staphylococcus saprophyticus ≥ $10^3$ CFU/mL usually indicates UTI in patient with urinary symptoms.
White cells ≥ $10^4$/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.

### Treatment choices

**First line:**[1]
**Nitrofurantoin**[B+] 100mg m/r *bd* for 3 days[3,4]
***OR* Trimethoprim**[B+] 200mg *bd* for 3 days[1A+]

**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) E. coli are increasing: consider nitrofurantoin (or fosfomycin 3g stat on advice of microbiologist).[1]

### Cautions

Avoid nitrofurantoin if eGFR<45ml/min, (risk of peripheral neuropathy; ineffective due to inadequate urine concentrations.[5,6]), although may be suitable in some patients with a eGFR of between 30 - 44ml/min if a short course (3-7 days) is prescribed. Prescribe for lower UTI where the benefits outweigh the risk of side effects.[7]
The activity of nitrofurantoin is reduced with increasing pH; avoid alkalinising agents e.g. potassium citrate.[1]
Trimethoprim resistance has been reported after exposure to Trimethoprim within last 6 months or after multiple courses.[4]

### Evidence

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]

### References


1. Management of Infection Guidance for Primary Care, PHE & BIA Feb 2013. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**
2. PHE. Diagnosis of UTI – Quick Reference Guide for primary care. April 2011. **https://www.gov.uk/government/publications/urinary-tract-infection-diagnosis**
3. SIGN 88 UTI 2012 **http://www.sign.ac.uk/guidelines/fulltext/88/index.html** (Accessed May 2014)
4. Clinical knowledge Summaries Urinary Tract Infection – Lower, Women. **http://cks.nice.org.uk/urinary-tract-infection-lower-women**. (Accessed May 2014)
5. BNF 67, March 2014
6. Sachs J et al. Effect of renal function on urinary recovery of orally administered nitrofurantoin. NEJM 1968; 278(19): 1032-1035.
7. MHRA **http://www.mhra.gov.uk/Safetyinformation/DrugSafetyUpdate/CON452539**.

## Urinary Tract Infections – Lower UTI in Pregnancy

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|---|---|---|
| **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 ≥ $10^4$ colony forming units (CFU)/mL or ≥ $10^5$ mixed growth with one predominant organism or *E. coli* or *Staphylococcus saprophyticus* ≥ $10^3$ CFU/mL usually indicates UTI in patient with urinary symptoms. In adults 'no white cells present' indicates no inflammation & reduces culture significance. Epithelial cells/mixed growth indicates perineal contamination, reducing significance of culture.[3]<br>Women with bacteriuria confirmed by a second urine culture should be treated and have repeat urine culture at each antenatal visit until delivery.[1] | |
| **Treatment choices** | **First line:**[2,3] Treat for 7 days[C]<br>**Amoxicillin** 500mg *tds* ***(if known to be susceptible) OR***<br>**Nitrofurantoin** 100mg m/r *bd* ***OR***<br>**Trimethoprim** 200mg *bd* (off-label). Give folic acid (5mg daily) if first trimester.[4] | **Second line:**[3]<br>**Cefalexin*** 500mg *bd* or 250mg *qds* for 7 days[B-] |
| **Cautions** | The activity of nitrofurantoin is reduced with increasing pH; avoid alkalinising agents e.g. potassium citrate.[2]<br>Trimethoprim is a folate antagonist. Folate supplementation during the first trimester reduces the risk of neural tube defects in offspring of pregnant women treated with trimethoprim.[2] In women with normal folate status, who are well nourished, trimethoprim is unlikely to cause folate deficiency.[4] However, it should not be used by women with established folate deficiency or low dietary folate intake, or by women taking other folate antagonists (e.g. antiepileptic drugs or proguanil).[2,3,4] Avoid nitrofurantoin if eGFR<45ml/min, (risk of peripheral neuropathy; ineffective due to inadequate urine concentrations.[5]), although may be suitable in some patients with a eGFR of between 30 - 44ml/min if a short course (3-7 days) is prescribed. Prescribe for lower UTI where the benefits outweigh the risk of side effects. [6]<br>*High-risk drug for Clostridium difficile 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 88 UTI 2012 **http://www.sign.ac.uk/guidelines/fulltext/88/index.html** (Accessed May 2014)<br>2. Management of Infection Guidance for Primary Care, PHE & BIA, Feb 2013 **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**<br>3. Clinical Knowledge Summaries Urinary Tract Infection – Lower, Women. **http://cks.nice.org.uk/urinary-tract-infection-lower-women#azTab** (Accessed May 2014)<br>4. UK Teratology Information Service. Antibiotic Use in pregnancy Feb 2013, Use of Nitrofurantoin in Preganancy Jun 2012, Use of trimethoprim in pregnancy Dec 2013 (Tel: 0844 892 0909) **www.toxbase.org** (Accessed June 2014)<br>5. BNF 68 September 2014<br>6. MHRA **http://www.mhra.gov.uk/Safetyinformation/DrugSafetyUpdate/CON452539** | |

## Urinary Tract Infections – Lower UTI in Men

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| **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]<br>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]<br>Send pre-treatment MSU3 C OR if symptoms mild/non-specific, use negative dipstick (both nitrite & leucocytes) to exclude UTI.[3,4 C] | |
| **How to respond to a positive lab report** | Follow up after 48 hours (or according to the clinical situation) to check response to treatment and the urine culture results.[4]<br>Obtaining a clean-catch sample of urine in men is easier than in women and a colony count of ≥$10^3$ cfu/ml may be sufficient to diagnose UTI in a man with signs and symptoms as long as 80% of the growth is of one organism.[1] | |
| **Treatment choices** | **First line:**[3,4]<br>Treat for 7 days[3,4 C]<br>**Nitrofurantoin**[B+] 100mg m/r *bd* ***OR***<br>**Trimethoprim**[B+] 200mg *bd* | **Second line:**<br>Perform culture in all treatment failures[3 B]<br>Amoxicillin resistance is common; only use if susceptible.[3 B+]<br>Community multi-resistant Extended-spectrum Beta-lactamase (ESBL) E. coli are increasing: consider **Nitrofurantoin** (or **Fosfomycin** 3g stat plus 2nd 3g dose 3 days later on advice of microbiologist).[3] |
| **Cautions** | Trimethoprim resistance has been reported after exposure to Trimethoprim within last 6 months or after multiple courses.[4]<br>Avoid nitrofurantoin if eGFR<45ml/min, (risk of peripheral neuropathy; ineffective due to inadequate urine concentrations.[5,6]), although may be suitable in some patients with a eGFR of between 30 - 44ml/min if a short course (3-7 days) is prescribed. Prescribe for lower UTI where the benefits outweigh the risk of side effects. [7]<br>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** | 1. SIGN 88 UTI 2012 **http://www.sign.ac.uk/guidelines/fulltext/88/index.html** (Accessed May 2014)<br>2. PHE. Diagnosis of UTI – Quick Reference Guide for primary care. April 2011. **https://www.gov.uk/government/publications/urinary-tract-infection-diagnosis**<br>3. Management of Infection Guidance for Primary Care, PHE & BIA, Feb 2013. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**<br>4. Clinical Knowledge Summaries Urinary Tract Infection (lower) – Men. **http://cks.nice.org.uk/urinary-tract-infection-lower-men#azTab** (Accessed May 2014)<br>5. BNF 67, March 2014<br>6. Sachs J et al. Effect of renal function on urinary recovery of orally administered nitrofurantoin. NEJM 1968; 278(19): 1032-1035<br>7. MHRA **http://www.mhra.gov.uk/Safetyinformation/DrugSafetyUpdate/CON452539**. | |

## Urinary Tract Infections – Catheter-associated UTI

### When to treat

Between 2% and 7% of patients with indwelling urethral catheters acquire bacteriuria each day, even with the application of best practice for insertion and care of the catheter.[1] All patients with a long-term indwelling catheter are bacteriuric, often with two or more organisms.[1] Treatment of asymptomatic bacteriuria does not reduce mortality or prevent symptomatic episodes and causes 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.[1,5]

### When to investigate

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]

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 report

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

- If symptoms have not resolved, change to an antibiotic that the organism is sensitive to.
- If symptoms 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

**Lower UTI:**[6] **Nitrofurantoin** 100mg m/r *bd* for 7 days ***OR***
**Trimethoprim** 200mg *bd* for 7 days

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

### Cautions

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

### Evidence

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

### References


1. SIGN 88 UTI 2012 **http://www.sign.ac.uk/guidelines/fulltext/88/index.html** (Accessed May 2014)
2. PHE. Diagnosis of UTI – Quick Reference Guide for primary care. April 2011. **https://www.gov.uk/government/publications/urinary-tract-infection-diagnosis**
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, PHE & BIA Feb 2013. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**
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 May 2014).
6. Clinical Knowledge Summaries Urinary Tract Infection – Lower, Women. **http://cks.nice.org.uk/urinary-tract-infection-lower-women#!scenario:5** (Accessed May 2014)
7. BNF 67, March 2014
8. Clinical Knowledge Summaries Urinary Tract Infection (lower) – Men. **http://cks.nice.org.uk/urinary-tract-infection-lower-men#azTab** (Accessed May 2014)
9. MHRA **http://www.mhra.gov.uk/Safetyinformation/DrugSafetyUpdate/CON452539**

## Urinary Tract Infections – UTI in Children

**When to treat**

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.[2,5]
**Child < 3 months:** refer urgently for assessment[1,2C]
**Child 3 months - 3 years:** send MSU for culture[1,2 A+]
**Child ≥ 3 years:** use positive dipstick to indicate antibiotics and send MSU for culture[1,2 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.[3]
Send pre-treatment MSU for all children ≥3 months.[4]
Imaging: only refer if child <6 months, recurrent or atypical UTI.[2,4 C]

**When to investigate**

Whenever possible a specimen of urine should be collected for culture and sensitivity testing before starting antibacterial therapy – clean catch if possible.[1,3]

**How to respond to a positive lab report**

Dipstick: positive nitrite & leucocytes = likely UTI.[1,2] Nitrite positive & leucocytes negative, in sample <4hrs old = likely UTI.[1,2]
Single organism ≥ $10^4$ 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.[3]

**Treatment choices**

| **See Children's BNF for doses** | **First line:**[2,3,4] | **Second line:**[4] In accordance with sensitivity results | **Preventing recurrence** |
|---|---|---|---|
| **Lower UTI:** Uncomplicated lower UTI in children > 3 months can be treated for 3 days[3A+] | **Nitrofurantoin**[A-] caps (not m/r unless child >12yrs) or suspension (note: expensive)[3] 3 day course is 'off-license' ***OR*** **Trimethoprim**[A] | If susceptible:<br>**Amoxicillin**[A]<br>***OR***<br>**Cefalexin**[C] | • Address dysfunctional elimination syndromes and constipation.[2]<br>• Encourage children to drink an adequate amount.[2]<br>• Emphasize the importance of not delaying voiding.[2] |
| **Upper UTI:** ***consider hospital admission***[3] | **Co-amoxiclav**[A+] for 7-10 days[A+] | **Cefixime**[A] for 7-10 days [A+] | |

**Evidence**

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.[2] 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.[2] Nitrofurantoin is now contraindicated in patients with an estimated glomerular filtration rate (eGFR) of less than 45 ml/min. However, a short course (3 to 7 days) may be used with caution in certain patients with an eGFR of 30 to 44 ml/min.[6]

**References**


1. PHE. Diagnosis of UTI – Quick Reference Guide for primary care. April 2011. **https://www.gov.uk/government/publications/urinary-tract-infection-diagnosis**
2. NICE. Urinary Tract Infection in Children 2007. (Clinical Guideline 54). **http://www.nice.org.uk/CG54**
3. Clinical Knowledge Summaries Urinary Tract Infection – Children **http://cks.nice.org.uk/urinary-tract-infection-children#azTab** (Accessed May 2014).
4. Management of Infection Guidance for Primary Care,PHE & BIA Feb 2013. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**
5. European Association of Urology. Guidelines on Urological Infections 2013. **http://www.uroweb.org/guidelines/online-guidelines/**
6. MHRA **http://www.mhra.gov.uk/Safetyinformation/DrugSafetyUpdate/CON452539**

## Urinary Tract Infections – Recurrent UTI in Women – Prophylaxis

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|---|---|---|---|
| **When to treat** | Recurrent UTI is defined as ≥ 3 UTIs per year.[1]<br>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]<br>• Continuous or postcoital antimicrobial prophylaxis should be considered to prevent recurrent uncomplicated cystitis in women in whom non-antimicrobial measures have been unsuccessful [3]<br>• In appropriate women with recurrent uncomplicated cystitis, self-diagnosis and self-treatment with a short course 'stand-by' regimen of an antimicrobial agent should be considered.[1,2,3B+] | | |
| **When to investigate** | Seeking specialist advice before starting continuous antibiotic prophylaxis is recommended pragmatically to decide whether the woman needs investigation to exclude an underlying cause.[2] | | |
| **How to respond to a positive lab report** | Before any prophylaxis regimen is initiated, eradication of a previous UTI should be confirmed by a negative urine culture 1-2 weeks after treatment.[3] The choice of antibiotics should be based upon the identification and susceptibility pattern of the organism that causes the UTI and the patient's history of drug allergies.[3] | | |
| **Treatment choices** | **Non-antibiotic treatment:**[2]<br>• Cranberry products reduce the recurrence rate of cystitis, and are available from shops (not on NHS).<br>• Cranberry products should not be taken if warfarin is being used.<br>• High strength capsules (containing at least 200mg of cranberry extract) are recommended because they may be more effective and acceptable than cranberry juice. | **For women in whom episodes of infection are associated with sexual intercourse:**[1B+]<br>**Nitrofurantoin** 50mg-100mg caps stat post-coital dose[1,3] to be taken within 2 hours of intercourse[2] (off-label use)<br>***OR***<br>**Trimethoprim** 100mg stat post-coital dose[1,2] to be taken within 2 hours of intercourse[2] (off-label use) | **Long-term low dose prophylaxis taken at bedtime:**[1A+]<br>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]<br>**Nitrofurantoin** 50-100mg at night[1,3]<br>***OR***<br>**Trimethoprim** 100mg at night[1,3] |
| **Cautions** | Monitor patients on long term nitrofurantoin for signs of pulmonary fibrosis.[4] Avoid nitrofurantoin if eGFR<45ml/min, (risk of peripheral neuropathy; ineffective due to inadequate urine concentrations.[4]), although may be suitable in some patients with a eGFR of between 30 - 44ml/min if a short course (3-7 days) is prescribed. Prescribe for lower UTI where the benefits outweigh the risk of side effects.[5] | | |
| **Evidence** | Nightly prophylaxis: pooled data from 10 RCTs of poor methodological quality calculated a Relative Risk of having one microbiological recurrence was 0.21 (95% CI 0.13 to 0.34), favouring antibiotic and the NNT was 1.85 over 6-12 months. But adverse effects do occur and 30% of women did not adhere to treatment.[1] | | |
| **References** | 1. Management of Infection Guidance for Primary Care, PHE & BIA, Feb 2013. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**<br>2. CKS Urinary Tract Infection (lower) – Women – Recurrent cystitis **http://cks.nice.org.uk/urinary-tract-infection-lower-women#!scenario:**<br>3. European Association of Urology. Guidelines on Urological Infections 2013. **http://www.uroweb.org/guidelines/online-guidelines/**<br>4. BNF 67, March 2014<br>5. MHRA **http://www.mhra.gov.uk/Safetyinformation/DrugSafetyUpdate/CON452539** | | |

## Urinary Tract Infections – Acute Pyelonephritis (Upper UTI)

**When to treat**

Upper urinary tract infection is defined as: evidence of urinary tract infection with symptoms suggestive of pyelonephritis (loin pain, flank tenderness, fever, rigors or other manifestations of systemic inflammatory response).[1] Upper urinary tract infection can be accompanied by bacteraemia, making it a life threatening infection.[1]

Admit to hospital people who:[2]

- Are significantly dehydrated or who are unable to take oral fluids and medications.
- Have signs of sepsis, including:
  - A temperature greater than 38°C or less than 36°C, and
  - Marked signs of illness (such as impaired level of consciousness, perfuse 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 investigate[1]**

Dipstick test the urine for leucocyte esterase and nitrite for evidence of a UTI.[2]

- 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.

If hospital admission not needed, send MSU for culture & sensitivities and start antibiotics.[3C]

**How to respond to a positive lab report**

Single organism ≥ $10^4$ colony forming units (CFU)/mL or ≥ $10^5$ mixed growth with one predominant organism or *E. coli* or *Staphylococcus saprophyticus* ≥ $10^3$ CFU/mL usually indicates UTI in patient with urinary symptoms.[3] Review culture and sensitivity results when they become available, and change the antibiotic if indicated.[2] Consider IV ertapenem if ESBL risk.[3C] If no response within 24 hours, admit.

**Treatment choices**

**First line:**[1,3,4*]
***Ciprofloxacin**[A-] 500mg *bd* for 7 days[A] If susceptible: **Trimethoprim** 200mg *bd* for 14days[1]

**Second line:**[1,3,4] (if no penicillin allergy)
***Co-amoxiclav**[C] 625mg *tds* for 14 days[C]

**Cautions**

High-risk drugs for Clostridium difficile infection but benefits considered to outweigh risks in acute pyelonephritis.[3]
Nitrofurantoin is an ineffective treatment for upper UTI because it does not achieve effective concentrations in the blood.[1]

**Evidence**

* One week of treatment with ciprofloxacin is as effective as two weeks treatment with co-trimoxazole.[1] Evidence about the effectiveness of less than two weeks treatment with co-amoxiclav is lacking.[1]

**References**


1. SIGN 88 UTI 2012 **http://www.sign.ac.uk/guidelines/fulltext/88/index.html** (Accessed May 2014)
2. Clinical Knowledge Summaries Pyelonephritis – acute **http://cks.nice.org.uk/pyelonephritis-acute** (accessed May 2014)
3. Management of Infection Guidance for Primary Care, PHE & BIA, Feb 2013. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**
4. European Association of Urology. Guidelines on Urological Infections 2013. **http://www.uroweb.org/guidelines/online-guidelines** /
5. Public Health England 2013. Acute trust toolkit for the early detection, management and control of carbapenemase-producing Enterobacteriaceae. **https://www.gov.uk/government/publications/carbapenemase-producing-enterobacteriaceae-early-detection-management-and-control-toolkit-for-acute-trusts**

# Genital Tract
## Infections

GTI

| Genital Tract Infections – Criteria for referring patients to specialist care | |
|---|---|
| **Patient risk factors** | Refer patents with the following risk factors for STIs to GUM/Sexual Health Services clinic or general practices with level 2 or 3 expertise in GUM/Sexual Health Services:[1,2]<br>• <25yrs<br>• no condom use<br>• recent (<12mth) or frequent change of sexual partner<br>• previous STI<br>• symptomatic partner |
| **Diseases** | • Syphilis – always refer to GUM/Sexual Health Services<br>• Gonorrhoea – always refer to GUM/Sexual Health Services<br>• Genital Herpes – Treat on suspicion and refer to GUM/Sexual Health Services |
| **Evidence** | See Health Protection Agency and British Infection Association Quick Reference Guide to Management and Laboratory Diagnosis of Abdominal Vaginal Discharge for useful flowchart.[3] |
| **References** | 1. RCGP & BASHH Guidance: Sexually Transmitted Infections in Primary Care (2006) **http://www.bashh.org/guidelines** (Accessed July 2014)<br>2. National Chlamydia Screening Programme **http://www.chlamydiascreening.nhs.uk**/ (Accessed July 2014)<br>3. PHE / BIA: Quick Reference Guide for Primary Care management of Abnormal Vaginal Discharge in Women (amended 26.09.11)<br>4. **https://www.gov.uk/government/publications/abnormal-vaginal-discharge-management-and-laboratory-diagnosis** |

## Genital Tract Infections – Vulvo Vaginal Candidiasis

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|---|---|---|
| **When to treat** | Symptoms suggestive of episodic vulvovaginal candidiasis include external dysuria, vulval pruritus, swelling or redness.<br>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]<br>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]<br>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 lab 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-pregnant** [5]<br>**Clotrimazole**[A+] 10% Vaginal Cream (5g) stat<br>***OR* Clotrimazole**[A+] 500mg pessary stat at night<br>***OR* Fluconazole**[A+] 150mg orally stat | **First line pregnant** [5]<br>**Clotrimazole** [A+] 100mg pessary at night for 6 nights[C]<br>***OR* Miconazole** 2% cream[A+] 5g intravaginally *bd* 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]<br>Clotrimazole and Miconazole damage latex condoms and diaphragms.[6] | |
| **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. Sexually Transmitted Infections, vulvovaginal candidiasis **http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2563903/**<br>2. BASHH 2007. United Kingdom National Guideline on the Management of Vulvovaginal Candidiasis. **http://www.bashh.org/guidelines**<br>3. Candida (female genital.). CKS **http://cks.nice.org.uk/candida-female-genital** (accessed May 2014)<br>4. PHE / BIA: Quick Reference Guide for Primary Care management of Abnormal Vaginal Discharge in Women **https://www.gov.uk/government/publications/abnormal-vaginal-discharge-management-and-laboratory-diagnosis** Accessed September 2014<br>5. British Association of Sexual Health and HIV 2006. Sexually Transmitted Infections: UK National Screening and Testing Guidelines<br>6. BNF July 14. | |

## Genital Tract Infections – Bacterial Vaginosis

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|---|---|---|
| **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]<br>Symptomatic pregnant women should be treated in the usual way[B] and asymptomatic pregnant women may be considered for treatment.[1]<br>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]:<br>• The woman is not at high risk of a sexually transmitted infection (STI).<br>• The woman does not have symptoms of other conditions causing vaginal discharge (e.g. itch, abdominal pain, abnormal bleeding, dyspareunia, fever).<br>• The woman is not pregnant, post-natal, post-miscarriage, or post-termination.<br>• Symptoms have not developed after a gynaecological procedure.<br>• 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]:<br>• Perform a speculum examination.<br>• If pH paper is available, test the pH of the vaginal fluid (pH > 4.5 is consistent with a diagnosis of BV).[3]<br>• 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]<br>**Metronidazole** 400mg oral *bd* for 5-7 days[A+], (preferred over 2g stat for efficacy and also in pregnancy)[5]<br>***OR* Metronidazole** 2g stat [A+] (consider suspension formulation at night for better tolerability; avoid 2g dose in pregnancy)[5]<br>***OR* Metronidazole** 0.75% vaginal gel 5g applicatorful at night for 5 days [A+]<br>***OR* Clindamycin** 2% vaginal cream, 5g applicatorful at night for 7 days [A+] | |
| **Cautions** | Clindamycin cream weakens condoms-advise against use during treatment.[1] | |
| **Evidence** | All treatments have been shown to have cure rates of 70-80%.[1A] 7 day course of oral metronidazole is slightly more effective than 2g stat.[1A]<br>Topical treatment gives similar cure rates[A+] but is more expensive. | |
| **References** | 1. BASHH: National Guideline For The Management Of Bacterial Vaginosis (2012) **http://www.bashh.org/guidelines** (Accessed May 2014)<br>2. CKS Bacterial Vaginosis **http://cks.nice.org.uk/bacterial-vaginosis#azTab** (accessed May 2014)<br>3. PHE / BIA: Quick Reference Guide for Primary Care management of Abnormal Vaginal Discharge in Women (amended 26.09.11)<br>4. **https://www.gov.uk/government/publications/abnormal-vaginal-discharge-management-and-laboratory-diagnosis**<br>5. Management of Infection Guidance for Primary Care, PHE & BIA, Jan 2012 **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**<br>6. UK Teratology Information Service. Use of metronidazole in pregnancy. 2008. (Tel: 0844 892 0909) **www.toxbase.org** (Accessed August 2014)<br>7. BNF July 2014 | |

## Genital Tract Infections – Chlamydia Trachomatis

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|---|---|---|
| **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]<br>Opportunistically screen all aged 15-25yrs.[3,4] | |
| **How to respond to a positive lab result** | Treat partners and refer to GUM service.[3B+]<br>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]<br>**Azithromycin** 1g stat[A+]<br>***OR* Doxycycline** 100mg *bd* for 7 days[A+] | **First line: Pregnant**<br>**Erythromycin**[A+] 500mg *bd* for 14 days[6]<br>***OR* Amoxicillin**[A+] 500mg *tds* for 7 days<br>***OR* Azithromycin**[A+] 1g (off-label use) stat (only use if alternatives are inappropriate)[5] **or breastfeeding**[1,2,3,5] |
| **Cautions** | **Refer all pregnant patients to GUM/Sexual Health Services.**[1,2] Pregnancy or breastfeeding: azithromycin is the most effective option.[3A+]<br>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%).<br>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]<br>Erythromycin and amoxicillin are less effective than doxycycline or azithromycin.[1,2,3] | |
| **References** | 1. CKS Chlamydia **http://cks.nice.org.uk/chlamydia-uncomplicated-genital#azTab** (acsessed May 2014)<br>2. BASHH Management of Chlamydia trachomatis genital tract infection [2006]. **http://www.bashh.org/guidelines** (accessed May 2014)<br>3. Management of Infection Guidance for Primary Care, PHE & BIA, Jan 2012 **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**<br>4. British Association of Sexual Health and HIV 2006. Sexually Transmitted Infections in Primary Care: UK National Screening and Testing Guidelines. **http://www.bashh.org/documents/Sexually%20Transmitted%20Infections%20in%20Primary%20Care%202013.pdf**<br>5. UK Teratology Information Service. The treatment of infections in pregnancy. (Tel: 0844 892 0909) **www.toxbase.org** (Accessed August 2014)<br>6. BNF 66, March 2014 | |

| Genital Tract Infections – Trichomoniasis | | |
|---|---|---|
| **When to treat** | Treat only laboratory confirmed diagnosis.[1] Sexual partner(s) should be treated simultaneously.[2]<br>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]<br>Screening of asymptomatic patients is not recommended.[4] | |
| **How to respond to a positive lab 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:**<br>**Metronidazole**[A+] 400mg *bd* for 5-7days[3]<br>***OR***<br>**Metronidazole** 2g stat[3A+]<br>(consider suspension formulation at night for better tolerability[D]; avoid 2g dose in pregnancy/breastfeeding[3]) | **Symptomatic relief if metronidazole declined (not cure):**[3]<br>**Clotrimazole** pessary[B+] 100mg each night for 6 nights |
| **Cautions** | The single dose has the advantage of improved compliance and being cheaper; however there is some evidence to suggest that the failure rate is higher with single dose, especially if partners are not treated concurrently.[2] | |
| **Evidence** | Treating partners does not reduce relapse.[5B+]<br>Most strains of T. vaginalis are highly susceptible to metronidazole and related drugs (approx. 95% cure rate). There is a spontaneous cure rate in the order of 20-25%.[2] | |
| **References** | 1. CKS Trichomoniasis **http://cks.nice.org.uk/trichomoniasis#azTab** (accessed May 2014)<br>2. BASHH United Kingdom National Guideline on the Management of Trichomonas vaginalis 2014. **http://www.bashh.org/guidelines** (accessed June 2014)<br>3. Management of Infection Guidance for Primary Care, PHE & BIA, Jan 2012.<br>**https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**<br>BASHH United Kingdom National Guidelines for Primary Care 2013<br>**http://www.bashh.org/documents/Sexually%20Transmitted%20Infections%20in%20Primary%20Care%202013.pdf**<br>4. PHE 2011 Management and diagnosis of abnormal vaginal discharge.<br>**https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/345793/Vaginal_Discharge_treatment_guidance.pdf** | |

## Genital Tract Infections – Pelvic Inflammatory Disease (PID)

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| **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]<br>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 lab 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/documents/3633** | |
| **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 choices[3]** | If low risk of Gonococcal infection[B+]<br>**Metronidazole** 400mg *bd*<br>***PLUS:***<br>[**Doxycycline**[1] 100mg *bd* **OR Ofloxacin** 400mg *bd* [B+]]<br>All for 14 days | If high risk of GC[B+] (partner has it, severe symptoms, sex abroad)<br>**Ceftriaxone** 500mg IM stat[C] (seek expert advice if history of severe penicillin allergy)<br>***PLUS:***<br>**Metronidazole** 400mg PO *bd* for 14 days<br>***PLUS:***<br>**Doxycycline** 100mg *bd* for 14 days |
| **Cautions** | PID in pregnancy requires parenteral treatment – refer to specialist.[1]<br>**Ceftriaxone** is supplied as a powder which needs to be reconstituted with lidocaine solution. To reconstitute, mix the contents of a 1g vial with 3.5mL of 1% lidocaine injection BP: half (2mL) of the resulting solution provides 500mg ceftriaxone. It should be given by deep intramuscular injection.[4]<br>**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] | |
| **Evidence** | 28% of gonorrhoea isolates resistant to quinolones.[3B+] | |
| **References** | 1. BBASHH. UK National Guideline for the Management of Pelvic Inflammatory Disease 2011. **http://www.bashh.org/guidelines**<br>2. CKS Pelvic Inflammatory Disease NICE **http://cks.nice.org.uk/pelvic-inflammatory-disease#azTab**<br>3. Management of Infection Guidance for Primary Care, PHE & BIA, Feb 2013<br>**https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Accessed September 2014<br>4. Electronic Medicines Compendium – Ceftriaxone Wockhardt 1g. **www.medicines.org.uk** (Accessed June 2014) | |

## Genital Tract Infections – Acute Prostatitis

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| **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]<br>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]<br>(An STI is much more likely in men <35 years. Send first-catch urine for NAATs).[2]<br>Admit to hospital if the man is unable to take oral antibiotics, has acute urinary retention or is severely ill.[1]<br>Refer urgently if the man has a pre-existing urological condition and consider urgent referral if the man has diabetes or is immunocompromised.[1] | |
| **How to respond to a positive lab result** | Reassess after 24-48 hours:<br>Review the culture results and ensure that an appropriate antibiotic is being used.[1]<br>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]<br>Treatment of sexual partners is not required.[2] | |
| **General advice** | Adequate hydration should be maintained, rest encouraged and analgesics such as non-steroidal anti-inflammatory drugs if required.[3]<br>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]<br>Following recovery, refer for investigation to exclude structural abnormality of the urinary tract.[1] | |
| **Treatment choices** | **First line:**[3]<br>**Ciprofloxacin*** 500mg *bd* for 28 days[C]<br>***OR* Ofloxacin*** 200mg *bd* for 28 days | **Second line or if allergic to quinolones:**[3]<br>**Trimethoprim** 200mg *bd* for 28 days |
| **Cautions** | Avoid quinolones in people with a history of tendon disorders related to quinolones, or a history of seizures or conditions that predispose to seizures. *High-risk drug for *Clostridium difficile* infection and should be avoided in at-risk patients. | |
| **Evidence** | Quinolones achieve higher prostate levels than trimethoprim.[3]<br>UK guidelines recommend treatment for at least 4 weeks to prevent the development of chronic prostatitis.[1] | |
| **References** | 1. CKS – Acute prostatitis **http://cks.nice.org.uk/prostatitis-acute#azTab** (Accessed July 2014)<br>2. BASHH Management of Chlamydia trachomatis genital tract infection [2006]. **http://www.bashh.org/guidelines**<br>3. Management of Infection Guidance for Primary Care, PHE & BIA, Feb 2013. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** BNF July 2014 | |

## Genital Tract Infections – Balanitis

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

## Genital Tract Infections – Epididymo-Orchitis

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| **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]<br>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]<br>Ideally refer for same-day or next-day assessment by a sexual health specialist.[1] If this is not possible: Obtain a mid-steam urine for dipstick, microscopy, and culture and test for sexually transmitted infections.[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]<br>If a urinary tract infection is confirmed, refer to a urologist to investigate for an underlying structural abnormality or urinary tract obstruction.[1] | |
| **How to respond to a positive lab result** | Tailor treatment according to culture and sensitivity results.<br>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]<br>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]<br>**Ceftriaxone*** 500mg stat IM ***PLUS***<br>**Doxycycline** 100mg *bd* for 10-14 days<br>No intercourse until review. Notify partner. | **Most probably due to chlamydia or other non-gonococcal organism** (no risk factors for gonorrhoea) consider:[3]<br>**Doxycycline** 100mg *bd* for 10-14 days ***OR***<br>**Ofloxacin*** 200mg *bd* for 14 days<br>No intercourse until review. Notify partner |
| | **All causes, but patient is allergic to tetracyclines and/or cephalosporins:**[2]<br>**Ofloxacin*** 200mg *bd* for 14 days | **If due to an enteric organism (for example, *Escherichia coli*):**[3]<br>**Ofloxacin*** 200mg *bd* for 14 days ***OR***<br>**Ciprofloxacin*** 500mg *bd* 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]<br>Observations in Asia have raised concern over the adequacy of 400mg cefixime for the treatment of genital gonorrhoea.[4] | |
| **References** | 1. CKS – Scrotal swellings - management **http://cks.nice.org.uk/scrotal-swellings#azTab**<br>2. British Association of Sexual Health and HIV 2010. United Kingdom national guideline for the management of epididymo-orchitis. **http://www.bashh.org/guidelines**<br>3. British Association of Sexual Health and HIV 2011. Clinical care pathway for management of epididymo-orchitis **http://www.bashh.org/guidelines**<br>4. British Association of Sexual Health and HIV 2011. UK National Guideline for the Management of Gonorrhoea in Adults **http://www.bashh.org/guidelines** | |

# Gastro-intestinal
## Infections

## Gastro-intestinal infections – Eradication of *Helicobacter pylori*

### When to treat: test and treat approach[1,2,6]

**Patients aged 55 years and older, with new unexplained & persistent (over 4-6 weeks) recent onset dyspepsia, should be referred urgently for endoscopy, to exclude cancer**[1,3,4,5] otherwise the presence of *H. pylori(HP)* should be confirmed by Stool helicobacter antigen test (SAT) or Urea breath test (UBT) before starting eradication therapy.[1,2]

Test in the following situations[1,2] (see below for type of tests):

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

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

### When to investigate

- Test eligible patients for HP (see above) using a SAT.[A] UBT may be available if following endoscopy.
- Do not perform SAT or UBT within at least 2 weeks of PPI or 4 weeks of antibiotics
- Patients testing negative – reassure as NPV is >95%. Treat as functional dyspepsia with low dose PPI or $H_2A$ for one month, then as required.

Consider re-testing for HP,[1,7] preferably by UBT, but SAT is an alternative[1,7]. Withhold re-testing for at least 2 weeks after PPI or 4 weeks after antibiotic treatment.

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

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

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

Refer for Helicobacter culture & Susceptibility testing at Endoscopy[1]:

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

Seek advice on gastric biopsy specimens and Dent's transport medium by contacting the PHE in London

### Treatment choices

- Check antibiotic history – Do not use clarithromycin or metronidazole if used in the last year for any infection
- Avoid amoxicillin-containing regimen for those with known or suspected penicillin allergy
- Stress importance of compliance to increase eradication rates

**First choice:** Triple-therapy regimen with twice daily dosing for 7 days[1,4,6,7] (See 'Evidence' below for longer duration)
PPI eg: **Lansoprazole** 30mg or **Omeprazole** 20mg or **Pantoprazole** 40mg *bd*
***PLUS*** 2 antibiotics (not prev used):
Either **Amoxicillin** 1g and **Clarithromycin** 500mg *bd*
***OR*** **Amoxicillin** 1g and **Metronidazole** 400mg *bd*
***OR*** **Clarithromycin** 250mg and **Metronidazole** 400mg *bd*

**Second Line:** Quadruple-therapy for 14 days PPI twice daily
eg: **Lansoprazole** 30mg or **Omeprazol**e 20mg or **Pantoprazole** 40mg *bd*
***PLUS*** **Tripotassium dictratobismuthate** 240mg *bd*
***PLUS*** any 2 antibiotics (not prev used) from the following:

- **Tetracycline hydrochloride** 500mg *qds*
- **Metronidazole** 400mg *bd*
- **Clarithromycin** 500mg *bd*
- **Amoxicillin** 1g *bd*

*continued overleaf*

| Gastro-intestinal infections – Eradication of *Helicobacter pylori* *(continued)* | |
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| **Cautions** | If diarrhoea develops, consider *Clostridium difficile* infection and review need for treatment.[1] |
| **Evidence** | Helicobacter test & treat strategies will benefit patients with ulcer disease<br>Eradication rate is about 85%[1,6]. Increasing the duration of PPI-based triple therapy to 7 or 10 days, increases HP eradication rates[8]. However patients experience a marginal significant increase in adverse events though the rate of discontinuation of treatment showed no significant difference.[8] |
| **References** | 1. Test and treat for Helicobacter pylori in dyspepsia – Quick reference guide for primary care. PHE & BIA 2012 **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/346305/Helicobacter_guidance_update_post_Maastricht_IV_24_10.pdf** (accessed 15 September 2014)<br>2. Malfertheiner P et al., the European Helicobacter Study Group. Management of Helicobacter pylori infection – the Maastricht IV / Florence Consensus Report. Gut 2012;61:646-664<br>3. NICE Clinical Guideline no. 27: Referral guidelines for suspected cancer. June 2005, last modified April 2011 **http://www.nice.org.uk/guidance/cg27/resources/guidance-referral-guidelines-for-suspected-cancer-pdf** (accessed 15 September 2014).<br>4. NICE Clinical Guideline no. 184: Dyspepsia and gastro-oesophageal reflux disease: investigation and management of dyspepsia, symptoms suggestive of gastro-oesophageal reflux disease or both. September 2014 **http://www.nice.org.uk/guidance/cg184/resources/guidance-dyspepsia-and-gastrooesophageal-reflux-disease-pdf** (accessed 15 September 2014)<br>5. NICE Clinical guideline no. 141: Acute upper gastrointestinal bleeding: management. June 2012 **http://www.nice.org.uk/Guidance/CG141** (accessed 15 September 2014)<br>6. BNF September 2014 **https://www.medicinescomplete.com/mc/bnf/current/PHP272-dyspepsia-and-gastro-oesophageal-reflux-disease.htm** (accessed 15 September 2014)<br>7. Clinical Knowledge Summaries: Dyspepsia – proven GORD / proven non-ulcer / proven peptic ulcer / unidentified cause 2012 **http://cks.nice.org.uk/#azTab** (accessed 15 September 2014)<br>8. Uuan Y et al., optimum duration of regimens for Helicobacter pylori eradication (Review) Cochrane Collaboration. The Cochrane Library 2013, Issue 12 **http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD008337.pub2/abstract** (accessed 10th September 2014) |

## Gastro-intestinal infections – Infectious Diarrhoea

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| **When to treat** | Definition of acute diarrhoea: 3 or more episodes a day, <14d and sample takes shape of pot.[1]<br>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]<br>If Campylobacter is strongly suspected as the cause of diarrhoea (e.g. undercooked meat and abdominal pain), consider empirical treatment with clarithromycin if treating early.[2]<br>Urgently refer all previously healthy children with acute painful, bloody diarrhoea or confirmed *E. coli* O157.[1] |
| **When to investigate** | Send a stool specimen for culture and sensitivity if:<br>• systemically unwell; blood or pus in the stool;<br>• it is necessary to exclude other pathologies;<br>• immunocompromised;<br>• diarrhoea occurs after high risk foreign travel (also request tests for ova, cysts, and parasites);<br>• recent antibiotics or hospitalisation (also request *C. difficile*);<br>• diarrhoea is persistent (e.g. >1week).[3]<br>If the diarrhoea has stopped, culture is rarely indicated, as recovery of the pathogen is unlikely.[1]<br>Consider blood tests if infection and other causes of acute diarrhoea excluded and a chronic cause is suspected.[3]<br>Consult local HPU if: Suspected public health hazard; outbreaks of diarrhoea in the family or community; infected with certain organisms (e.g. *E. coli* O157) where there may be serious clinical sequelae to an infection.[3] |
| **How to respond to a positive lab result[1]** | 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.<br>*Campylobacter*: Antibiotic therapy has little effect on duration of symptoms unless given very early in illness course.<br>*Giardia lamblia* and *Entamoeba histolytica* should be treated according to sensitivity results.<br>Unless symptoms persist, *Blastocystis* and *Dientamoeba fragilis* do not usually require treatment if otherwise healthy.<br>*C.difficile:* See *C.difficile* recommendations. |
| **Treatment choices** | Fluid replacement is essential.<br>If systemically unwell and campylobacter suspected consider **Clarithromycin** 250-500mg *bd* for 5-7days if treated early.[2C] |
| **Evidence** | There are no routine methods for detecting *enterotoxigenic E. coli*, the commonest cause of traveller's diarrhoea.[1]<br>Quinolones are not recommended because there is increasing resistance in *Campylobacter* to quinolones.[2] |
| **References** | 1. PHE 2010 Infectious diarrhoea Quick reference guide for primary care **https://www.gov.uk/government/publications/infectious-diarrhoea-microbiological-examination-of-faeces**<br>2. Management of Infection Guidance for Primary Care, PHE & BIA, Jan 2012. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**<br>3. NICE CKS – Diarrhoea – adults **http://cks.nice.org.uk/diarrhoea-adults-assessment** (accessed June 2014) |

## Gastro-intestinal infections – Diverticulitis

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| **When to treat**[1] | 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:<br>• pain cannot be managed with paracetamol;<br>• hydration cannot be easily maintained with oral fluids;<br>• oral antibiotics cannot be tolerated;<br>• the person is frail or has a significant comorbidity that is likely to complicate their recovery (particularly if immunocompromised);<br>• the person has any of the following suspected complications: rectal bleeding that may require transfusion, perforation and peritonitis, intra-abdominal abscess, fistula.<br># There is low level evidence that patients suitable for management at home may be managed without the use of antibiotics. In general a course of antibiotics is recommended.[2] | |
| **When to investigate**[1] | If symptoms persist after 48 hours despite conservative management at home admit patient to hospital. | |
| **General advice**[1] | Review within 48 hours or sooner if symptoms deteriorate. Arrange admission if symptoms persist or deteriorate. Prescribe paracetamol for pain.<br>Recommend clear liquids only. Gradually reintroduce solid food as symptoms improve over 2-3 days. | |
| **Treatment choices**[1,3] | **First choice:**<br>**Co-amoxiclav*** 625mg tablets *tds* for at least 7 days (7-10 days) | **Second choice or if allergic to co-amoxiclav:**<br>**Metronidazole** 400mg *tds* for 7 days<br>***PLUS***<br>**Ciprofloxacin*** 500mg *bd* for at least 7 days (7-10 days) |
| | *High-risk for *C. difficile infection*. Alternative option **Co-trimoxazole** 960mg *bd* **PLUS Metronidazole** 400mg tds for at least 7 days.[2] | |
| **Evidence** | Avoid nonsteroidal anti-inflammatory drugs (NSAIDs) and opioid analgesics such as co-codamol, which have been identified as risk factors for diverticular perforation.[1] | |
| **References** | 1. CKS – Diverticular disease Available at **http://cks.nice.org.uk/diverticular-disease#!topicsummary** Date accessed 7.8.2014<br>2. Royal College of Surgeons of England. Commissioning Guide 2013: Colonic Diverticular Disease. Available at **http://www.rcseng.ac.uk/healthcare-bodies/docs/published-guides/colonic-diverticular-disease** Date accessed 7.8.2014<br>3. Jacobs D. Diverticulitis NEJM 2007; 357: 2057-2066 Available at **http://www.nejm.org/doi/full/10.1056/NEJMcp073228** Date accessed 7.8.2014 | |

## Gastro-intestinal infections – *Clostridium difficile* Infection

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| **When to treat**[1] | *C. difficile* spectrum ranges from asymptomatic carriage to severe life-threatening illness and management is based on clinical presentation and symptoms. Asymptomatic carriage does not require treatment. People with mild disease may not require specific *C. difficile* antibiotic treatment.[1] Treat patients with mild-to-moderate CDI. Patients who are Glutamate Dihydrogenase (GDH) positive will not need treatment if toxin negative.<br>If the patient has features of severe or life-threatening CDI, or their condition is rapidly deteriorating, admit to hospital.<br>If the condition has improved considerably or resolved without treatment, consider possibility of false-positive result. **Mild CDI:** No increased white cell count (WCC) and typically associated with <3 episodes of loose stools/day.[2B+] **Moderate CDI:** Increased WCC but <15 x $10^9$/L and typically associated with 3–5 loose stools per day.[2C] **Severe CDI:** WCC >15 x $10^9$/L, or an acutely rising serum creatinine (>50% above baseline), or a temperature >38.5°C, or evidence of severe colitis. The number of stools may be a less reliable indicator of severity.[2C] **Life-threatening CDI**: Signs and symptoms include hypotension, partial or complete ileus, or toxic megacolon.[2B+] | | | |
| **When to investigate**[1] | Send stool specimen for *C. difficile* investigation if a clinical diagnosis of CDI is suspected, and the person is symptomatic with liquid/loose stools (consistency that takes the shape of the container).[3] Consider risk factors for CDI, including advanced age, any recent antibiotic treatment (particularly Clindamycin, Cephalosporins, Ciprofloxacin, Co-amoxiclav), underlying morbidity (abdominal surgery, cancer, chronic renal disease, tube feeding), current use of PPI's or other acid-suppressive drugs, recent hospitalization, exposure to other cases, inflammatory bowel disease, history of CDI.[3] Do not re-test people with a positive CDI if they are still symptomatic within a period of 28 days. Do not repeat tests to confirm clearance in asymptomatic patients. Only re-test to confirm recurrent CDI if the symptoms resolve and then recur.[3] | | | |
| **How to respond to a positive lab result** | 2-stage CDI testing uses a screening test to detect the presence of *C. difficile* bacteria and a Toxin test to detect the excretion of toxin causing disease.[4]<br>• Screening test negative (Negative Predictive Value = 98.9%) CDI very unlikely to be present.[4]<br>• Screening test positive BUT Toxin test negative – potential for carriage or active CDI, manage based on symptoms, consider alternative cause of diarrhea or possibility of false negative Toxin test.[4]<br>• Screening test positive AND Toxin test positive (Positive Predictive Value = 91.4%) – CDI likely to be present and associated with poor outcome.[4]<br>Start treatment based on results AND clinical assessment. Discontinue precipitating antibiotic(s) wherever possible; agents with less risk of inducing CDI can be substituted if an underlying infection still requires treatment. Discontinue other drugs that might cause diarrhoea.[1B+] Stop unnecessary PPI's.[B] | | | |
| **Treatment choices** | **General advice:**[3]<br>Review the person daily and monitor for signs of increasing severity of disease as they may deteriorate rapidly. | **First episode (mild and moderate CDI only):**[1,5]<br>**Metronidazole** 400-500mg *tds* for 10-14 days[A] | **Second episode or severe/ type027:**<br>**Oral Vancomycin** 125mg *qds* for 10-14 days | Recurrence within 30 days AND CDI toxin positive:<br>**Fidaxomicin*** 200mg *bd* for 10-14 days[5,6]<br>*only on the recommendation of a consultant medical microbiologist following recurrent relapse |
| **Cautions** | Antimotility agents (such as loperamide) should be avoided in acute infection due to the risk of precipitating toxic megacolon.[1] If possible, avoid other drugs with anti-peristaltic effects (such as opioids).[3] Hand hygiene with soap and water, avoid alcohol hand rubs. | | | |

*continued overleaf*

| Gastro-intestinal infections – *Clostridium difficile* Infection *(continued)* | |
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| **Evidence** | 70% of patients respond to Metronidazole in 5 days; 92% in 14 days[7] Administration of currently available probiotics is not recommended to prevent CDI or antibiotic associated diarrhoea.[1]<br>Recurrent disease occurs in about 20% of patients treated initially with either Metronidazole or Vancomycin and in 50-60% patients following a second episode of CDI.[1] A variable proportion of recurrences are reinfections (20-50%) as opposed to relapses due to the same strain. Relapses tend to occur in the first two weeks after treatment cessation.[1] |
| **References** | 1. PHE Updated guidance on the management and treatment of Clostridium difficile infection. May 2013 **https://www.gov.uk/government/publications/clostridium-difficile-infection-guidance-on-management-and-treatment**<br>2. DH. Clostridium difficile infection: How to deal with the problem. December 2008. **https://www.gov.uk/government/publications/clostridium-difficile-infection-how-to-deal-with-the-problem**<br>3. NICE Clinical knowledge Summaries. Diarrhoea – antibiotic associated updated July 2013. **http://cks.nice.org.uk/diarrhoea-antibiotic-associated#!scenario**<br>4. DH. Updated guidance on the diagnosis and reporting of Clostridium difficile. March 2012. **https://www.gov.uk/government/publications/updated-guidance-on-the-diagnosis-and-reporting-of-clostridium-difficile**<br>5. NICE Evidence Summary. Clostridium difficile infection: fidaxomicin. July 2012. **http://www.nice.org.uk/advice/esnm1**<br>6. PHE Managing common infections: guidance for primary care. **https://www.gov.uk/government/publications/managing-common-infections-guidance-for-primary-care**<br>7. Belmares et al. Outcome of metronidazole therapy for Clostridium difficile disease. J. Infection December 2007. **http://www.ncbi.nlm.nih.gov/pubmed/17983659** |

| Gastro-intestinal infections – Travellers' Diarrhoea (Stand-by or Prophylactic Treatment) | | |
|---|---|---|
| **When to treat** | Travellers' diarrhoea is, for most people, a non-serious, self-limiting illness, lasting 3-4 days which will recover without antibiotic treatment.[1] Do not routinely offer prophylactic or standby antibiotics for prevention of travellers' diarrhoea.[1]<br>**Prophylactic antibiotics:** Consider if the patient is at high risk of diarrhoea and: Is immunocompromised; at high risk of complications (e.g. Crohn's disease, UC, colostomy, renal disease, congestive heart failure) or if diarrhoea could severely impact the purpose of a critical trip.[1]<br>**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]<br>High-risk countries are defined as most of Asia, the Middle-East, Africa, Mexico, Central and Southern America.[2] | |
| **When to investigate** | Advise travellers to seek medical care if symptoms do not improve within two days (earlier if elderly) or they have a fever or are passing blood/mucous. Seek immediate attention for children with diarrhoea if dehydration; vomiting; fever or blood.[3] | |
| **General advice** | Provide advice on food hygiene and safe drinking water if the person is travelling to locations with low standards of hygiene and sanitation.[1] | |
| **Treatment choices** | **First line:**<br>Advise the use of oral rehydration salt solution for the management and prevention of dehydration (particularly for children and infants).[1]<br>Loperamide can be considered for travellers in whom frequent diarrhoea is inconvenient.[3]<br>Avoid loperamide in children and patients with inflammatory bowel disease, a fever or blood in stool.[3] | **Prophylaxis: Ciprofloxacin** 500mg *od* (on private Rx) for up to 3 weeks. If contra-indicated seek specialist advice[1]<br>**Standby:** (start if symptoms moderate/severe):<br>**Ciprofloxacin** 500mg *bd* for 3 days (on private Rx)[2]<br>***OR***<br>If ciprofloxacin contra-indicated or travelling to Thailand/Far East:<br>**Azithromycin** 500mg *od* for 3 days (on private Rx)[1] |
| **Evidence** | Azithromycin, bismuth salicylate, loperamide and probiotics are not recommended for prophylaxis.[1] Antibiotic treatment is associated with shorter duration of diarrhoea but higher incidence of side-effects.[4]<br>The combination of loperamide and an antibiotic in moderate diarrhoea may lead to more rapid improvement compared with either agent alone.[3] | |
| **References** | 1. NICE CKS – Diarrhoea – prevention & advice for travellers **http://cks.nice.org.uk/diarrhoea-prevention-and-advice-for-travellers** (accessed June 2014)<br>2. Management of Infection Guidance for Primary Care, PHE & BIA, Jan 2012. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**<br>3. Travellers' diarrhoea. PHE 2011 **www.nathnac.org** (Accessed June 2014)<br>4. De Bruyn G, Hahn S, Borwick A. Antibiotic treatment for travellers' diarrhoea. Cochrane Database of Systematic Reviews 2000, Issue 3. Art. No.: CD002242.. | |

## Genital Tract Infections – Threadworms

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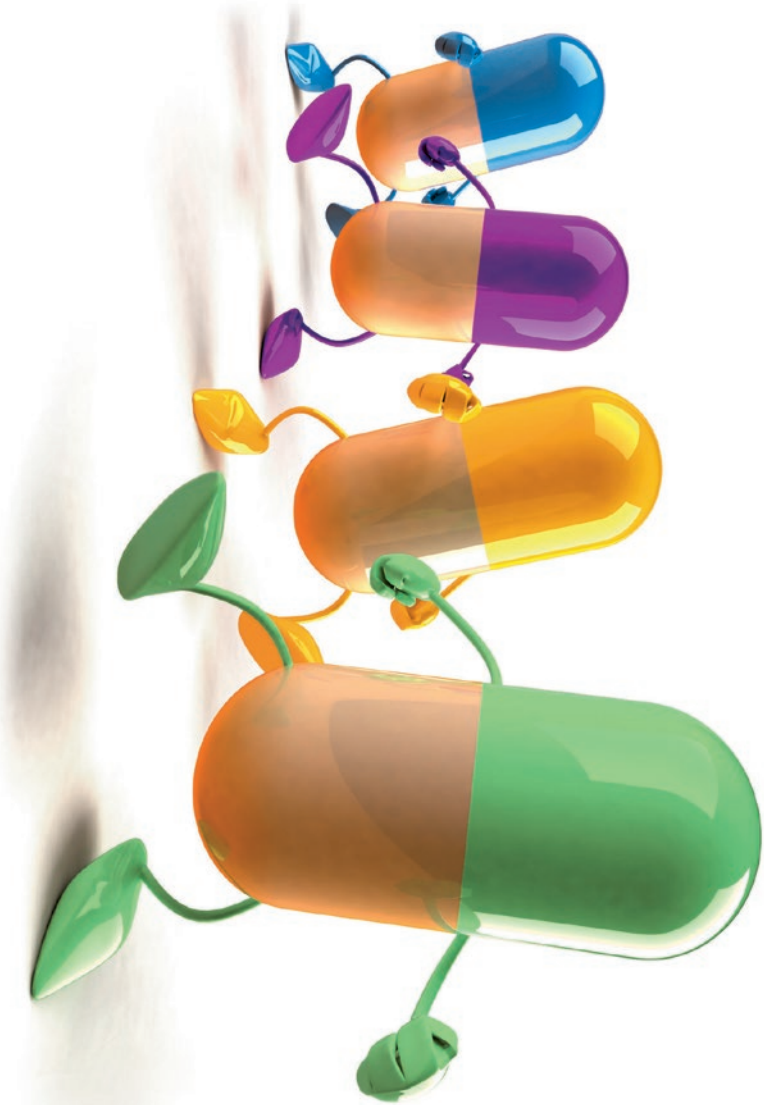
| **When to treat**[1] | Treat if threadworms have been seen or their eggs have been detected. All members of the household should be treated at the same time even if asymptomatic (unless treatment is contraindicated). | |
| **When to investigate**[1] | If the diagnosis is uncertain, the adhesive tape test for eggs may be useful – the tape should be examined under a microscope. If there are frequent recurrences consider seeking advice from a paediatrician or consultant in infectious diseases. | |
| **General advice**[2] | In conjunction with treatment, advise hygiene measures for 2 weeks (hand hygiene, pants at night, morning shower) **PLUS** wash sleepwear, bed linen, dust, and vacuum on day one.[C] | |
| **Treatment choices** | **First line for adults and children aged >6 months:**[2]<br>**Mebendazole** 100mg stat chewable tablet (off label if <2yrs)<br>Repeat in 2 weeks if infestation persists[1] | **For children aged <6 months**:[1]<br>6 weeks strict hygiene to prevent faecal-oral re-infection[C] |
| **Cautions**[1] | 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. | |
| **Evidence**[1,3] | 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.<br>It is generally accepted that mebendazole has a 90-100% cure-rate[3], however it has few contraindications and post-marketing surveillance has revealed no serious safety concerns.[1]<br>Hygiene measures, plus physical removal advice is based on expert opinion.[1] | |
| **References** | 1. CKS Threadworm (Available at **http://cks.nice.org.uk/threadworm#!topicsummary** Date accessed 24.7.14)<br>2. Management of Infection Guidance for Primary Care, PHE & BIA, 14/4/14. (Available **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Primary care guidance: diagnosing and managing infections - GOV.UK Date accessed September 14)<br>3. NHS Choices Threadworms (Available at **http://www.nhs.uk/Conditions/Threadworms/Pages/Treatment.aspx** Date accessed 24.7.14) | |



# Skin & Soft Tissue
## Infections

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## Skin & Soft Tissue Infections – Impetigo

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| **When to treat**[1,2] | Although usually self-limiting, treatment is recommended for all cases, as untreated impetigo is highly contagious and there is a risk it may become generalised. Topical antibiotics should be reserved for very localised lesions and oral antibiotics used for extensive, severe or bullous impetigo.<br>Non-bullous impetigo (also known as impetigo contagiosa or crusted impetigo) is the most common form. Lesions begin as vesicles or pustules, which rapidly burst and evolve into gold-crusted plaques. The area around the mouth and nose is most commonly affected.<br>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. | | | |
| **When to investigate**[1] | Skin swabs are not necessary to diagnose impetigo.<br>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.<br>Advise the person to attend a follow-up appointment if there is no significant improvement after 7 days. | | | |
| **How to respond to a positive lab result** | Review any culture results and ensure that an appropriate antibiotic is being used. | | | |
| **General advice**[1] | Advise that hygiene measures are important to aid healing and stop the infection spreading to other sites on the body and to other people. | | | |
| **Treatment choices**[2] | **Small localised infections (topical antibiotics):** | | **More generalized/widespread infections (oral antibiotics):** | |
| | **Fusidic Acid** 2% topically *tds* for 5 days | **If MRSA isolated:**<br>**Mupirocin** 2% topically *tds* to affected area(s) for 5 days | **Flucloxacillin** 500mg *qds* for 7 days | **If penicillin allergic:**<br>**Clarithromycin** 250-500mg *bd* for 7 days |
| **Evidence**[2] | Topical antibiotics are reserved for treatment of very localised lesions because fusidic acid is an antibiotic that is also used systemically and there are concerns that widespread use will lead to increased resistance  If a topical antibiotic is used, a short course (such as 5 days) reduces exposure and the risk of resistance. | | | |
| **References** | 1. CKS (NICE) – Impetigo: **http://cks.nice.org.uk/impetigo#azTab** . Last reviewed July 2013 (Accessed June 2014)<br>2. Management of Infection Guidance for Primary Care; revised Feb 13.<br>**https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Accessed September 2014<br>3. BNF 66, September 2013-March 2014 | | | |

| Skin & Soft Tissue Infections – Eczema | |
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| **When to treat** | If **no visible signs of infection**, use of antibiotics (alone or with steroids) encourages resistance and does not improve healing.<br>In eczema with **visible signs of infection**, use treatment as in impetigo.<br>Admit to hospital urgently if eczema herpeticum (disseminated herpes simplex virus infection) suspected. Signs of eczema herpeticum are:<br>• rapidly worsening, painful eczema;<br>• clustered blisters<br>• punched-out erosions which may coalesce to form larger areas of erosion that can extend over the entire body;<br>• possible fever, lethargy, or distress.<br>Refer urgently (within 2 weeks) to a dermatologist if infected eczema has not responded to treatment<br>Refer to a dermatologist if recurrent secondary bacterial infection. |
| **Evidence**[1] | Oral antibiotics were not associated with benefit in small trials of eczema without visible signs of infection. |
| **References** | 1. Management of Infection Guidance for Primary Care; revised Feb 13 **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Accessed September 2014<br>2. CKS (NICE) – Eczema- Atopic **http://cks.nice.org.uk/eczema-atopic#azTab** Last reviewed March 2013 (Accessed June 2014.)<br>3. NHS Choices – Complications of Atopic Eczema : **http://www.nhs.uk/Conditions/Eczema-(atopic)/Pages/Complications.aspx** (Accessed June 14) |

## Skin & Soft Tissue Infections – Cellulitis

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| **When to treat**[1,2] | Cellulitis presents with an acute onset of red, painful, hot, swollen, and tender skin, with possible blister or bullae formation. The leg is the most commonly affected site, presentation is usually unilateral. Often (but not always) associated with a break in the skin (portal entry).<br>If patient afebrile and healthy other than cellulitis, can be managed in primary care.[2] | | |
| **When to investigate**[1,2] | **If patient febrile and ill, admit for IV treatment**<br>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.<br>*Mild facial cellulitis can be managed in primary care (see treatment below)<br>**If river or sea water exposure, discuss with microbiologist**<br>Consider taking a swab for culture and sensitivity testing if there is a visible portal of entry for bacteria (e.g. an open wound); other investigations are not usually necessary. | | |
| **How to respond to a positive lab result** | Alter treatment in response to culture and sensitivity results of potential pathogens.<br>Refer people who fail to respond to oral antibiotics or have frequent recurrence of cellulitis, for example more than two episodes at the same site.[1] | | |
| **General advice** | Before treatment, draw around the extent of the infection with a permanent marker pen for future comparison.[1]<br>Advise patient to have an adequate fluid intake.[1]<br>Elevation of the affected area speeds improvement by promoting gravity drainage of the oedema/inflammatory substances.[3]<br>In patients with lymphoedema antibiotic prophylaxis should be offered to patients who have two or more attacks of cellulitis per year.[4] | | |
| **Treatment choices**[2] | **First Line:**<br>**Flucloxacillin** 500mg *qds* for 7 days [C] | ***If penicillin allergic:***<br>**Clarithromycin** 500mg *bd* ***OR***<br>**Clindamycin** 300-450mg *qds* for 7 days | **Mild facial cellulitis:**<br>**Co-amoxiclav** 625mg *tds* for 7 days |
| | If slow response continue antibiotics for a **further 7 days**. | | |
| **Cautions** | Stop clindamycin if diarrhoea occurs. | | |
| **Evidence**[2] | Expert consensus that people with no signs of systemic toxicity and no uncontrolled co-morbidities can usually be managed with oral antbiotics. | | |
| **References** | 1. CKS (NICE) – Cellulitis- acute: **http://cks.nice.org.uk/cellulitis-acute#azTab** Last reviewed Sept 2012 (Accessed June 2014):<br>2. Management of Infection Guidance for Primary Care; revised Feb 13. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**<br>3. Infectious Diseases Society of America 2005. Practice Guidelines for the Diagnosis and Management of Skin and Soft-Tissue Infections<br>4. Lymphoedema Framework, 2006. Best practice for the management of lymphoedema. International Consensus. London: MEP Ltd. | | |

## Skin & Soft Tissue Infections – Leg Ulcers

**When to treat**

Signs of an infected leg ulcer include enlarging ulcer with abnormal, bleeding or bridging granulation tissue, increased exudate, increased disproportionate pain, pyrexia, systemic inflammatory response syndrome, sepsis, foul odour or cellulitis, lymphangitis and lymphadenopathy.[1,2,3,8] See local leg ulcer guidelines for full guidance.[2] Leg ulcers are **always** colonised and antibiotics will only promote healing during active infection.[4] If the patient has an active infection, start empirical antibiotics after taking a wound swab for cultures and sensitivity.

**When to investigate**

Ulcers should not routinely be swabbed unless there is clinical evidence of infection Treat the patient, NOT culture results[8]. Take a swab from all infected leg ulcers before prescribing an antibiotic.[1]
Use a swab with transport medium, to aid survival of fastidious organisms. Clean the ulcer with a sterile solution to remove debris, pus or other foreign material first, and gently pass the swab over the area in a zig zag motion ensuring it is turned in a circular motion so that the entire swab is covered. Swab from the centre to the outside of the wound ensuring any exudate is thoroughly absorbed onto the swab. Ensure that a full history is given when sending the swab to the pathology department.[1]

**How to respond to a positive lab result**

Swab results determine organisms present and antimicrobial susceptibilities, they do not determine the presence of infection.[5] Inclusion of antibiotic susceptibilities in a microbiology report does not necessarily mean an organism is significant or that it requires antibiotic treatment Group A ß-haemolytic streptococci can be associated with significant infection and delay healing. Significance of other organisms depends on presence of the clinical criteria above.
Review antibiotics after culture results.[4] Seek microbiology advice if colonised with MRSA.[5]
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 antimicrobial should be considered if the wound is thought to be critically colonised and may be of some benefit as an adjunct to systemic treatment in infected wounds.[2,6]

**General advice**

Advise patients to keep mobile, elevate legs when immobile, avoid trauma and wear appropriate footwear, use an emollient frequently even after the ulcer has healed, examine legs regularly for deterioration and wear compression bandages or stockings as advised.[1]

**Treatment choices[4]**

**First line if evidence of active infection: Flucloxacillin** 500mg-1g (dependant on BMI)[7] *qds* for 7 days. If slow response continue for a further 7 days[C]

***If penicillin allergic:*** **Clarithromycin** 500mg *bd* for 7 days. If slow response continue for a further 7 days[C]

**Evidence**

Available evidence suggests that no differences in complete wound healing were detected when silver-impregnated dressings, povidone iodine or honey-based preparations were compared with non-antimicrobial dressings for venous leg ulcers (see advice from tissue viability specialist).[8]
More research study participants were healed when given cadexomer iodine compared with standard care but cadexomer iodine dressings should only be used when there is evidence of heavy bacterial load/local wound infection and these dressings should be stopped once local infection has been controlled and for no longer than 3 months continuously.[8,9]

**References**


1. C.K.S.Nice – Venous Leg Ulcer **http://cks.nice.org.uk/leg-ulcer-venous** (Accessed April 2014)
2. Southern Health Leg Ulcer Guidelines April 2009. Accessible hyperlink or search for Southern Health Leg Ulcer Guidelines using internet search engine(Accessed April 2014)
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.mepltd.co.uk** (direct link PHE & BIA, Jan 2012. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**
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7. SIGN Management of Chronic Venous Leg Ulcers a national clinical guideline 120. August 2010 Available from: **http://www.sign.ac.uk/pdf/sign120.pdf**
8. O'Meara S, Al-Kurdi D, Ologun Y, Ovington LG,Martyn-St JamesM, Richardson R. Antibiotics and antiseptics for venous leg ulcers. Cochrane Database of Systematic Reviews 2014, Issue 1. Art. No.: CD003557. DOI: 10.1002/14651858.CD003557.pub5.
9. Australian and New Zealand Clinical Practice Guideline for Prevention and Management of Venous Leg Ulcers. **http://www.awma.com.au/publications/#vlug**

## Skin & Soft Tissue Infections – Diabetic Foot Ulcer

### When to treat

- Antibiotics should not be used for foot ulcers without signs of infection as they do not enhance healing or prevent infection.[1,6]
- The clinical diagnosis of foot infection is based on ≥ two of the following: purulent discharge from an ulcer or signs of inflammation (i.e. erythema, pain, tenderness, warmth or induration).[2] Other signs may include foul odour, nonpurulent secretions, friable or discoloured granulation tissue, undermining of wound edges.[2]
- Ideally refer anyone with new diabetic foot infection to a multidisciplinary foot-care team within 24 hours.[2,3,5] If this is not possible and the infection is superficial and non-limb-threatening, consider taking swabs then start empirical antibiotic treatment.[3]
- Mild infections are those where the cellulitis or erythema extends > 0.5cm but ≤ 2cm around the ulcer, and infection is limited to the skin or superficial subcutaneous tissues and there are no other local complications or systemic illness.[2]
- Moderate infections (erythema > 2cm, or involving structures deeper than skin and subcutaneous tissues eg, abscess, fasciitis; and no systemic inflammatory response signs – SIRS) should be referred for inpatient management in the presence of complications e.g. severe peripheral arterial disease.[2]
- If the infection is severe (> 2 SIRS criteria), refer for urgent inpatient management.[2,3] 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; 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.[2,3] Ensure that the person is reviewed within 48 hours.[3]

### How to respond to a positive lab result

Patients should be reassessed 24 to 72 hours after initiating empiric antibiotic therapy to evaluate their response and modify the antibiotic regimen, if indicated by early culture results.[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

#### • Mild infection

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| **First Line:**[3] **Flucloxacillin** 500mg *qds* for 7 days<br>***If penicillin allergic:*** **Clarithromycin** 500mg *bd* for 7days | **If known to be infected/colonised with MRSA within the last year:**[2,6]<br>**Doxycycline** 100mg *bd* for 7 days |

Consider adding **Metronidazole** 400mg *tds* to cover anaerobes (e.g. if foul odour).[4]

#### • Moderate infection[7] without complications

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| **First Line: *Co-amoxiclav** 625mg *tds* for 7-14days<br>***If penicillin allergic:*** ***Clindamycin** 450mg *qds* for 7-14days<br>***PLUS*** ***Moxifloxacin** 400mg *bd* for 7-14days | **If known to be infected/colonised with MRSA within the last year:**<br>seek advice from a Microbiologist as may require inpatient management |

### Evidence

Consider continuing antibiotics for a further 7 days depending on severity of infection and speed of response to treatment.[2,3]
Continue antibiotic therapy until the infection has resolved but not necessarily until a wound has healed.[2]
Several antibiotics have been shown to be effective, but no single regimen has shown superiority.[1]

### References


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

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| **When to treat** | For **MRSA colonisation**, prescribe suppression regimen for all patients with positive cultures awaiting elective procedures.[1]<br>Consider treating patients with **active MRSA infection** that has been confirmed by laboratory tests.[2] Do not give systemic antibiotics to patients with minor skin and soft tissue infections or small abscesses (<5 cm). Incise and drain small abscesses without cellulitis and do not give antibiotic therapy.[3]<br>MRSA infections most commonly affect the skin presenting as boils; abscesses; styes; carbuncles; cellulitis; impetigo; wound infections.[4] If MRSA enters the blood stream it can affect almost any part of the body.[4] Consider admitting people who are MRSA positive if they have worsening signs of infection (e.g. sepsis, worsening cellulitis, fever, or tachycardia), particularly if they are likely to require parenteral antibiotic therapy and/or surgical drainage.[4] | |
| **When to investigate** | **Screening for colonisation:** GPs or pre-admission clinics should screen all patients awaiting elective admissions.[1] Local or national exceptions may apply. Swabs should be taken from the nose and any skin lesions or wounds.[1] The swab should be wiped around the inside of the patient's nose for 5 seconds.[1]<br>**Diagnosing active infection:** Swab for pathogens including MRSA, or obtain a specimen if appropriate, if the person has an active infection and one or more of the following risk factors: elderly or debilitated people with critical or chronic illness; surgical wounds, open ulcers, intravenous lines, or catheter lines; infected pressure sore; history of MRSA colonisation or infection; recent surgery; recent hospital discharge; regular nursing home contact or a nursing home resident; recent antibiotic use (especially cephalosporins, fluoroquinolones, and macrolides); dialysis; permanent urinary catheter.[4]<br>**Panton-Valentine Leukocidin (PVL)** is a toxin produced by 2% of *S. aureus*. It can rarely cause severe invasive infections in healthy people. Send swabs if **recurrent boils/abscesses**. At risk: close contact in communities or sport; poor hygiene.[2C] | |
| **How to respond to a positive lab result** | Suppression of colonisation should take place within the 5 days prior to operation as it may not be successful in the long term.[1] For active MRSA infection use antibiotic sensitivities to guide treatment.[2] If severe infection or no response to monotherapy after 24-48 hours, seek advice from microbiologist on combination therapy and use of Linezolid.[2] | |
| **Treatment choices** | **SUPPRESSION:**[1] Treat underlying skin conditions (e.g. eczema), remove and/or replace invasive devices and treat skin breaks.<br>**Use both nasal and skin regimens:** | |
| | **Nasal: Naseptin** nasal cream *qds* for 10 days<br>***OR*** (if allergic to peanut, soya or chlorhexidine)<br>2% **Mupirocin** in paraffin base tds for 5 days[A] | **Skin:** 4% **Chlorhexidine gluconate** body-wash/shampoo daily for 5 days<br>Alternatives: 7.5% **povidone iodine** or 2% **Triclosan** daily for 5 days |
| | **ACTIVE TREATMENT:**[2] for MRSA confirmed by lab results: **Doxycycline** alone[B+] 100mg *bd* for 7 days **OR Trimethoprim** 200mg *bd* for 7 days | |
| **Cautions** | *High-risk drug for *C. difficile* infection and should be avoided in at-risk patients. Stop clindamycin if diarrhoea occurs.[2] | |
| **References** | 1. Health Protection Agency 2009 MRSA screening and suppression **https://www.gov.uk/government/publications/meticillin-resistant-staphylococcus-aureus-mrsa-screening-and-suppression-guidance-for-primary-care** Accessed September 2014<br>2. Management of Infection Guidance for Primary Care, HPA & BIA,April 2014. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections**<br>3. British Society for Antimicrobial Chemotherapy 2008. Guidelines for UK practice for the diagnosis and management of MRSA infections presenting in community<br>4. Clinical knowledge summaries **http://cks.nice.org.uk/mrsa-in-primary-care** Accessed September 2014 | |

| Skin & Soft Tissue Infections – Animal Bite | | |
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| **When to treat**[1,2] | Prescribe prophylactic antibiotics if the wound is less than 48 hours old, and there is a high infection risk*. Antibiotics are not usually needed if the wound is more than 48 hours old and there is no sign of local or systemic infection<br>**High Infection risk:* bite to the hand, foot, and face; puncture wounds; all cat bites; wounds requiring surgical debridement; wounds involving joints, tendons, ligaments, or suspected fractures; wounds that have undergone primary closure; wounds to people who are at risk of serious wound infection (e.g. those who are diabetic, cirrhotic, asplenic, immunosuppressed, people with a prosthetic valve or a prosthetic joint)<br>Refer to A&E for further assessment and management if wound closure is necessary.<br>Admit anyone who has severe infection or who is systemically unwell as IV antibiotics may be required<br>**Assess risk of tetanus and rabies.** If any risk of rabies contact the Local Health protection Team (Public Health England): **https://www.gov.uk/contacts-phe-regions-and-local-centres**). | |
| **When to investigate**[1] | Where infection suspected, send a pus or deep wound swab for culture before cleaning the wound and starting antibiotics (state on form that swab is from an infected animal bite).<br>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 to ensure that infection is responding to treatment (particularly for penicillin allergic regimens – see below). | |
| **How to respond to a positive lab result** | Alter treatment in response to culture and sensitivity results.<br>For bites from animals not covered in this guidance, seek microbiology advice for the most appropriate treatment. | |
| **General advice**[1] | If the wound has just occurred, remove any foreign bodies from the wound and encourage it to bleed. Clean and irrigate the wound. | |
| **Treatment choices**[2] | **Cat or Dog bite first line prophylaxis or treatment:**<br>**Co-amoxiclav** 375-625mg *tds* for 7 days | **Cat or Dog bite prophylaxis or treatment *if penicillin allergic:***<br>**Metronidazole** 200-400mg *tds* ***PLUS*** **Doxycycline** 100mg *bd* for 7 days |
| | *Penicillin allergy: reassess at 24 and 48 hours after starting a course of antibiotic treatment because the recommended regimen (above) covers the majority, but not all, of the likely pathogens from an animal bite* | |
| **Cautions** | Antiseptic cleansers are not necessary, and there is some concern that they damage tissue and delay wound healing. | |
| **Evidence** | Co-amoxiclav recommended first line for treatment or prophylaxis of animal bites because it is a broad-spectrum antibiotic that is effective against the most commonly isolated organisms from animal bites (including *Pasteurella*). Macrolides are not recommended for animal bites because they do not adequately cover *Pasteurella*. | |
| **References** | 1. CKS – Bites – human and animal: **http://cks.nice.org.uk/bites-human-and-animal#azTab** Last reviewed Jan 2012 (Accessed June 2014)<br>2. Management of Infection Guidance for Primary Care; revised Feb 13. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Accessed September 2014 | |

| Skin & Soft Tissue Infections – Human Bite | | |
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| **When to treat**[1,2] | Prescribe prophylactic antibiotics for all human bite wounds less than 72 hours old, even if there is no sign of infection.<br>Refer to A&E for further assessment and management if wound closure is necessary.<br>Admit anyone who has severe infection or who is systemically unwell as IV antibiotics may be required.<br>**Assess risk of tetanus, HIV, Hepatitis B&C:** Seek immediate advice from a consultant in microbiology or infectious diseases for anyone considered to be at risk of HIV, hepatitis B or C. Consider all people to be at risk unless the current status of the biter is known (rare).<br>Consider if tetanus prophylaxis is required. | |
| **When to investigate**[1] | Where infection suspected, send a pus or deep wound swab for culture before cleaning the wound and starting antibiotics (state on form that swab is from an infected human bite.<br>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 to ensure that infection is responding to treatment (particularly for penicillin allergic regimens – see below). | |
| **How to respond to a positive lab result** | Alter treatment in response to culture and sensitivity results. | |
| **General advice**[1] | If the wound has just occurred remove any foreign bodies from the wound and encourage it to bleed. Clean and irrigate the wound thoroughly with warm running water. | |
| **Treatment choices**[2] | **Prophylaxis or treatment:**<br>**Co-amoxiclav** 375-625mg *tds* for 7 days | ***Prophylaxis or treatment if penicillin allergic:***<br>**Metronidazole** 200-400mg *tds* ***PLUS*** **Doxycycline** 100mg *bd* for 7 days<br>***OR*** **Metronidazole** 200-400mg *tds* ***PLUS*** **Clarithromycin** 250-500mg *bd* for 7 days |
| | *Penicillin allergy: reassess at 24 and 48 hours after starting a course of antibiotic treatment because the recommended regimen (above) covers the majority, but not all, of the likely pathogens from a human bite* | |
| **Cautions** | Antiseptic cleansers are not necessary and there is some concern that they damage tissue and delay wound healing. | |
| **Evidence**[2] | Co-amoxiclav recommended first line for treatment or prophylaxis of human bites because it is a broad-spectrum antibiotic that is effective against the most commonly isolated organisms from human bites.<br>Doxycycline, but not clarithromycin is active against *Eikenella* species, which is commonly isolated from human mouths. | |
| **References** | 1. CKS – Bites – human and animal: **http://cks.nice.org.uk/bites-human-and-animal#azTab** Last reviewed Jan 2012 (Accessed June 2014)<br>2. Management of Infection Guidance for Primary Care; revised Feb 13<br>**https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** | |

| Skin & Soft Tissue Infections – Scabies | | |
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| **When to treat** | The main symptom is generalised itch – especially at night. Characteristic silvery lines may be seen in the skin where mites have burrowed. Erythematous papular or vesicular lesions are often associated with the burrows.[1] Typical sites include the interdigital folds, wrists, elbows and around the nipples in women.[2]<br>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]<br>Treat scabies that has become infected with an antibiotic.[1] Scabies is rare in children under 2 months of age. Seek specialist advice (e.g. from a paediatric dermatologist) if treatment is required for this age group.[1] | |
| **When to investigate** | Finding the mite or its products confirms, but is not necessary for making a diagnosis of scabies.[1] Review if symptoms have not cleared within 6 weeks after the first application of treatment.[1] Refer institutionalised outbreaks of scabies (e.g. schools, long-stay nursing homes) to the PHE.[1] | |
| **Treatment choices** | **Permethrin**[A+] 5% cream. Apply as described below, in two applications, 7 days apart.[3] Wash off after 8-12 hours.[1] | ***If allergy:*** **Malathion**[C] 0.5% aqueous liquid. Apply as described below, in two applications, 7 days apart.[3] Wash off after 24 hours.[1] |
| | Apply the treatment to the whole body 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] | |
| **General advice** | Itch may persist for several weeks.[1] Consider symptomatic treatment for itching (e.g. crotamiton 10% cream).[1]<br>Machine wash (at 50°C or above) clothes, towels, and bed linen, on the day of application of the first treatment.[1]<br>If recurrence occurs where all contacts were treated simultaneously and treatment was applied correctly, give a course of a different insecticide.[1] | |
| **Evidence** | There is more evidence for the effectiveness of permethrin than malathion.[1]<br>Benzyl benzoate is regarded as too irritant, and crotamiton is ineffective compared to the recommended options.[2]<br>Crusted scabies usually only occurs in people who are immunocompromised or who have other risk factors and does not present in the same way as classic scabies.[1] There are hyperkeratotic, warty crusts, which are usually on the hands and feet but all areas of the skin may be involved.[1] Seek specialist advice from a consultant dermatologist for the management of anyone presenting with crusted scabies; admission may be required.[1] | |
| **References** | 1. Clincal knowledge summaries – Scabies **http://cks.nice.org.uk/search?q=scabies** (Accessed July 2014)<br>2. British Association of Sexual Health and HIV 2010 United Kingdom National Guideline on the Management of Scabies infestation. **http://www.bashh.org/guidelines**<br>3. Management of Infection Guidance for Primary Care, PHE & BIA, Apr 2014.<br>**https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** | |

## Skin & Soft Tissue Infections – Fungal Infection – Skin

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| **When to treat** | Treat fungal skin infections with topical or oral antifungals depending on their severity and location (see below).[1]<br>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]<br>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]<br>Scrape skin from the advancing edge of lesion. Use a blunt scalpel blade or similar. 5mm$^2$ of skin flakes are needed for microscopy and culture. Do not refrigerate.[2] | | |
| **How to respond to a positive lab result** | Treat if positive lab cultures. Susceptibility testing of dermatophytes is not required, as antifungal resistance is unusual and there is no known correlation between antifungal susceptibilities and outcome.[2]<br>For non-dermatophyte moulds other than Candida 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** | **Dermatophyte infection:**<br>***Skin or foot:***[2]<br>Topical 1% **Terbinafine**[A+] *od - bd* for 7-14 days [A+]<br>***Groin or foot:***[2]<br>Use a 1% Azole cream *od - bd* for 4-6 weeks<br>*Alternative for* ***foot*** *only:*[3]<br>**Topical Undecanoates** (Mycota®)[B+] *bd* continued for 1-2 weeks after healing | **Candida infection:**<br>**Azole** cream 1% *od - bd* continued for 1-2 weeks after healing[1] | **If intractable, send skin scrapings before starting oral treatment:**[3]<br>**Terbinafine** 250mg oral *od*[4]<br>***Skin:*** 4 weeks ***Groin:*** 2-4 weeks ***Foot:*** 2-6 weeks[4]<br>***OR*** **Itraconazole**[4]*<br>***Skin or groin:*** either 100mg oral daily for 15 days,<br>or 200mg *od* for 7 days[4]<br>***Foot:*** either 100mg oral once daily for 30 days<br>or 200mg twice daily for 7 days[4] |
| **Cautions** | *Following reports of heart failure, caution is advised when prescribing itraconazole to patients at high risk of heart failure.[4]<br>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-]<br>A Cochrane review found little difference between terbinafine and azoles in standard courses at 2 weeks after baseline however at 6 weeks, treatment failure was lower with terbinafine.[3] | | |
| **References** | 1. Clinical Knowledge Summaries **http://cks.nice.org.uk/fungal-skin-infection-body-and-groin#!scenario** accessed July 2014<br>2. PHE Fungal skin and nail infections 2011. **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/345389/Fungal_infection_quick_reference_guide.pdf**<br>3. Management of Infection Guidance for Primary Care, PHE & BIA. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** (accessed September 2014)<br>4. BNF 66, July 2014. | | |

| Skin & Soft Tissue Infections – Fungal Infection – Fingernail or Toenail | | | |
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| **When to treat** | Start therapy only if infection is confirmed by laboratory.[1C] Only 50% of nail dystrophy are fungal.[2]<br>Self-care alone may be appropriate for people who are not bothered by the infected nail or who wish to avoid the possible adverse effects of drug treatment.[3] | | |
| **When to investigate** | Always send samples before starting lengthy treatment.[1] Send specimens of nail clippings or scrapings for fungal microscopy and culture.[3] False-negative rates are high (about 30%).[3] Therefore repeat the test if the result is negative, and there is high clinical suspicion that the nail is infected.[3] | | |
| **How to respond to a positive lab result** | For infections with dermatophytes use oral terbinafine or intraconazole.[4]<br>Terbinafine is more effective than azoles.[4A+]<br>If candida or non-dermatophyte infection confirmed, use oral itraconazole.[4B+] | | |
| **General advice** | Liver reactions rare with oral antifungals.[4A+]<br>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 choices[4]** | **Superficial only:**<br>**Amorolfine** 5% nail lacquer [B-] 1-2x / weekly<br>***Fingernails:*** 6 months<br>***Toenails:*** 12 months | **First line:**<br>**Terbinafine**[A+] 250mg oral *od*<br>***Fingernails:*** 6-12 weeks<br>***Toenails:*** 3-6 months | **Second line:**<br>**Itraconazole**[A+] 200mg oral *bd* for 7 days each month.<br>***Fingernails:*** 2 courses<br>***Toenails:*** 3 courses |
| **Evidence** | Treatment does not always cure the infection.[3] Cure rates range between approximately 60–80%.[3]<br>The PHE Mycology Reference Laboratory recommends itraconazole for non-dermatophyte infections because although some of the infecting organisms are not particularly susceptible to this agent in vitro, it does reach high concentrations in nail tissue. It can be given as a pulse therapy regimen rather than continuous treatment.[4] | | |
| **References** | 1. PHE Fungal skin and nail infections 2011. **https://www.gov.uk/government/publications/fungal-skin-and-nail-infections-diagnosis-and-laboratory-investigation** (Accessed September 2014)<br>2. Roberts DT, Taylor WD, Boyle J. Guidelines for treatment of onychomycosis. British Journal of Dermatology 2003;148:402-410<br>3. Clinical Knowledge Summaries – Fungal Nail Infection **http://cks.nice.org.uk/fungal-nail-infection#!scenario Accessed** July 2014<br>4. Management of Infection Guidance for Primary Care,PHE & BIA. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** (accessed September 2014) | | |

| Skin & Soft Tissue Infections – Varicella Zoster (chicken pox), Herpes Zoster (shingles) & Cold Sores | | |
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| **When to treat** | For chicken pox and shingles: Pregnant/immunocompromised/neonate: Seek urgent specialist advice.[1B+]<br>**Chicken pox**: If started <24h of rash onset & >14 years old or severe pain, dense/oral rash, 2º 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]<br>**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]<br>**Cold sore:** Resolve after 7-10d without treatment. Topical antivirals applied prodromally reduce duration by 12-24hrs.[1] | |
| **When to test** | **Chicken pox:** Laboratory tests can be used for confirmation but are rarely required.[3]<br>**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] | |
| **General advice** | Prescribe appropriate analgesia where necessary.[2,3] | |
| **Treatment choices** | **First line chicken pox/shingles:**<br>**Aciclovir**[A+] 800mg five times a day for 7 days[1B+]<br>**Cold sore:**<br>**Topical Aciclovir** 5% 4-hourly for 5-10 days[4] | ***Second line for shingles if compliance a problem (as more expensive)***[1]<br>**Valaciclovir**[B+] 1g *tds* 7 days[B+]<br>***OR***<br>**Famciclovir**[B+] 250mg *tds* 7 days[B+] |
| **Evidence**[1] | Evidence from RCTs supports treatment for all those over 50 years to prevent the incidence of post-herpetic neuralgia.<br>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. | |
| **References** | 1. Management of Infection Guidance for Primary Care,PHE & BIA. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** (accessed September 2014)<br>2. Clinical Knowledge Summaries – Shingles **http://cks.nice.org.uk/shingles#!management** (Accessed July 2014)<br>3. Clinical Knowledge Summaries – Chickenpox **http://cks.nice.org.uk/chickenpox#!management** (Accessed July 2014)<br>4. BNF 66, July 2014. | |

## Skin & Soft Tissue Infections – Acne vulgaris

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| **When to treat**[1] | **Mild acne:** Predominantly consists of non-inflammatory comedones (open and closed)<br>**Moderate acne:** Consists of a mixture of non-inflammatory comedones and predominating inflammatory papules and pustules.<br>**Severe acne:** Characterized by presence of widespread nodules and cysts together with preponderance of papules and pustules.<br>Complications include scarring, (although rare in mild acne), psychological problems and hyperpigmentation. Treatment should be started early to avoid scarring. | |
| **When to investigate**[1] | • Refer to psychiatry people who have severe psychosocial problems, including a morbid fear of deformity<br>• Refer to dermatology:1) Severe acne: urgently people with severe variant with systemic symptoms (i.e. acne fulminans), refer (soon) all other people 2) Moderate acne: features that make the diagnosis uncertain; those at risk of developing scarring despite treatment; acne that has failed to respond adequately to treatment (over a period of at least 6 months).<br>• Refer to endocrinology or gynaecology, women suspected of having an underlying endocrinological cause of acne. | |
| **General advice**[1] | Advise not to wash more than twice a day, use a mild soap or cleanser and lukewarm water, not to use vigorous scrubbing when washing acne-affected skin and not to attempt to 'clean' blackheads. Treatments are effective but take time to work (typically 8 - 12 weeks) and may irritate the skin, especially at the start of treatment. | |
| **Treatment choices**[1] | **Topical Treatment**<br>***Mild/moderate:*** **First line: Topical Retinoid *OR* Benzoyl Peroxide**<br>**Second line: Azelaic Acid**<br>***Moderate acne (at risk of scarring):*** **Topical antibiotic *PLUS* Benzoyl Peroxide *OR* Topical Retinoid** | ***Moderate (if extensive/significant risk of scarring)/ severe(awaiting referral):***<br>**First line: (Oxy)tetracycline** 500mg *bd*<br>**Second line: Lymecycline** 408mg *od* ***OR***<br>**Doxycycline** 100mg od<br>**Alternative regimen: Erythromycin** 500mg *bd*<br>***PLUS*** **Topical Retinoid OR Benzoyl Peroxide** |
| | **Treatment notes:** ***Oral antibiotics:*** follow up at 6-8 weeks: i) Good response- continue for additional 4-6 months (consider halving dose for latter half of treatment period) then stop ii) Inadequate response- Continue for a minimum of 3 months before assuming treatment ineffective (consider referral at this stage). Continue topical treatment after stopping oral antibiotic; also consider combination of topical retinoid plus benzoyl peroxide (though may be poorly tolerated). Do not use oral antibiotic treatment alone. Do not combine topical and oral antibiotic treatments. Topical antibiotics should be limited to 12 weeks treatment where possible. Topical retinoids are contraindicated in pregnancy | |
| | Consider prescribing a standard combined oral contraceptive or co-cyprindiol (Dianette) for women who require contraception. | |
| **Evidence**[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. A Cochrane review has found minocycline not to be superior to other commonly used therapies and there are concerns about its safety; and lymecycline was not found to be superior to minocycline (Garner SE et al 2012). | |
| **References** | 1. CKS (NICE) – Acne vulgaris **http://cks.nice.org.uk/acne-vulgaris#azTab**. Last reviewed July 2013 (Accessed June 2014)<br>2. What role for topical antibacterials in acne? Drug and Therapeutics Bulletin 2010 ; 48 : 141-144<br>3. **http://www.ncbi.nlm.nih.gov/pubmed/22895927** | |

| Skin & Soft Tissue Infections – Surgical Site Infection (SSI) | | |
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| **When to treat** | Any SSI may cause redness, delayed healing, fever, pain, tenderness, warmth, or swelling. These are the additional signs and symptoms for specific types of SSI:<br>• A superficial incisional SSI may produce purulent discharge from the wound site but may not need antibiotic treatment.<br>• A deep incisional SSI may also produce pus. The wound site may reopen on its own.<br>• An organ or space SSI may show a discharge of pus coming from a drain placed through the skin into a body space or organ(abscess).[1,2,3] | |
| **General advice** | Not all SSIs require antibiotic treatment: minor infections may respond to drainage of pus (for example, by removal of sutures) and topical antisepsis. Antibiotic therapy carries with it the risk of adverse drug reactions and the development of resistant bacteria with the associated risk of *C. difficile* diarrhoea.[2]<br>Send culture to microbiology. | |
| **Treatment choices** | **First line:**<br>**Flucloxacillin** 500mg *qds* for 7 days<br>If clean/contaminated surgery involving mucosal surfaces:<br>**Metronidazole** 400mg *tds* for 7 days[4] ***AND/OR***<br>**Co-Amoxiclav** 500/125 *tds* for 7 days[4] | **At risk of MRSA:**<br>**Rifampicin** 300mg *bd*<br>***PLUS***<br>**Doxycycline**[B+] 100mg *bd* for 7 days ***OR***<br>**Clindamycin***[B+] 450mg *qds* for 7 days alone |
| **References** | 1. NICE clinical guideline 74 – Surgical site infection **http://www.nice.org.uk/nicemedia/pdf/CG74NICEGuideline.pdf**<br>2. **http://www.ncbi.nlm.nih.gov/books/NBK53739/**<br>3. Health Protection Agency 2009 MRSA screening and suppression.<br>**https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** (Accessed September 2014)<br>4. BNF June 14 | |

## Skin & Soft Tissue Infections – Scarlet Fever (Scarletina)

**When to treat[2]**

Prompt treatment with antibiotics significantly reduces complications such as an ear infection, throat abscess (quinsy), pneumonia, sinusitis or meningitis in the early stages and acute glomerulonephritis and acute rheumatic fever at a later stage.

Symptoms include:

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

**When to admit[1]**

- Have pre-existing valvular disease
- Are significantly immunocompromised (for example with clinically-apparent HIV infection).
- Have a severe complication of scarlet fever (for example evidence of acute rheumatic fever or an invasive suppurative complication).
- Have a severe form of scarlet fever, such as 'septic' or 'toxic' scarlet fever (characterized by high fever and marked systemic toxicity, possibly including arthritis and jaundice).

**General advice[1]**

Scarlet fever is a notifiable infectious disease caused by a particular strain of the group A streptococcus bacterium (*Streptococcus pyogenes*). Scarlet fever is characterised by a rash, which usually accompanies a sore throat, and is sometimes confused with the measles' rash. The bacteria which cause the infection produce toxins (poisons), which cause a rash, a red and swollen tongue and flushed cheeks.[2] The primary site of infection with *S. pyogenes* is usually the throat, where it causes symptoms of pharyngitis. In rare circumstances, scarlet fever can also originate from other sites (for example an infected wound).[1] Reassure the person that scarlet fever is no longer a serious condition and that symptoms usually last for 1 week.

Advise the person to: stay away from school or work for 1 day after starting antibiotic treatment, wash their hands frequently, avoid sharing eating utensils and towels, dispose of handkerchiefs promptly, and avoid contact with anyone at particular risk of infection (e.g. people with valvular disease or who are immunocompromised). Offer Ibuprofen or paracetamol for symptom relief. Encourage the person to rest and drink adequate fluids.

Advise to return for follow up if symptoms have not improved or have worsened after 7 days.

**Treatment choices**

**First line:**

**Phenoxymethylpenicillin**

500mg every 6 hours, increased up to 1g every 6 hours if necessary;

**Child up to 1 year:** 62.5mg every 6 hours, increased up to 12.5mg/kg every 6 hours if necessary;

**1-6 years:** 125mg every 6 hours, increased up to 12.5mg/kg every 6 hours if necessary

**6-12 years:** 250mg every 6 hours, increased up to 12.5mg/kg every 6 hours if necessary[3]

**Second line *(if allergic to penicillin)*:**

**Erythromycin** (doses may be doubled in severe infection):

**Adult and child over 8 years:** 250-500mg every 6 hours ***OR*** 0.5-1g every 12 hours;

**Child 1 month-2 years:** 125mg every 6 hours ***OR*** 250mg every 12 hours,

**2-8 years:** 250mg every 6 hours ***OR*** 500mg every 12 hours.

***OR* Clarithromycin** (doses may be doubled in severe infection)

**Adult and child over 12 years:** 250mg every 12 hours.

**Child body-weight under 8kg:** 7.5mg/kg twice daily;

**8-11kg:** 62.5mg twice daily; **12-19kg:** 125mg twice daily;

**20-29kg:** 187.5mg twice daily; **30-40kg:** 250mg twice daily[3]

**References**


1. CKS NICE/Scarlet Fever **http://cks.nice.org.uk/scarlet-fever#!topicsummary** Accessed July 2014
2. Interim_guidelines_for_scarlet_fever_outbreaks_in_schools_and_nurseriesFINAL2.pdf **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/322727/PHE** Accessed September 2014
3. BNF July 14 **https://www.medicinescomplete.com/mc/bnf/current/PHP3310-phenoxymethylpenicillin.htm**

# **Eye**
## Infections

## Eye infections – Infective Conjunctivitis

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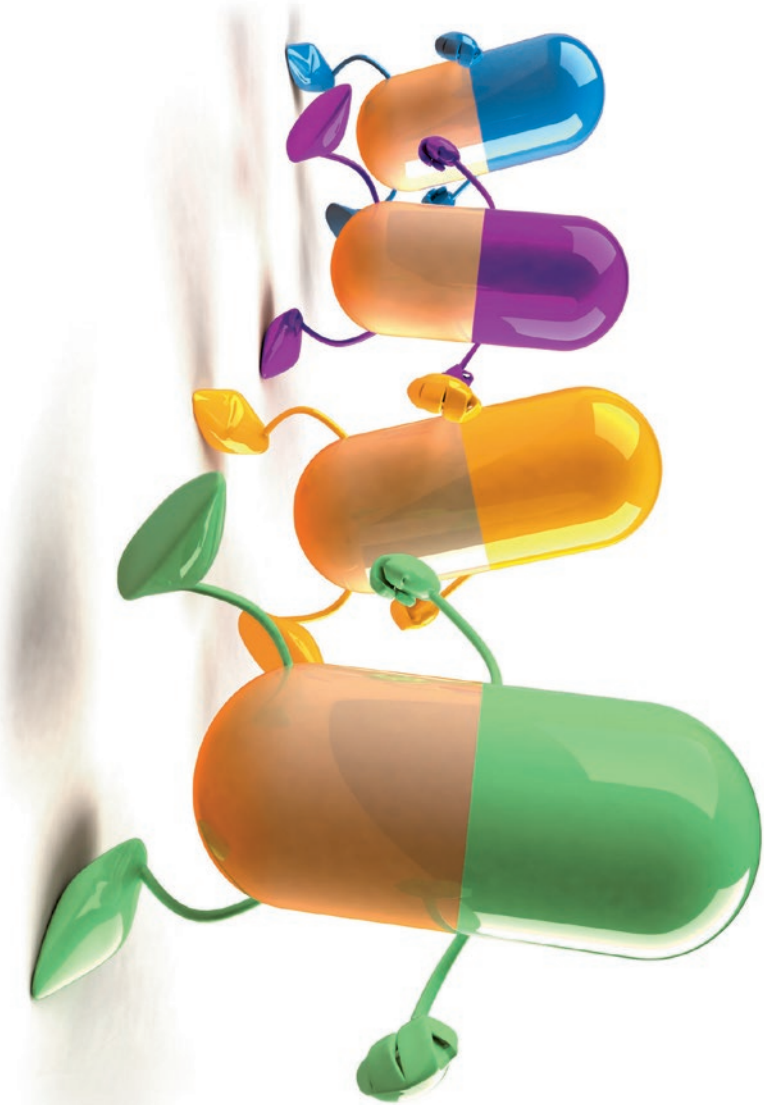
| **When to treat** | Acute infective conjunctivitis may affect one or both eyes. It usually presents with eye irritation or a vague foreign body sensation accompanied by tear production, discharge (which may stick the eyelids together upon waking) and red eye.[1]<br>Infective conjunctivitis may be viral or bacterial – it is difficult to clinically distinguish between the two.[1]<br>Acute infective conjunctivitis is usually self-limiting therefore a 'wait and see' or delayed prescribing approach is likely to be most appropriate.[1]<br>Consider starting treatment if no improvement after 3 days.[1]<br>Consider offering a topical antibiotic if the conjunctivitis is severe (consider to be severe when the person considers the symptoms to be distressing or the signs are judged to be severe from clinical experience).[2]<br>Clinical resolution occurs within 2-5 days in 65% of confirmed bacterial conjunctivitis cases treated with placebo.[1] | |
| **When to investigate** | If any of the following symptoms are present, refer the patient for specialist same-day assessment to exclude acute glaucoma, keratitis, iritis or orbital cellulitis: Significant photophobia; reduced visual acuity; pain deep in the eye; recent eye surgery; absent or sluggish pupil response; irregular pupils; corneal damage or opacity on fluorescein staining; restricted or painful eye movements; history of head/eye trauma.[1]<br>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]<br>Patients should be advised to seek medical advice if symptoms do not settle within 7 days, or if there is visual disturbance, significant eyelid swelling, photophobia or pain in the eye.[1] | |
| **Treatment choices** | **First line:**<br>**Chloramphenicol**[B+] 0.5% drop 2-hourly for 2 days then 4-hourly (whilst awake). Add 1% ointment at night for severe infections or if slow to respond[D] (incurs additional prescription charge). Continue for 48h after symptom resolution. | **Second line:**<br>**Fusidic acid** 1% gel *bd*[B-]<br>Continue for 48h after symptom resolution |
| **General advice** | Self-management: Bathe eyes with tepid water, wiping away from the bridge of the nose to the side. Avoid contact lenses until symptoms have cleared. Exercise hand hygiene and avoid sharing towels or pillows.[1] | |
| **Evidence** | Fusidic acid has less Gram-negative activity than chloramphenicol.[3]<br>A double-blind placebo-controlled RCT in children showed, at day 7, 83% clinical cure with placebo compared with 86% with chloramphenicol.[4]<br>Minimum difference in duration of moderate symptoms was observed between patients given immediate and treatment delayed by 3 days.[5]<br>Delayed prescribing of antibiotics appears to reduce antibiotic use (almost 50%) with similar symptom control to immediate prescribing.[5] | |
| **References** | 1. Management of acute infective conjunctivitis. Drug and Therapeutics Bulletin 2011; 49(7): 78-80<br>2. **http://cks.nice.org.uk/conjunctivitis-infective#!references/A31179** (last accessed May 2014)<br>3. Management of Infection Guidance for Primary Care, PHE & BIA, Jan 2012<br>**https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Accessed September 2014<br>4. Rose PW et al. Chloramphenicol treatment for acute infective conjunctivitis in children in primary care. The Lancet 2005; 366(8479): 37-43<br>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 | |



# **Dental**
# Infections

## Dental Infections – Mucosal Ulceration and Inflammation (Simple Gingivitis)

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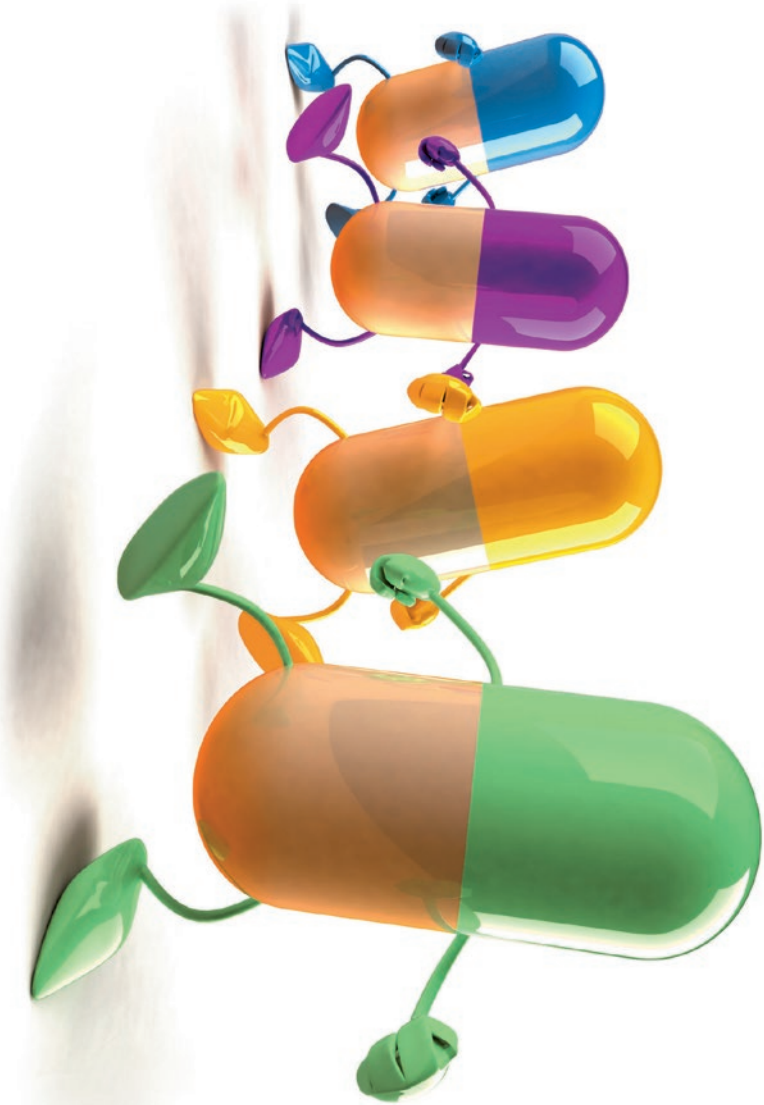
|---|---|---|---|
| **When to treat**[1] | Where possible manage precipitating factors.<br>Offer symptomatic treatment for pain, discomfort, and swelling, especially when ulcers are causing problems with eating.<br>If ulcers are infrequent, mild, and not interfering with daily activities (for example eating), treatment may not be needed. | | |
| **When to refer**[1] | Referral is recommended for people with a suspected underlying cause of aphthous-like ulceration, to identify and manage any underlying disease.<br>**Refer urgently anyone with:**<br>Unexplained ulceration of the oral mucosa or mass persisting for more than 3 weeks.<br>Unexplained red and white patches (including suspected lichen planus) of the mucosa which 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.<br>**Make a non-urgent referral for anyone with:**<br>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<br>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]<br>Use antiseptic mouthwash if more severe pain limits oral hygiene or to prevent secondary infection.[1] | | |
| **Treatment choices**[3] | **Simple saline mouthwash**<br>½ tsp salt dissolved in glass warm water | **Chlorhexidine 0.2% mouthwash**<br>(Do not use within 30mins of toothpaste)<br>Rinse mouth with 10ml for 1 minute *bd*.<br>Can be diluted 1:1 with water with no loss in efficacy. | **Hydrogen peroxide mouthwash 6%**<br>Rinse mouth for 2-3 minutes with 15ml diluted in half a glass of warm water *tds*. |
| | **Spit out mouthwash after rinsing.** Use until lesions have resolved or less pain allows oral hygiene.[3] | | |
| **Evidence**[1] | 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** | 1. CKS Clinical Knowledge Summaries – Aphthous Ulcer **http://cks.nice.org.uk/aphthous-ulcer** (Accessed May 2014)<br>2. BNF 67, March 2014<br>3. Scottish Dental Clinical Effectiveness Programme Drug Prescribing For Dentistry 2011 **http://www.sdcep.org.uk/** (Accessed May 2014) | | |

| Dental Infections – Acute Necrotising Ulcerative Gingivitis (ANG) and Pericoronitis (PC) | | |
|---|---|---|
| **When to treat** | Professional scaling and polishing, root surface instrumentation, and sometimes surgical procedures, are required.[1]<br>**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]<br>Commence antibiotics and refer urgently to dentist for scaling and oral hygiene advice.[1]<br>**PC:** Refer to dentist urgently for irrigation and debridement.[2] Antibacterial treatment required only in presence of systemic features of infection, or of triasmus or persistent swelling despite local treatment.[2,3] | |
| **General advice[2]** | During the acute phase the person should, if possible, use a soft toothbrush to clean their teeth.[1]<br>While the patient is waiting for referral to a dentist prescribe analgesia for pain relief.[1] | |
| **Treatment choices** | **First line:**[2,3]<br>**Metronidazole** 400mg *tds* for 3 days in conjunction with dental treatment. | **Second line:**[2,3]<br>**Amoxicillin** 500mg *tds* for 3 days in conjunction with dental treatment (irrigation or incision and debridement). |
| **Evidence** | 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.<br>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] CKS found no evidence that metronidazole is more (or less) effective than amoxicillin.[1] | |
| **References** | 1. CKS Clinical Knowledge Summaries – Gingivitis and Periodontitis **http://cks.nice.org.uk/gingivitis-and-periodontitis** (Accessed May 2014)<br>2. Scottish Dental Clinical Effectiveness Programme Drug Prescribing For Dentistry 2011 **http://www.sdcep.org.uk/** (Accessed May 2014)<br>3. BNF 67, March 2014<br>4. Management of Infection Guidance for Primary Care, PHE & BIA. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** (Accessed September 2014) | |

## Dental Infections – Dental Abscess

| | | |
|---|---|---|
| **When to treat** | 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]<br>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]<br>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] | |
| **General advice[2]** | 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.<br>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.<br>Advise the patient that antibiotic therapy is prescribed to reduce the spread of infection; **NOT** a substitute for dental treatment. | |
| **Treatment choices** | **First line:**[2,4]<br>**Amoxicillin** 500mg *tds* ***OR*** **Phenoxymethylpenicillin** 500mg -1g *qds* for up to 5 days, review at 3 days[5]<br>If spreading infection (lymph node involvement, or systemic signs, i.e. fever or malaise) ***ADD*** **Metronidazole**[4C] 400mg *tds* for 5 days[1,2] | **Penicillin Allergy: First line:**<br>**Metronidazole** 400mg *tds* for 5 days<br>**Penicillin Allergy: Second line**<br>**Clarithromycin** 500mg *bd* for up to 5 days, review at 3 days[5]<br>**If severe infection: Clindamycin** 300mg *gds* for 5 days[5] * |
| **Cautions** | Do not routinely provide repeat prescriptions or switch antibiotics in people who fail to respond to first-line treatment. Instead advise the person to see a dental practitioner urgently.[2] The failure of the antibiotic is not usually due to microbial resistance.[2] *High risk for *C difficile* infections | |
| **Evidence** | Amoxicillin and metronidazole are generally considered to be the antibiotics of choice for the management of dental abscesses. CKS found very little evidence to provide clear advice on which of the two antibiotics should be considered first-line.[2]<br>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]<br>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] | |
| **References** | 1. Scottish Dental Clinical Effectiveness Programme Drug Prescribing For Dentistry 2011 **http://www.sdcep.org.uk/** (Accessed May 2014)<br>2. CKS Clinical Knowledge Summaries – Dental Abscess http://cks.nice.org.uk/dental-abscess#!topicsummary (Accessed Aug 2014)<br>3. BNF 67, March 2014<br>4. Management of Infection Guidance for Primary Care, PHE & BIA. **https://www.gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections** Accessed September 2014<br>5. Martin MV, Longman LP, Hill JB, Hardy P. Acute dentoalveolar infections: an investigation of the duration of antibiotic therapy. British Dental Journal, 1997;183;135-37. | |



# IV/IM Drugs
in the Community

IV/IMD

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

# Fosfomycin

Information

## 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?**
Fosfomycin is currently licensed and can be sourced from Germany, France, Italy and Spain.

## 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.

**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.

**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*).

**Contraindications**
Hypersensitivity to fosfomycin.
Suspected bacteraemia.
GFR <10mL/min.

**Dosing: Complicated UTI or male patients**
Fosfomycin calcium 500mg capsules are licensed at 500mg-1gram every 8 hours.
Fosfomycin 3g sachets have been administered once every 48 hours.
A 7-day course (minimum) is recommended for male patients and for complicated lower urinary tract infections (e.g. catheter-associated UTI) without bacteraemia (Moroni M 1987 *Eur Urol*).

**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.

**Dosing in renal impairment**
GFR 10-50mL/min: 3gram single dose or 3grams every third day.

**Side Effects**

| More common than 1%: | Rare Serious Reactions: |
|---|---|
| Diarrhoea/Abdominal pain (10%)<br>Nausea/Indigestion (5%)<br>Headache (3-10%)<br>Skin rashes (1%)<br>Vaginitis (5%)<br>Asthenia (1%) | Serious hypersensitivity reactions<br>Impairment of hepatic function Aplastic anaemia |

## 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**

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