

Worcestershire Guidelines For Primary Care Antimicrobial Prescribing

Fourth Edition

JANUARY 2011



Always consider if antibiotic treatment is necessary

Prescribing antibiotics for viral or mild self limiting infections such as coughs and colds is unlikely to improve the course of the illness, puts patients at risk of side effects and encourages further consultations. Antibiotics should be targeted at those patients who are most likely to benefit. The Clinical Knowledge Summaries (CKS) Library contains many patient leaflets that support appropriate use of antibiotics (www.cks.library.nhs.uk). The Department of Health website gives details of the Public Health campaign and available leaflets (www.dh.gov.uk/en/publichealth/antibioticresistance)

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

INTRODUCTION

Welcome to the fourth edition of the Primary Care Guidelines for Antibiotic Prescribing. It is available both as a printed version and an electronic version, with useful web addresses.

The review group contains representatives of the key parties concerned with this area. The guide tries to provide a balanced picture and takes into account local sensitivity data, and its biases, likely pathogens, GP clinical problems at the interface, best prescribing practice, **evidence based medicine** and cost effectiveness.

The guide includes all the infection problems that general practitioners commonly encounter, and many sections have two parts - the first page is a quick reference guide to 1st and 2nd choices where appropriate, together with a few help notes [**1st line = preferred drug 2nd line = drug choice if 1st line is ineffective or inappropriate**]. The second page gives further details and helpful clinical pieces of information. It is usually divided into 3 sections: common pathogens, clinical details, and precautions.

It is intended that the guide is used to promote best practice and equity of practice across the county of Worcestershire, and is to be updated on a regular basis.

- **Always take a detailed history of any reported allergy to antibiotics** so that patients with a true allergy can be identified. Many patients who report that they are allergic only experienced minor symptoms such as GI disturbance. Restricting the choice of antibiotic on the basis of an inaccurate allergy history may result in them receiving sub optimal treatment.
- When prescribing antibiotics consideration must be given to **potential drug interactions**; refer to the current edition of the BNF or the drug's Summary of Product Characteristics (available at www.medicines.org.uk). Remember female patients may be receiving **oral contraceptives** from another prescriber. Also always consider if a premenopausal women may be pregnant when prescribing.
- **Always be aware of potential side effects of antibiotics, particularly *C.difficile* disease.** Advice on managing this condition is incorporated within these guidelines (see page 50) and further information is available in the Infection Control Guidelines.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

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

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U.T.I. Uncomplicated

Help Notes:

1st line: Fluids **and** Trimethoprim 200mg bd for 3 days
OR
Fluids **and** Nitrofurantoin **MR** 100mg bd for 3 days
(treat pregnant women and males for 7 days)

2nd line: As per MSU specimen sensitivity

- a) For 'complicated' UTI -see page 7
- b) Women with severe/ ≥ 3 symptoms: treat.
- c) Women with mild/ ≤ 2 symptoms: use dipstick to guide treatment. Nitrite & blood/leucocytes has 92% PPV; -ve nitrite, leucocytes, and blood has a 76% NPV.
- d) Asymptomatic bacteriuria does NOT generally require treatment
- e) For elderly, males, pregnant patients or children, or where there is fever/loin pain always send off an MSU sample
- f) For treatment in pregnancy, send MSU for culture & sensitivity and start treatment – see additional notes.
- g) In catheterised patients, avoid treatment, unless patient is systemically unwell. If clinically unwell, consider co-amoxiclav, and send urine for culture. Do not give prophylactic antibiotics for catheter changes unless history of catheter-change-associated UTI
- h) Do not use trimethoprim in patients on methotrexate as haematological toxicity can occur.

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Additional Notes: U.T.I.

Common Pathogens:

E. coli. *Coliform organisms* *Staph. saprophyticus* *Proteus mirabilis*

Clinical Details:

1. 70-80% of isolates are sensitive to trimethoprim. Trimethoprim attains higher concentrations for longer periods than beta-lactam antibiotics.
2. In pregnancy, send MSU for culture and sensitivity and start empirical antibiotics. Short-term use (i.e. 7 days) of nitrofurantoin in pregnancy is unlikely to cause problems to the foetus. Avoid trimethoprim if low folate status or on folate antagonist (e.g. antiepileptic or proguanil). *First line:* nitrofurantoin 100mg **m/r** bd. If susceptible, amoxicillin 500mg tds. *Second line:* trimethoprim 200mg bd (Unlicensed use in UK. Give folic acid if first trimester). **All treatment for 7 days.**
3. The presence of *Proteus* may suggest the possibility of renal or bladder calculi. *Staph. aureus* may indicate infection higher in the urinary tract. (MRSA guidance on page 40)
4. Quinolones are highly effective, but should never be used routinely, and only with microbiologist advice for complicated infections. Quinolones and cephalosporins have been highly associated with the incidence of *C difficile* diarrhoea.
5. ESBL (Extended Spectrum Beta-lactamase) producing organisms are becoming increasingly prevalent in the community. These should be treated according to sensitivity patterns. Nitrofurantoin is often effective, and some are susceptible to trimethoprim, co-amoxiclav or ciprofloxacin. Occasionally ertapenem, a once daily parenteral agent is advised.
6. Isolates are commonly still sensitive to nitrofurantoin (65-85% sensitive), even ESBL producing strains of Gram negative bacteria. Nausea is a common problem with this drug which can be reduced using capsules and/or the MR version. Avoid use in the elderly and in those with renal impairment.
7. Group B Strep bacteriuria reported during pregnancy, treat infection and consider use of peripartum antibiotics.
8. Sterile pyuria, consider urethritis (possibly chlamydia, TB or calculi).

Precautions:

50% of isolates are resistant to amoxicillin, and thus it is no longer suitable for empirical treatment of a UTI.

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Higher UTI or Pyelonephritis in Adults**Definition – Symptoms of higher UTI include:**

High fever, loin pain, rigors, flank pain, nausea, vomiting and diarrhoea. Symptoms of cystitis may or may not be present. Symptoms develop rapidly over a few hours or a day.

Help Notes:

- 1st line:** Co-amoxiclav 625mg tds for 14 days
- 2nd line:** Ciprofloxacin 500mg bd for 7 days
(in penicillin allergy) Use with caution as risk of *C. difficile*

- a) Always obtain an MSU for culture.
- b) Avoid cefalexin - insufficient activity.
- c) Admit to hospital if no response within 24 hours for IV therapy or if septicaemia is suspected.
- d) Do not treat catheter-associated bacteriuria, unless patient has systemic symptoms.
- e) MRSA in urine is difficult to treat - sensitivity results are essential. Do not treat CSU infections unless prior to surgery or as for note d).

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**U.T.I. in Children**

LOWER UTI: Trimethoprim for 3 days
OR
Nitrofurantoin for 3 days
OR
If susceptible, amoxicillin for 3 days

UPPER UTI: Co-amoxiclav for 7-10 days

NOTE – SEE CHILDREN'S BNF FOR DOSAGE

Help Notes:

- a) **Investigation of cause is commonly needed according to age of child. See NICE clinical guideline and local paediatric protocols.**
- b) In babies up to 3 months, IV antibiotics are recommended – refer immediately
- c) Repeat samples may be useful if diagnosis is in doubt.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Recurrent U.T.I.**

Recurrent UTI may be due to relapse or re-infection and may occur for a variety of different clinical reasons.

CKS gives very useful advice on how to manage symptoms in a wide variety of patients including:

Recurrent cystitis in non pregnant women and pregnant women; recurrent UTI in men; paediatrics; catheter associated UTI.

There is information on referral advice and non pharmacological methods of managing the problem including comprehensive patient information leaflets. Antibiotic prophylaxis should only be initiated when all of the above have been considered where appropriate.

1st line: Trimethoprim 100mg at night

2nd line: Nitrofurantoin 50mg – 100mg at night.
Capsules / MR may be better tolerated.

Review need after 6 months treatment
with prophylactic antibiotics.

Help Notes:

- a) Also consider standby antibiotics as an alternative.
- b) Post-coital prophylaxis – use recommended drug choices but as a single stat dose each time after sex(off-label use)
- c) For details of drug interactions with trimethoprim, please refer to the BNF. When given with methotrexate, there is an increased risk of haematological toxicity
- d) For details of the side effect profile and monitoring requirements with nitrofurantoin, e.g., pulmonary fibrosis, monitoring of liver and lung function, refer to BNF.
- e) If breakthrough infections become problematic, review choice of prophylactic agent.

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Acute Prostatitis

- 1st line:** Ciprofloxacin 500mg bd for 28 days
- 2nd line:** Ofloxacin 200mg bd for 28 days
If Chlamydia suspected, this option is more expensive for routine use.
- Alternative if not tolerated:** Trimethoprim 200mg bd for 28 days

Help Notes:

- a) Send MSU for culture and sensitivity.
- b) Consider an STD, send urine for chlamydia PCR.
- c) Most infections are caused by Gram negative bacteria.
- d) Chronic bacterial prostatitis may require 6-12 weeks treatment.
- e) Refer all patients with STD's to GUM clinic
- f) **NB risk of *C difficile* disease with quinolones. Stop immediately if diarrhoea occurs. In patients at high risk of, or previous, *C difficile* disease use an alternative agent.**

Additional Notes

Common Pathogens:

E. coli. *Gram negative bacilli* *Enterobacter spp.*

Clinical Details:

1. Prostatic tissues are best penetrated by drugs with a high pKa and high lipid solubility, such as quinolones.
2. Empiric treatment is common, but gonorrhoea and chlamydia should be excluded.
3. Late relapse (6-12 months after treatment) is common.

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Epididymo-Orchitis

In cases where aetiology most probably due to STI e.g. chlamydia

Doxycycline 100mg bd for 10-14 days.
OR
 Ofloxacin 200mg bd for 14 days.

In cases where aetiology most probably due to enteric organisms

Ciprofloxacin 500mg bd for 10 days
OR
 Ofloxacin 200mg bd for 14 days
 (NB Consider prescribing costs)

Relevant investigations in both cases:
 MSU and urine for chlamydia PCR and urethral swab for N. gonorrhoea culture if clinically indicated

Help Notes:

- a) In males <35 years, often caused by STI such as Chlamydia – if suspected, advise to abstain from intercourse until treatment finished. Suggest partner is screened and treated.
- b) In males >35 years, often caused by non sexually transmitted, Gram negative enteric organisms that cause UTIs, however crossover between both groups occurs.
- c) **If N. gonorrhoea is isolated, contact GUM Clinic.**
- d) In all cases- **testicular torsion** should be considered as a differential diagnosis especially in patients under 20 (although this can occur at any age) presenting with acute onset severe pain – this requires urgent surgical referral.
- e) Consider **mumps** in non immunised adults born between 1982-1986 with history of headache, fever and unilateral/bilateral parotid swelling 7-10 days prior to testicular swelling. Antibiotics not indicated.
- f) In all cases consider general support measures such as scrotal elevation (good supporting underwear), analgesia and bed rest.

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Bacterial Infections – Genital

Bacterial Vaginosis

Metronidazole 400mg bd for 5-7 days

OR

Metronidazole 2g single dose

OR

Intravaginal metronidazole gel 0.75%
5g at night for 5 nights

OR

Intravaginal Clindamycin 2% cream
5g at night for 7 nights.

Trichomonas

Metronidazole 400mg bd for 5-7 days

OR

Metronidazole 2g single dose

Help Notes:

- a) Diagnosis based on swab. History of vaginal discharge with odour (typically fishy) and raised pH of vaginal fluid very suggestive of infection.
- b) Oral metronidazole is as effective as topical treatment and more cost effective.
- c) For those intolerant to metronidazole use clindamycin vaginal cream.
- d) For **bacterial vaginosis in pregnancy**, avoid 2g dose, treat with oral metronidazole 400mg bd for 7 days as early as possible in the 2nd trimester. (There is no evidence of teratogenicity in humans when used at this dose).
- e) **Group B strep** is normal flora in the vagina and when isolated in an HVS does not require treatment, however when isolated in pregnancy peri-partum antibiotics should be considered. Ensure patients are aware of risks and notes annotated accordingly, and appropriate advice leaflet given (see RCOG website)
- f) **Trichomonas** is a sexually transmitted infection, consider contact tracing. Treat partners and refer to GUM clinic.
- g) Consider HIV or syphilis testing in all cases of STD.

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Disease (P.I.D.)**

Ofloxacin 400mg bd **And**
Metronidazole 400mg bd for 14 days

Help Notes:

- a) In cases of suspected PID, offer testing for chlamydia and gonorrhoea.
- b) If treatment failure in P.I.D., reassess diagnosis and antibiotic compliance, consider referral to Gynaecology or GUM clinic.
- c) Consider admission if systemically unwell.
- d) In pregnancy, seek specialist advice.
- e) Partners of index patients diagnosed with PID should be offered antichlamydial treatment empirically.

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Bacterial Infections - Genital

Chlamydia

Azithromycin 1 gram as a single dose

OR

Doxycycline 100mg bd for 7 days

Alternative regimens

Erythromycin 500mg bd 14 days

OR

Ofloxacin 200mg bd or 400mg od for 7 days

Gonorrhoea**Refer to GUM clinic****Non-gonococcal urethritis (NGU)**

Azithromycin 1 gram as a single dose

For recurrent infection:

Azithromycin 500mg stat, then 250mg for the next 4 days **AND** Metronidazole 400mg BD for 5 days**Help Notes:**

- a) Contact tracing and treatment is an important issue.
- b) STDs often co-exist with other infections.
- c) In **pregnancy**, erythromycin 500mg bd for 14 days or Azithromycin 1g stat (Unlicensed use in UK) should be used, retest to ensure clearance. If treatment failure, refer to GUM clinic.
- d) 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)

- a) Treatment for recurrent infection should include cover for *Mycoplasma genitalium* and *Trichomonas vaginalis*
- b) Consider referral to / advice from GUM clinic

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Genital Viral Infections

Primary Herpes simplex (Type 1 or 2)

Aciclovir 200mg 5 times daily for 5 days

Mild recurrent attacks

Manage symptomatically

Infrequent severe recurrences

Treat each occurrence with 5 days aciclovir as above

Frequent severe recurrences (more than 6 episodes /year)

Aciclovir 400mg bd for 6-12 months (review 3 monthly)

Help Notes:

- a) Depending on severity, a topical analgesic (e.g. lidocaine 2%) can be prescribed. Discuss other measures for pain relief - oral analgesics and daily soaks/baths in saline solution.
- b) Watch out for secondary bacterial infection. STDs commonly co-exist, & therefore refer to GUM for new presentations.
- c) Syphilis testing should be offered in all patients with genital ulceration.
- d) Patients are advised to avoid sexual intercourse until lesions have healed.
- e) In all cases of HSV in pregnancy, seek advice for details of management.
- f) In difficult cases seek GUM advice.
- g) Explanations as regards latency of infection should be offered with GUM referral if further counselling required.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Fungal Genital Infections**

Fluconazole oral 150mg Single dose
(NOT IF PREGNANT OR
POSSIBLY PREGNANT)

OR

Clotrimazole pessary 500mg Single application

Help Notes:

- a) If the vulva is very inflamed topical treatment may be painful – use oral fluconazole. Avoid perfumed soap and shower gels. Topical clotrimazole HC cream bd may alleviate symptoms.
- b) Recurrent vaginal infections may suggest possible underlying pathology e.g. diabetes. Take a swab to confirm diagnosis and assess antifungal susceptibility of any Candida isolated. See CKS guidance for further information on the management of vaginal discharge. Avoid antibiotic therapy where possible as it may precipitate candidiasis.
- c) For penile candidiasis use 1% clotrimazole topical cream.
- d) Clotrimazole pessaries and cream (but not HC version) and fluconazole capsules can be purchased from community pharmacies.

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Community Acquired Pneumonia

Manage using clinical judgment and modified CRB-65 score as follows (each scores 1):

Confusion (AMT <8), **R**espiratory rate >30, **B**P systolic <90mmHg, diastolic <60, Age >**65** years

***Mild infection
(CRB-65 score 0)***

First line:

Amoxicillin 500mg tds for 7 days

Second line / penicillin allergy

Clarithromycin 500mg bd for 7 days

OR

Doxycycline 200mg stat, 100mg od for 7 days

Moderate infection (CRB-65 score 1 or 2)

Amoxicillin 500mg tds

and Clarithromycin 500mg bd for 7-10 days

OR

Doxycycline 200mg stat, 100mg od for 7-10 days as a single agent

Severe infection (CRB-65 score 3+)

Urgent hospital admission

Help Notes:

- a) If pneumonia is suspected, pneumococci account for 70+% of cases. In Worcestershire penicillin resistance in pneumococci is extremely rare.
- b) If an atypical pneumonia is strongly suspected, then clarithromycin would be 1st choice.

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Acute cough / bronchitis**Help Notes:****1st line:**

Amoxicillin 500mg tds for 5 days

ORDoxycycline 200mg stat then 100mg od
for 5 days

- a) **Antibiotic little benefit if no co-morbidity.**
- b) Symptom resolution can take 3 weeks.
- c) Consider 7-14 day delayed antibiotic with symptomatic advice/leaflet.
- d) Older patients with acute bronchitis are more likely to require antibiotics.
- e) Most *H. influenza* strains are resistant to erythromycin, therefore not advised in this condition.

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C.O.P.D. Acute Exacerbations**If likely to be bacterial:****1st line:**

Amoxicillin 500mg tds for 5-7 days

ORDoxycycline 200mg stat then 100mg od
for 5-7 days**2nd line:**

Clarithromycin 500mg bd for 5-7 days

If resistance risk factors:

Co-amoxiclav 625mg tds for 5-7 days

Help Notes:

- a) Many acute infective exacerbations are viral, and do not require antibiotics.
- b) Patients with recurrent infections will require longer courses, and sputum cultures should be taken.
- c) Consider standby home packs of 1st line antibiotics and oral steroids, if indicated, for appropriate patients.
- d) COPD patients require single pneumococcal vaccination and annual influenza vaccination.
- e) In some circumstances more than 7 days treatment may be needed, particularly in patients with features of bronchiectasis.

Risk factors for antibiotic resistant organisms include:

- co-morbid disease,
- severe COPD,
- frequent exacerbations,
- antibiotics in last 3 months.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Additional Notes: Respiratory Tract Infection

Common Pathogens:

Haemophilus influenzae

Streptococcus pneumoniae

Moraxella catarrhalis

Atypical - *Mycoplasma pneumoniae*, *Legionella pneumophila*

Clinical Details:

1. Use of beta-lactam antibiotics - **amoxicillin remains the treatment of choice in patients not allergic to penicillins**, as resistance in pneumococci is very rare locally, and most strains of *H. influenzae* are also sensitive. Question carefully about penicillin allergy to validate it. Co-amoxiclav is active against beta-lactamase producing organisms but does not cover penicillin-resistant pneumococci.
2. Uses of macrolides - erythromycin, clarithromycin and azithromycin all have a similar spectrum of activity, and resistance to one usually indicates resistance to all these compounds. Resistance in pneumococci is uncommon, but some *H. influenzae* strains are less susceptible.
3. Use of cephalosporins (e.g. cefalexin) – inappropriate as oral agents for chest infections (insufficient activity against *Haemophilus sp*), also increased risk of *C.difficile* disease.
4. Use of quinolones – Not generally advised due to risk of *C.difficile* disease. Ciprofloxacin & ofloxacin are not reliably effective against pneumococci, and should not be used to treat primary pneumonias. Quinolones penetrate into lung tissue well, and are thus useful in treating difficult cases of COPD and bronchiectasis. They are not licensed for use in children or in pregnancy, although ciprofloxacin has been used extensively in paediatric cystic fibrosis. Moxifloxacin is more effective against pneumococci, this may be occasionally prescribed if no suitable alternative available.
5. Use of tetracyclines - there is little difference in activity for various tetracyclines. Most of the atypical organisms are sensitive, as are a majority of the pneumococci and *Haemophilus influenzae* isolates. Tetracyclines are bacteriostatic, and as they cannot be used in children or pregnancy, their role is limited to less severe infections in adults.
6. Consider pneumococcal and influenza vaccines in 'at risk' cases. (see annual CMO letter and HMSO publication -Immunisations against Infectious Diseases).

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Bronchiectasis****During an exacerbation:**

Base choice on results of previous sputum cultures and response to previous treatment.

Options include:

Amoxicillin 500mg tds for 14 days

OR

Oxytetracycline 500mg qds for 14 days

OR

Doxycycline 100mg bd for 14 days

OR

Ciprofloxacin 500mg bd for 14 days.
(NB – risk of *C.diff* disease)

Help Notes:

- a) High doses of amoxicillin e.g. 3g bd for 14 days are sometimes given to patients with advanced cystic bronchiectasis to improve sputum penetration.
- b) Patients with severe impairment of lung function or who have developed acute respiratory failure may require IV therapy and may require admission to hospital.
- c) Patients with bronchiectasis require single pneumococcal vaccination and annual influenza vaccination.
- d) There is little evidence to support the use of inhaled antibacterials during exacerbations.
- e) There is little evidence on whether long-term antibacterial therapy should be given between exacerbations. This will depend on individual patients, for some longer courses of therapy may be preferential, usually on advice of respiratory team.

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Whooping Cough

1st line: Clarithromycin 500mg bd for 14 days

2nd line: Discuss with microbiologist

Chemoprophylaxis: Clarithromycin 500mg qds for 7 days

NB: Erythromycin oral suspension is more cost effective for children.

Help Notes:

- a) If strong clinical suspicion of whooping cough, refer to microbiology for a pernasal swab for immediate processing to improve isolation rates of *Bordetella pertussis*
- b) Although most infectious during the initial catarrhal phase, antibiotics given in the paroxysmal phase may decrease severity, duration and communicability of disease. 14-day treatment prevents bacteriological relapse.
- c) The role of chemoprophylaxis for contacts is uncertain. However, consider for close contacts of cases, particularly unimmunised children or partially immunised infants, or adults who come into close contact with vulnerable children.
- d) Causative organism is *Bordetella pertussis*. However the classical symptoms of whooping cough may also be the result of other agents, notably parainfluenza virus.
- e) Whooping cough is a notifiable disease. Complete the notification and return to the CCDC/HPA. If further information is needed, contact CCDC/HPA or Public Health Consultants if out of hours.
- f) Patient advice leaflet available on www.cks.library.nhs.uk

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Bronchiolitis**

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

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Croup – Acute Laryngotracheobronchitis**

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

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Otitis Media****Help Notes:**

1st line: Amoxicillin 500mg tds for 5 days

2nd line: Erythromycin 250mg qds for 5 days

- a) In childhood, consideration should be given to whether antibiotic treatment is relevant. It may be appropriate to reserve treatment for high risk groups e.g. children under 2 years, those who are systemically unwell or those who have recurrent infections, patients with bulging/red tympanic membranes, or adults.
- b) Ensure adequate analgesia is given
- c) Consider delaying prescription for 2 days to see if condition resolves on its own.
- d) In penicillin allergic patients use erythromycin.
- e) Consider ENT referral for recurrent episodes.

NOTE – SEE CHILDREN'S BNF FOR DOSAGE

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Additional Notes: Otitis Media****Common Pathogens:**

Viruses	<i>Strep. pneumoniae</i>	<i>Haemophilus influenzae</i>	<i>Group A Streptococci</i>
	<i>Moraxella catarrhalis</i>		

Clinical Details:

1. Current debate lies in whether to prescribe antibiotics at all. Health Protection Agency guidelines suggest that antibiotics should be avoided as 60% of cases are better in 24 hours without: they only reduce pain at 2 days and do not prevent deafness.
2. Feared complications are rare e.g. mastoiditis, meningitis
3. Reduction in frequency of prescribing of antibiotics may help limit the increasing antibiotic resistance among bacteria implicated in this type of infection.
4. A strategy of watchful waiting and use of delayed prescriptions may be appropriate for many children. Paracetamol and ibuprofen can be used for symptomatic relief of pain and fever.
5. If antibiotics are prescribed, a five day course is probably adequate.
6. See www.cks.library.nhs.uk for patient information leaflets.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Otitis Externa

The mainstay of treatment of diffuse otitis externa is effective, thorough aural toilet, using topical astringents e.g. Acetic acid 2% (EarCalm®), which can be purchased from community pharmacists.
Always ensure adequate analgesia is given.

Topical

1st line: Acetic Acid Spray 2% (EarCalm®) use one spray, tds for 7 days

2nd line: Betamethasone-neomycin 2-3 drops tds/qds for 7 days min to 14 days max

Oral

1st line: Flucloxacillin 500mg qds for 7 days

2nd line: Clarithromycin 500mg bd for 7 days

Fungal: Clotrimazole 1% solution
3 drops tds for 4 weeks

Help Notes:

- a) Topical treatment is usually effective. Swabs of ear discharge may guide treatment.
- b) Patients should be advised to keep the ear clean and dry, due to the risk of secondary fungal infection.
- c) Treatment for longer than 7 days should be avoided, as bacterial resistance will occur and may result in fungal infection.
- d) If the eardrum is perforated, the use of drops containing aminoglycosides is contra-indicated (CSM advice, see BNF).
- e) Oral antibiotics are indicated if the patient is systemically unwell or there is evidence of spreading infection.
- f) In penicillin allergic patients use clarithromycin.
- g) Fungal infections are difficult to treat and may require specialist referral.
- h) If condition recurrent, consider underlying disease such as diabetes or exfoliative skin conditions.
- i) For severe or recurrent episodes, refer to ENT

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Additional Notes: Otitis Externa**

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

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Dental Infections

Gingivitis Chlorhexidine mouthwash 10ml bd for 7 days.

Acute Ulcerative Gingivitis (AUG) Chlorhexidine Mouthwash 10ml bd and metronidazole 200mg tds for 3 days.

Acute Dental Abscess
1st line Amoxicillin 250mg tds for 5 days.
 For severe infections with suspected anaerobic infection, add metronidazole 200mg tds for 3 days until symptoms subside

2nd line Metronidazole 200mg bd for 3 days
OR
 Clarithromycin 250mg bd for 5 days

Help Notes:

- a) Good oral hygiene and a mouthwash are used in the first instance for generalised gingivitis.
- b) AUG is marked by painful ulcerated gingiva, with patient feeling generally unwell.

Help Notes:

- a) Dental abscesses require drainage or removal of source of infection if possible and so a dental opinion should be sought.
- b) Urgent referral will be required for rising swelling/indications of septicaemia.
- c) Pulpitis is extremely painful and requires dental treatment. Antibiotics are ineffective, NSAIDs may help symptoms.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Pharyngitis

Help Notes:

1st line: Phenoxyethylpenicillin 500mg qds
for 10 days

(see help notes)

2nd line: Clarithromycin 250-500mg bd for 5
days

- a) Remember that many sore throats are viral, and thus you should have a considered intention to treat for bacterial infections e.g. *Strep. pyogenes*.
- b) In penicillin allergic patients use clarithromycin first line.
- c) Consider giving 'a delayed prescription' i.e. "if you are no better in 48 hours, then take your antibiotic".
- d) Consider a throat swab prior to treatment for recurrent infections.
- e) Amoxicillin may be used instead of penicillin for children, because of better taste.
- f) For recurrent infections, more prolonged & aggressive therapy may be required.
- g) Consider diphtheria, if travel history is appropriate.
- h) Consider glandular fever within differential diagnosis.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Additional Notes: Pharyngitis****Common Pathogens: VIRUSES****Less commonly -** *Streptococcus pyogenes*; *Haemophilus influenzae* (under 5's)**Clinical Details:**

1. The Health Protection Agency state that antibiotics should be avoided as 90% of cases resolve in 7 days without them, and pain only reduced by 16 hours. Consider giving only advice and/or advice sheet and/or a delayed prescription to be dispensed only if the condition does not improve in 2 - 3 days along with analgesics for symptom relief.
2. If centor score 3 or 4: (Lymphadenopathy; No cough; Fever; Tonsillar Exudate) consider 2 or 3 day delayed or immediate antibiotics. The presence of 3 or 4 of these clinical signs suggests the chance of having Group A beta-haemolytic streptococcus (GABHS) is between 40 and 60% so patient may benefit from an antibiotic.
3. Only 30% of throat infections are bacterial in origin. This may be up to 50% in the 4 -13 yrs age group. Streptococcal throat infections are less common in infants; other organisms in infants include Haemophilus for which amoxicillin is appropriate first line therapy.
4. Viral and bacterial throat infections are indistinguishable except for Scarlet Fever (causative organism - *Strep. pyogenes*). However, both are usually self-limiting. There is some evidence that recurrence and relapse may be more common in those who have had early treatment with antibiotics and patients are more likely to return to their GP.
5. Severe pharyngitis, pronounced systemic features and scarlet fever have been suggested as diagnostic features to prompt antibiotic treatment.
6. Complications such as abscess (quinsy), rheumatic fever and kidney problems are rare, and outcomes are not affected by a short delay in treatment.
7. Penicillin is the drug of choice for treating *Strep. pyogenes* infection, but children may prefer the taste of amoxicillin syrup.

Precautions:

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

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Oral Candidiasis

Symptoms may resolve on withdrawal of precipitating factor e.g. antibiotics

Help Notes:

- 1st line:**
(Topical treatment) Nystatin suspension
 100,000 units qds
OR
 Miconazole oral gel 5-10ml qds
- Continue treatment 48 hours after
 lesions have resolved.
- 2nd line:**
(Systemic treatment) Fluconazole 50mg/day
 for 7-14 days

- a) Oral candidiasis is unusual in immunocompetent individuals without clear predisposing factors e.g. recent antibiotics or steroid treatment.
- b) In neonates, miconazole oral gel may be preferential.
- c) Oral candidiasis is a common opportunistic infection, caused by the overgrowth of *Candida* spp., most commonly *Candida albicans*.
- d) Predisposing factors include antibiotic or cytotoxic drug therapy, dentures, smoking, diabetes mellitus, high carbohydrate diet, malignancies and immunosuppressive conditions (including HIV), oral and inhaled steroids.
- e) The management of individual patients will depend on the underlying predisposing condition. Symptoms may resolve simply on withdrawal of antibiotic or cytotoxic therapy. Prophylactic antifungal treatment may be necessary in some groups of patients.
- f) Inhaled corticosteroid users should be given oral hygiene advice and encouraged to use a spacer (when appropriate to the device).
- g) Immunocompetent children should only receive topical treatment.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Sinusitis**ACUTE****1st line:**

Amoxicillin 500mg tds for 7 days

2nd line:

Oxytetracycline 250mg qds for 7 days

ORDoxycycline 200mg stat, then 100mg od
for 7 days**CHRONIC**

Co-amoxiclav 625mg tds for 7 days

Help Notes:

- a) **Many cases will be viral, therefore will not require antibiotics.** Only 30-40% will have bacterial infection.
- b) Antibiotics should be used when there is systemic illness, or several severe signs and symptoms that last longer than 7-10 days, or worsen after 5-7days.
- c) Consider delayed prescriptions.
- d) Ensure appropriate analgesics are given. Symptoms may persist for 2-3 weeks regardless of antibiotics.
- e) For chronic (frequently relapsing) sinusitis, consider referral, and/or consider co-amoxiclav 625mg for 7 days.
- f) In penicillin allergic patients use oxytetracycline or doxycycline.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Animal and Human Bites

1st line: Co-amoxiclav 625mg tds for 7 days

Help Notes:

- a) Superficial bites where the skin is not broken require local treatment only.
- b) Puncture wounds/penetrating bites should always be treated with antibiotics.
- c) In genuine penicillin-allergic adult patients use doxycycline 100mg bd and metronidazole 200-400mg tds for 7 days.
- d) In children, use co-amoxiclav, but in cases of penicillin allergy use clarithromycin and metronidazole.
- e) For human bites consider blood-borne viruses. Follow the blood borne contamination incident policy.
- f) Consider rabies immunisation if bitten abroad. Contact Microbiologist on-call / CCDC.
- g) *Pasteurella multocida* (dog and cat bites) is mostly sensitive to penicillin, but local treatment such as cleaning, irrigation or debridement is also helpful.
- h) When anaerobe infection is suspected (e.g. a smelly wound), metronidazole may be useful.
- i) Check tetanus status.
- j)

The blood borne contamination incident policy can be found on the Worcestershire Health Services website: www.worcestershirehealth.nhs.uk / Infection Control Services / policies and procedures / Appendix I: blood borne contamination incident policy

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Bacterial skin Infections

Impetigo:

**For non-serious
/non spreading**

Topical Fusidic Acid cream qds for 5 days

**For recurrent or
extensive
infection**

Oral Flucloxacillin 500mg qds for 7 days

Eczema

In eczema with visible signs of infection, use treatment as in impetigo

Help Notes:

- **DO NOT use on extensive areas**, reserve use for very localised lesions only to reduce risk of resistance
 - **NOT for repeated use**
- a) Topical mupirocin MUST be reserved for known MRSA infection or PVL toxin associated Staphylococcal colonisation.
 - b) Topical antimicrobial / antiseptic liquids and soaps are effective in reducing bacterial colonisation. (e.g. Octenisan (Available on FP10) / chlorhexidine or suitable available alternatives as recommended by Infection Control)
 - c) In penicillin allergic patients, use clarithromycin 500mg bd
- a) If no visible signs of infection, use of antibiotics (alone or with steroids) encourages resistance and does not improve healing

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

**Bacterial skin Infections -
Cellulitis and Erysipelas****Help Notes:****Cellulitis:**

Flucloxacillin 500mg qds for 7days. If slow response continue for a further 7 days.

- a) In rapidly spreading cellulitis, consider parenteral antibiotics - potential medical emergency.
- b) **Diabetic patients are a special subgroup & require a different approach - see *additional notes*.**
- c) For recurrent cellulitis of lower limb, exclude fungal foot infections e.g. infected in-growing toe nails.
- d) Beware puncture wounds – consult microbiologist.
- e) For penicillin allergy, clarithromycin 500mg bd for 7-14 days. Discuss with microbiology for difficult cases.
- f) For unusual circumstances e.g. after travel abroad, unusual exposure to salt or fresh water, refer to microbiologists.
- g) For orbital cellulitis, use co-amoxiclav 625mg tds for 7-14 days. This condition often requires hospital referral.
- h) If patient is known to be colonised with MRSA – seek microbiological advice.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Cellulitis Associated with Lymphodema

Help Notes:

1st line

Flucloxacillin 500mg qds for no less than 14 days.

If there is no response after 48 hours:
Clindamycin 300mg qds

Penicillin allergy:
Clarithromycin 500mg bd

Recurrent Cellulitis

Phenoxymethylpenicillin 500mg daily (1gram if weight greater than 75kg), then after one successful year reduce to 250mg daily, then after another successful year stop.

In penicillin allergy:
Clarithromycin 250mg daily

- a) Refer to full lymphodema guidelines for the management of these patients. The management of this group of patients is multifactorial of which antibiotic treatment is only a part.
- b) It may take as long as 1-2 months of treatment to achieve complete resolution.
- c) If diarrhoea develops, stop antibiotics and consult microbiologists.
- d) If patient is known to be colonised with MRSA, consider doxycycline. A second agent may need to be added e.g. fusidic acid or rifampicin for optimal tissue penetration. Seek further advice from a consultant microbiologist.
- e) The risk of further attacks is high, so consider a two week home supply.
- f) Prophylaxis may need to be life-long if relapse occurs when antibiotics are discontinued after a two-year period of successful prophylaxis.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Additional Notes: Bacterial Skin Infections - Cellulitis

Common Pathogens:

Staph. aureus (including MRSA)
Pyogenic Streptococci (A,C,G)
 Deep ulcers – anaerobes

Less common pathogens

Coliforms (commensal - rarely pathogenic)
Pseudomonas aeruginosa (can be a commensal)
Klebsiella spp. *Enterobacter spp.*

Clinical Details:

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

1. All cases of cellulitis should be treated promptly, to reduce the risk of development of septicaemia. In most cases the causative agent is the group A beta-haemolytic streptococcus. Secondary infection with *Staph. aureus* is relatively common, especially in diabetic patients. Cellulitis in special groups such as immunocompromised patients and diabetics may be due to other less common pathogens as well.
2. *H. influenzae* cellulitis is occasionally seen in children, often orbital. Treatment here should be co-amoxiclav (IV cefotaxime may be necessary). Cellulitis can develop into necrotising infections e.g. anaerobic cellulitis and gas gangrene. Like rapidly spreading cellulitis, these are regarded as medical emergencies, and need urgent referral.
3. **Diabetic patients:** Whilst staphylococcal skin infections are common in diabetics, other organisms can often be present. Coliforms (including *E. coli* & *Klebsiella spp.*) and group B streptococci can cause infection in diabetics in areas of ischaemia, trauma or abdominal surgery. *Pseudomonas* is also an opportunistic pathogen in diabetic skin infections.
4. **For Diabetic foot infections:** start treatment but refer to podiatry to establish and manage the underlying cause. Consider taking swabs, but start treatment with antibiotics. Signs of active clinical infection such as increasing pain, spreading cellulitis, exudates and pus should be treated with co-amoxiclav 625mg tds for 7 days. Review after one week and consider a further supply and/or send swab to microbiology. If patient allergic to penicillin or any queries relating to choice of antibiotic – discuss with microbiology. Refer to local guidelines on referral of patients with diabetes to podiatry and NICE guidelines on diabetic foot problems.
5. **Leg Ulcers** – Bacteria always present, and antibiotics do not improve healing. Only take swabs if evidence of clinical infection (increased pain or exudates, rapid deterioration). If surrounding cellulitis, consider co-amoxiclav 625mg tds for 7 days and review.
6. If necrotic tissue present, may require early debridement and high dose intravenous antibiotics – close review is essential.

Furunculosis and folliculitis:

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

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Mastitis**Help Notes:**

- 1st line:** Flucloxacillin 500mg qds for 7 days
- 2nd line:** Co-amoxiclav 625mg tds for 7 days
- In penicillin allergy:** Clarithromycin 500mg bd for 7 days
OR
Clindamycin 300mg qds for 7 days

- a) Mastitis usually caused by *Staphylococcus aureus* (in all age groups). Less frequent causes include streptococci, atypical mycobacteria (especially around breast prosthetic implants) and Gram negative bacteria. Occasionally tuberculosis may need to be considered.
- b) When fluctuance present, consider aspiration, or referral for surgical drainage.
- c) Fungi and candida are rare causes of mastitis. There is very little evidence to support the concept of candida as a cause of deep breast pain in lactation.
- d) Avoid drying/cracking of nipples during lactation. See www.cks.library.nhs.uk for patient information leaflets.
- e) Other measures include breast support, ice packs and analgesics
- f) **Breast feeding** may continue unless an abscess develops.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**MRSA Infection**

See Wound Management guidelines for the treatment of infected wounds.

**Skin Lesions
(small)**

Mupirocin cream/ointment tds for 7-10 days

**Invasive/
Systemic
Infection**

Two antibiotics e.g.
Trimethoprim 200mg bd for 5-7 days
OR
Doxycycline 100mg bd for 5-7 days

PLUS

Sodium fusidate oral 500mg for 5-7 days
OR
Rifampicin oral 300mg bd for 5-7 days

Help Notes:

- a) Cover infected/colonised area with povidone iodine or chlorhexidine dressing.
- b) Avoid prolonged or repeated treatments.
- c) Mupirocin ointment should not be applied to large wounds (risk of nephrotoxicity with polyethylene glycol base)
- d) Mupirocin ointment may also damage PEG sites and other plastic devices e.g. central venous lines.
- e) Send specimens for sensitivity testing to guide appropriate combination therapy.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

MRSA - COLONISATION

Eradication of MRSA Carriage:

Nasal Carriage

Mupirocin nasal ointment tds for 5 days. Use only if known to be sensitive and for 2 courses only.
For strains resistant to mupirocin use
Naseptin nasal cream qds for 10 days. Do not use in known peanut and/or soya allergy.

Skin Carriage

Octenisan antimicrobial wash lotion – use daily for 5 days.
Chlorhexidine acetate 1% dusting powder (CX antiseptic dusting powder®) applied daily for 5 days to intact axillary or groin areas.

Throat Carriage

Significance unclear, discuss with microbiologist

Help Notes:

- a) Many laboratory reports of MRSA indicate *colonisation* not *clinical infection*.
- b) The decision to treat MRSA carriage will depend on the clinical setting – please see local infection control policy or discuss with the microbiologist/infection control team
- c) Octenisan wash lotion should be used like a shower gel daily, with a contact time of 3 minutes on the skin. It also should be used 2 out of the 5 days like a shampoo on the hair. (Available on FP10).

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Acne

1st line: Topical treatment

Benzoyl peroxide

2nd line: Topical treatmentBenzoyl peroxide + antibiotic
e.g. clindamycin or erythromycin**3rd line: Oral treatment**Oxytetracycline 500mg bd
Continue for at least 4-6 months
OR
Lymecycline 408mg daily
Continue for at least 4-6 months
OR
Doxycycline 100mg daily
Continue for at least 4-6 months**Help Notes:**

- a) Resistance of *P.acnes* to both topical and oral antibiotics is rapidly developing. Topical antibiotics should not be used as monotherapy.
- b) For comedonal acne topical retinoids are the treatment of choice. Avoid using in pregnancy.
- c) Mild infection can be treated with topical antibiotics or benzoyl peroxide (NB: Peroxides are generally cheaper).
- d) All tetracyclines are probably equally effective, but are **contra-indicated** for use in children under 12 years, pregnant and breast-feeding women. With the exception of doxycycline, the tetracyclines may exacerbate renal failure and should not be given to patients with kidney disease. They should be used with caution in patients with hepatic impairment or those receiving potentially hepatotoxic drugs.
- e) Tetracyclines may cause photosensitivity.
- f) Avoid minocycline due to risk of hepatotoxicity

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Fungal Infections – Skin and Nail

Fungal Skin Infection

Topical agents (also available without prescription)
e.g. Imidazole creams, Terbinafine 1%, Undecanoic acid,

Ketoconazole shampoo (for pityriasis versicolor)

Terbinafine oral 250 mg od for 2-4 weeks

Itraconazole oral 200 mg od for 7 days (pityriasis versicolor)

Fungal Nail Infection

Amorolfine 5% nail lacquer 1-2 times weekly for 6 months (fingers), 12 months (toes)

Terbinafine oral 250mg od for 6-12 weeks (fingers), 3-6 months (toes)

Itraconazole oral pulsed courses of 200mg bd for 7 days, repeated after a 21 day interval (finger nails generally require 2 courses, toenails 3 courses)

Help Notes:

- a) Take scrapings for culture.
- b) Use topical creams if mild disease.
- c) For extensive athlete's foot, oral terbinafine for 2 weeks should be considered. If imidazole creams are used (e.g. clotrimazole, econazole, miconazole) 4-6 weeks therapy may be required.
- d) Terbinafine and undecanoic acid are not licensed for children.

- a) Consider whether investigation/treatment is appropriate.
- b) Take clippings for culture.
- c) Topical treatment is expensive and only appropriate where infection is limited to distal end of nails.
- d) Nail infections are usually trivial in most cases, but treatment actively recommended in diabetic, elderly patients or peripheral vascular disease to prevent a portal of entry for more severe infection.
- e) Monitor liver function according to manufacturer's guidance.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Additional Notes: Fungal Infections****Common Pathogens:**Nail infection - *Dermatophytes*Athlete's Foot, Ringworm - *Tinea***Clinical Details:**

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

Precautions:

Use topical treatments in pregnancy.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Parasite Infections

Detailed advice is given in the Parasite policy, produced by the West Midlands West Health Protection Unit. Additional sources for help and advice are the Infection Control Policies & Procedures produced by the Worcestershire Acute Hospitals NHS Trust.

Brief treatment guidelines for Scabies and Head Lice infections are as follows:

SCABIES Recommended preparations: Permethrin dermal cream 5% (Lyclear®)
Or if allergy
Malathion 0.5% in aqueous base (Derbac M liquid®)

For both preparations, apply 2 applications, one week apart (see patient leaflet for further details). Ensure sufficient quantity is prescribed to cover body size.

1. Since symptoms take several weeks to appear, it is easy for close contacts to become infected before the disease is suspected. Therefore, all close (body) contacts (whether symptomatic or not) should be treated at same time as the index case. Non-compliance by just one individual may make the difference between a success or failure of a planned treatment. The manufacturer's instructions must be followed carefully.
2. Treat all home and sexual contacts with 24 hours. Treat whole body from ear/chin downwards and under nails. If under 2 / elderly, also treat face and scalp.
3. **Do not** use Lyclear dermal cream in pregnant or breast feeding women, nor in very small children. Derbac M liquid may be used with caution in pregnancy.
4. For crusted scabies, seek advice from Health Protection Team.
5. Outbreaks of scabies in care homes must be reported to the HPA. Specialist advice will be given for treatment of residents and staff.
6. Bedding and clothing may be washed in the normal manner. No special precautions are necessary.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Parasite Infections Continued**

HEAD LICE There are 3 treatment options:

- a) Treatment with a parasitocidal liquid
- b) Treatment with other products
- c) Treatment without parasitocidal liquid

- a) Malathion (e.g. Derbac M liquid®) is a parasitocidal liquid. One product should be used for a course of treatment (2 applications, 7 days apart); if this fails, then another product with a different active ingredient should be tried. Check if treatment failure is due to using the product incorrectly. There is no effective preventative therapy for head lice and parasitocidal preparations used to treat head lice have no residual effect.
- b) Dimeticone 4% lotion (Hedrin®) has a physical rather than chemical mode of action and so has potential benefits as an alternative to conventional chemical insecticides as no resistance towards it has been documented. When covered by dimeticone in its silicone solvent, lice become immobilised, from which they never recover. Dimeticone is not absorbed transdermally.
- b) The combing method is an option for those reluctant to use chemicals; however it requires a substantial time commitment to ensure all hair is combed through, and may fail if not done correctly. The combing method uses a detection comb to physically remove lice from hair. It must be undertaken every 3 days for at least 2 weeks (longer in severe cases). The hair is washed in normal way, and towel dried. Application of conditioner helps the comb to slide through the hair more easily; it has no inherent parasitocidal properties, and is therefore not a treatment - it is used only as an aid to combing. Head lice devices are now available on prescription, see drug tariff for details.

All products can be purchased from community pharmacies.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Chickenpox and Shingles

NB – for pregnant / immunocompromised / neonate: seek urgent specialist advice

Help Notes:

Shingles severe

Treatment should be considered for adults >50 years and within 72 hours of rash (PHN rare if <50 years), and adults of any age who:

- present with severe acute pain + extensive rash
- have ophthalmic involvement (requires urgent referral to ophthalmology)
- immunocompromised
- have Ramsay Hunt syndrome
- have atopic eczema
- have contacts with very young infants, immunocompromised people or pregnant women.

Aciclovir 800mg 5 times a day for 7 days

- a) Start as early as practicable, and **within 72 hours** of start of symptoms.
- b) Reduces pain & post herpetic neuralgia. Predictive factors for post-herpetic neuralgia are: elderly; extensive rash within 72 hours; severe/prolonged prodromal pain.
- c) See APC guidelines for treatment of neuropathic pain.
- d) Consider underlying immunosuppression secondary to HIV.

Chickenpox

Treatment should be considered:

If started <24hours of rash and >14 years or severe pain or dense/oral rash or secondary household case or steroids or smoker.

Aciclovir 800mg 5 times a day for 7 days

- a) Consider treatment in any adult seen within 24 hours of onset of disease.
- b) Severely affected individuals may need hospital admission.
- c) **Treatment is not generally indicated for immunocompetent children**, where the disease is usually milder. Chickenpox is occasionally lethal in adults.
- d) Secondary bacterial skin infections may occur.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Additional Notes: Chickenpox and Shingles****Pathogens:**Chickenpox – *Varicella zoster*Shingles – *Herpes Zoster***Clinical details:****Pregnant women or immunosuppressed individuals in contact with chicken pox or shingles:**

- Ask about history of chickenpox or shingles.
- Reassure those with definite clinical history of previous chickenpox that they are immune and are not at risk of re-infection.
- Those without a definite clinical history should be screened for immunity (10ml clotted blood to microbiology). For pregnant women, this test can be performed on stored 'booking' blood sample. Please contact microbiology. Note: approximately 50% of patients who do not have a history of chickenpox are in fact, immune. If found to be non-immune, then Varicella-zoster Immunoglobulin (VZIG) may be issued to reduce risk of severe infection providing the last contact was within 7-10 days. Advice will be given by a microbiologist, and then VZIG issue arranged.
- In pregnancy, VZIG may currently (depending on availability of supplies) be administered at any gestation.
- Neonates (first 7 days of life) born to non-immune mothers, and exposed to chicken pox should receive VZIG.
- Systemic therapy with aciclovir should be considered in patients who develop chickenpox despite VZIG, or present too late for VZIG treatment to be appropriate.

Cold Sores:

Cold sores resolve after 7 – 10 days without treatment. Topical antivirals applied prodromally reduce duration by 12-24 hours.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Gut Infections

The vast majority of infections are self-limiting and do not require systemic treatment

1st line:

Salmonella/Shigella /Campylobacter

ANTIBIOTICS RARELY REQUIRED

Ciprofloxacin 500mg bd for 3 days
(see help note)

NB : remember oral rehydration

**For known campylobacter infections,
Clarithromycin 250-500mg bd for 5-7 days if
treated early.**

Giardia Infection

Metronidazole 2g od for 3 days

Antibiotic Associated Diarrhoea

(caused by *Clostridium difficile*)

Stop offending antibiotic and / or PPI
where possible – see separate guidance on
following page.

Help Notes:

- a) In acute food poisoning, **avoid antibiotics.**
- b) Only treat with ciprofloxacin, where the patient is very systemically unwell, particularly the elderly/debilitated.
- c) Food poisoning cases are notifiable to CCDC in Health Protection Unit.
- d) Take stool cultures. This is particularly important for young children, patients who have been abroad, or have bloody diarrhoea.
- e) Enteric fevers (Typhoid/Paratyphoid): longer treatments are required as guided by microbiologists.
- f) **Cryptosporidium is a self-limiting infection with no proven treatment. Duration of diarrhoea may be longer than with other gut infections.**

NOTE: For *Helicobacter pylori* eradication - see BNF and NICE - Dyspepsia guidelines

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Clostridium difficile associated diarrhoea

Most commonly follows antibiotic use, and although often associated with hospital admission, may also follow antibiotic therapy in the community.

Stop offending antibiotic where possible and /or PPI – this may be sufficient to relieve symptoms in mild cases.

DO NOT USE anti-diarrhoeal agents (e.g. loperamide)

Mild/moderate cases
1st / 2nd episodes

Metronidazole 400mg tds
 Do NOT delay treatment pending stool testing if strong suspicion. If responding, continue for 14 days (relapse common if treatment stopped prematurely)
 If no improvement within 3-5 days change to Vancomycin orally, 125mg qds. If responding, continue for 14 days.

3rd episode Vancomycin 125mg qds for 14 days

Further relapses

Vancomycin 250mg for 14 days, then gradually reduce: 125mg qds for 1 week, then 125mg tds for 1 week, then 125mg bd for 1 week, then 125mg od for 1 week, then 125mg alternate days for 2 weeks, then 125mg every 3rd day for 2 weeks.

Admit if severe: T>38.5; WCC >15, rising creatinine or signs/symptoms of severe colitis

Help Notes:

- a) Send stool specimen whenever *C.difficile* suspected (recent hospital admission, antibiotic use, blood/mucus in stools)
- b) Whenever possible, avoid antibiotics in patients known to have had *C.difficile* disease. Ask for microbiology advice if antibiotics are necessary.
- c) Avoid use of cephalosporins, quinolones and clindamycin.
- d) **PPIs increase risk of C.diff.**
- e) Observe good infection control practice, particularly in community hospital and care home settings (refer to infection control policy)
- f) If patient requires hospital admission, inform admitting team if known or suspected to have *C.difficile* disease.
- g) Use of oral vancomycin does not require therapeutic drug monitoring.
- h) The use of probiotics as part of a balanced diet may be useful in relapsing disease.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Diverticulitis

1st line: Co-amoxiclav 625mg tds for at least 7 days.

2nd line: (if penicillin allergic)
Ciprofloxacin 500mg bd
AND
Metronidazole 400mg tds
for at least 7 days

Help Notes:

- a) Prescribe paracetamol for pain – nonsteroidal anti-inflammatory drugs (NSAIDs) and opioid analgesics have been identified as risk factors for diverticular perforation
- b) Recommend clear fluids only. Gradually reintroduce solid food as symptoms improve over 2-3 days.
- c) Always review patients within 48 hours or sooner if symptoms deteriorate. Arrange hospital admission if symptoms persist or deteriorate.
- d) When patients require admission, give appropriate IM analgesia for moderate to severe pain.
- e) Be aware of possible risk of *C.difficile* disease in patients taking antibiotics, particularly with the use of ciprofloxacin. Stop all antibiotics if diarrhoea develops.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Cholangitis**

Acute cholecystitis or cholangitis are potentially medical emergencies, and unwell patients should be urgently referred to hospital for confirmation of diagnosis, monitoring, surgical assessment, and intravenous fluids, antibiotics and analgesia.

Patients who are not unwell, or who have mild intermittent symptoms, may be considered for routine referral to hospital for out-patient assessment and further investigation. Whilst awaiting this referral, it may be appropriate to offer analgesia and oral antibiotics.

The commonest organisms causing biliary infection within the UK are *Klebsiella spp.*, *E.coli*, and streptococci (including enterococci). If antibiotic treatment is required, then appropriate choices are as follows:

1st line: Co-amoxiclav 625mg tds for 5 days

2nd line: For penicillin allergic patients:
Ciprofloxacin 500mg bd for 5 days

Help Notes:

If, at any point a patient deteriorates, then they should be referred immediately to hospital.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Eye Infections

**1st line:
If Severe**

Chloramphenicol 0.5% eye drops
2 hourly for 2 days, then 4 hourly
(whilst awake)
AND Chloramphenicol 1%
ointment at night
All for 48 hours after resolution

2nd line:

Fusidic acid 1% eye drops
bd for 48 hours after resolution

Chlamydia Eye Infection: Oral clarithromycin

Help Notes:

- a) **Many conjunctival infections are self-limiting** (64% resolve on placebo by day five).
- b) Evidence for blood dyscrasias due to topical chloramphenicol is sparse and is disputed.
- c) If the response is poor, take a swab specimen.
- d) Always take a swab specimen (using appropriate swab) from neonates up to 4 weeks old. Chlamydia may be the causative organism.
- e) If chlamydia or gonococci are detected, remember to treat the mother, and undertake contact tracing. Refer to GUM clinic for further assessment.
- f) Fusidic acid has a narrow spectrum – it does not have gram negative activity (*H. influenzae*)
- g) Contact lens users with frequent infections should be referred to ophthalmologists. Cleaning routine should be checked.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Splenectomy and Infection**

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

Summary of advice**Vaccination:**

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

Antibiotic prophylaxis:

Children < 5 years: phenoxymethylpenicillin 125mg bd

Children 5-12 years: phenoxymethylpenicillin 250 mg bd

Adults: amoxicillin 250mg daily

Erythromycin may be given to penicillin allergic patients: < 2years 125mg/day
2-8 years 250mg/day
> 8 years 250 – 500mg/day.

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

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Antimicrobial Prophylaxis****INFECTIVE ENDOCARDITIS**

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

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

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

See BNF and NICE Clinical Guideline for further details.

MALARIA

Malaria prophylaxis should not be prescribed on an NHS prescription form. Patients should be advised to purchase their medicines from a pharmacy. Mefloquine, doxycycline and malarone are “prescription only medicines” which should be provided on private prescription for malaria prophylaxis. GPs may charge patients for the prescribing or providing of drugs for malaria prophylaxis for travel abroad.

- Local community pharmacists have access to up to date advice about appropriate regimes and can advise travellers accordingly.
- Regular GP literature also provides updated advice on the choice of antimalarials for different regions of the world. Clinical Knowledge Summaries gives detailed practical advice on malaria prophylaxis. www.cks.nhs.uk
- The updated Guidelines for malaria prevention also available on
 - www.nathnac.org or www.travax.scot.nhs.uk (subscription needed)
- Alternatively the following telephone advice lines may be used:
 - Consultant in Infectious Diseases, Worcestershire Royal Hospital (see useful contact numbers on page 59)
 - Liverpool School of Tropical Medicine – 0151 708 9393 www.liv.ac.uk/lstm
 - Hospital for Tropical Diseases – 0845 1555 000 www.thehtd.org
 - Birmingham Heartlands Hospital – Malaria Helpline – 0121 424 2000

In any case of suspected malaria in a returning traveller: take 3 thick blood films, send EDTA blood sample to haematology for malaria screening. Contact Consultant in Infectious Diseases, Worcestershire Royal Hospital

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

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Meningitis

Treatment

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

Benzylpenicillin:

Age 10+ years	1.2g stat IV/IM
Children aged 1-9 years	600mg stat IV/IM
Children less than 1 year	300mg stat IV/IM

Cefotaxime:

Age 12+ years	1gram
Child < 12 years	50mg/kg

Chemoprophylaxis for close contacts (only when advised by HPA) – see help notes for further information

Ciprofloxacin – recommended for use in all age groups

Adults and children over 12 years	500mg by mouth as a single dose
Children 5 to 12 years	250mg by mouth as a single dose
Children 1 month to 4 years	125mg by mouth as a single dose

Rifampicin – recommended for use in all age groups

Adults and children over 12 years	600mg by mouth every twelve hours for 2 days
Children 1 to 12 years	10mg /kg (max 600mg) by mouth every twelve hours for 2 days
Children less than 1 year	5mg/kg by mouth every twelve hours for 2 days

In pregnancy and breastfeeding, specific advice will be given by the HPA.

Common Pathogen

Bacterial Meningitis: *Neisseria meningitidis* is the commonest. Others include *Haemophilus influenzae*, *Streptococcus pneumoniae*.

Viral Meningitis: Herpes simplex virus, enterovirus, adenovirus

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Meningitis

Help Notes

1. The most important course of action a general practitioner can take in the event of a suspected case of meningococcal infection is to arrange an emergency hospital admission by ambulance. Parenteral preadmission antibiotics may also be indicated.
2. Meningococcal meningitis and septicaemia are statutorily notifiable diseases: suspected cases are to be reported to the local on call CCDC or CPHM.
3. Identification of contacts will be carried out by the HPA/PH, although the supply of chemoprophylaxis may be through GPs or hospital clinicians following advice from the CCDC/CPHM.
4. Ciprofloxacin has a number of advantages over rifampicin because it is given as a single dose, does not interact with oral contraceptives, and is more readily available in community pharmacies. Ciprofloxacin is licensed in children over 1 year of age for specific indications, although not for meningitis prophylaxis in any age group. However, national HPA guidance now advocates its use in all ages for this indication.
5. Contact tracing should **only** include those individuals who have had prolonged close contact with the patient within the seven days preceding the onset of infection, regardless of immunisation status. These include anyone staying overnight in the same household as the patient within a week of the onset of symptoms, students sharing a kitchen within a hall of residence, pupils sharing a dormitory, and kissing contacts of the patient.
6. If two confirmed or suspected cases occur within the same play group / school / university within a four week period, the CCDC should be informed immediately, as more extensive contact tracing and treatment with antibiotic prophylaxis may be required.
7. Discuss with the HPA regarding future vaccinations of index cases and contacts.

Clinical details

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

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Sepsis

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

Inoculation incidents

Refer to the Infection Control Policy for full protocol and supporting documentation available on the Worcestershire Health Services Website www.worcestershirehealth.nhs.uk / infection control services / policies and procedures / appendix I: blood borne contamination incident policy.

1. First aid to wound – encourage bleeding of puncture site under running water.
2. Make risk assessment. (e.g. greater risk if hollow bore needle containing blood, from source at high risk of blood borne virus infection)
3. If at all possible, obtain blood from source, and consent for testing for Hepatitis B & C, and HIV.
4. Take blood from victim for storage.
5. If high risk of HIV infection, contact medical microbiologist urgently to discuss post-exposure prophylaxis.
6. Ascertain Hepatitis B immune status of the victim. Most health care workers will have been immunised, and should be aware of their status.
7. If not previously vaccinated, give first dose of Hepatitis B vaccine promptly, with arrangement made to give follow-up doses. Refer to 'Immunisation against infectious disease 2006' for further details of accelerated schedules. www.dh.gov.uk/en/Policyandguidance/Healthandsocialcaretopics/Greenbook/DH_4097254. If incident high risk for Hepatitis B acquisition, arrange to administer Hepatitis B immunoglobulin.
8. If vaccine non-responder, and high risk of Hepatitis B, contact microbiologist for advice regarding Hepatitis B specific immunoglobulin.
9. If source blood unknown, or known to be Hepatitis C positive, ensure victim understands that they need to return for hepatitis C PCR testing at 6 weeks post-incident and follow-up serology at 3 months.

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING**Useful Contact Numbers**

Tuberculosis:	Dr M. Roberts, Clinical lead for TB on 01562 513072 or ext. 53436 or via pager at WRH switchboard. Prof. R. Lewis/ Dr. S. O’Hickey / Dr. S. Woolley, WRH 01905 763333, ext. 33991 (Prof Lewis) OR 01905 760240 (Dr O’Hickey) OR 01905 733778 (Dr Woolley) Dr. S. Vathenan / Dr. D. Brocklebank Alexandra Hospital, Redditch 01527 503881 Bleep via switchboard Dr. G. Summers, Kidderminster Hospital 01562 823424 Ext. 53353 or 01562 826355
Meningococcal Meningitis & Whooping Cough	Health Protection Agency 01562 756300
HIV /AIDS/Malaria:	Dr. M. Roberts, Consultant in Infectious Diseases, 01562 8513072 or WRH ext. 53436 or via pager at WRH switchboard Dr M. Ling, Consultant in Infectious Diseases, Worcestershire Royal Hospital via bleep
Microbiological Advice and Needle-stick injury :	Dr. J. Stockley } Worcestershire Royal Hospital 01905 763333 ext. 39206 Dr. C. Constantine } Dr. C Catchpole } Dr A Dyas } Alexandra Hospital, Redditch 01527 503030 ext 44008
Current Parasite Policy:	Health Protection Agency, 01562 756300
Infection Control:	Based at Evesham Community Hospital. 01386 502552

GUIDELINES FOR PRIMARY CARE ANTIMICROBIAL PRESCRIBING

Location of HIV prophylaxis packs:

A&E Department and Emergency Drug Cupboard at Worcester Royal Hospital

John Anthony Centre, Worcester

Malvern Community Hospital

A&E Department and the Arrowside Unit, Alexandra Hospital, Redditch

Minor Injuries Units at the following Community Hospitals: Evesham, Kidderminster, Tenbury and Princess of Wales Hospital, Bromsgrove

Location of Meningitis chemoprophylaxis packs (ciprofloxacin tablets and rifampicin syrup):

A&E department and Emergency Drug Cupboard, Worcester Royal Hospital

Emergency Cupboard, Alexandra Hospital, Redditch

REFERENCES

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

British National Formulary (BNF) issue 60 www.bnf.org : BNF for Children 2010-2011: Scottish Intercollegiate Guidelines Network (SIGN)

www.sign.ac.uk : MeReC www.npc.co.uk : Prodigy www.cks.library.nhs.uk : National Institute for Health and Clinical Excellence

www.nice.org.uk : Summary of Product Characteristics www.medicines.org.uk : Immunisation against Infectious Disease

www.dh.gov.uk/en/Policyandguidance/Healthandsocialcaretopics/Greenbook/DH_4097254: British Association for Sexual Health and HIV

(BASHH) www.bashh.org : Management of infection guidance for primary care, HPA July 2010

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