

Antimicrobial Guidelines

for Primary Care

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**Adapted from the HPA / BIA
Management of infection
guidance for primary care.**

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Guidelines on the Management of Infections in Primary Care

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

1. This guidance is based on the best available evidence 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.
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. In children erythromycin may be preferable as clarithromycin syrup is twice the cost.
11. Where a 'best guess' therapy has failed or special circumstances exist, microbiological advice can be obtained from:
 - **Cumbria & Lancashire Health Protection Unit**
01257 246450
 - **Consultant Microbiologists at East Lancashire Hospitals NHS Trust (including out of hours)**
Blackburn - **01254 263555** (*Switchboard*)
Burnley - **01282 425071** (*Switchboard*)

Clostridium Difficile Infection: Best practice in antimicrobial drug prescribing

Clostridium difficile infection (CDI) is associated with antimicrobial use.

Prescribing antimicrobials wisely can reduce the incidence.

Clostridium difficile infection (CDI)

- *C. difficile* is a bacterium present in the gut flora in some people.
- Antimicrobials disturb the balance of the gut flora, allowing *C. difficile* to multiply and cause infection.
- Symptoms of CDI can vary from mild diarrhoea to fatal bowel inflammation.
- *C. difficile* spores are shed in the faeces. The spores can survive for long periods in the environment. If ingested, they can transmit infection to others.

Prudent antimicrobial prescribing

- Only prescribe antimicrobials when indicated by the clinical condition of the patient or the results of microbiological investigation.
- Do not prescribe antimicrobials for sore throat, coughs and colds in patients at low risk of complications.
- Consider delayed prescriptions in case symptoms worsen or become prolonged.
- If an antimicrobial is required, follow local guidelines.
- Choose a narrow-spectrum agent where possible and prescribe a short course.
- Generally, no more than 5-7 days' treatment is required.
- Three-day courses are appropriate in some cases.
- Broad-spectrum antimicrobials should be reserved for the treatment of serious infections when the pathogen is not known.

Antimicrobials to avoid where possible

The antimicrobials most strongly associated with CDI are:

- Second and third generation cephalosporins: cefaclor, cefuroxime, cefixime and cefpodoxime are examples for oral use
- Clindamycin
- Quinolones (*associated with the virulent 027 strain of C. difficile*): ciprofloxacin, levofloxacin, moxifloxacin, ofloxacin, norfloxacin.
- Long courses of amoxicillin, ampicillin, co-amoxiclav or co-fluampicil.

Antimicrobials to choose

- All antimicrobials are associated with CDI, but those with lower risk are trimethoprim, penicillin V, tetracyclines and aminoglycosides.
- If antimicrobials are required, prescribe a short course and follow the local formulary.
- Where therapy has failed or there are special circumstances, obtain advice from a local microbiologist.

CDI and primary care

- CDI has commonly been associated with hospital stay but it is being recognised that many cases originate in the community, due to indiscriminate use of antibiotics.
- Patients most at risk are the elderly, particularly if they have medical conditions and are in close contact with others, e.g. in a care home, residential treatment centre or hospital.

How we use antimicrobials affects the whole community

Which patients are most at risk of CDI?

Patients are more at risk of CDI if they are:

- Elderly
- Suffering from severe underlying diseases
- Immunocompromised
- In an environment where they are in close contact with one another (*e.g. in a care home*), particularly if hygiene is lacking.

Other factors that increase the risk of CDI are:

- Use of antimicrobials
- Recent gastrointestinal procedures
- Presence of a nasogastric tube

The use of proton pump inhibitors (*PPIs*) might increase the risk of CDI. Only prescribe PPIs when indicated.

Reducing the risk of CDI

Prudent antimicrobial prescribing

- Broad-spectrum antimicrobials are strongly associated with CDI.

Isolating infected patients

- Isolating patients with CDI reduces the spread of infection in care homes and other places where people are in close contact with one another.

Good hygiene

- Everyone should wash their hands with soap and water before and after each contact with a CDI-infected patient, including at home.
- Alcohol gel is effective against MRSA but not against *C. difficile* spores.
- The National Patient Safety Agency's Clean Your Hands campaign has been rolled out to primary care - see www.npsa.nhs.uk/cleanyourhands.
- Carers of CDI-infected patients should wear gloves and aprons.

When can broad-spectrum antibiotics be recommended?

There are few indications for broad-spectrum cephalosporins or quinolones in primary care. The following situations are the only indications for their first-line use.

Acute pyelonephritis	Co-amoxiclav (<i>or ciprofloxacin in penicillin allergy</i>)
Simple gonorrhoea (<i>refer to GUM</i>)	Cefixime or ciprofloxacin single dose
Animal bite or human bite	Co-amoxiclav
Suspected meningitis in penicillin-allergic patient	Cefotaxime
Pelvic Inflammatory Disease	Ofloxacin (<i>with metronidazole</i>)
Prostatitis	Ciprofloxacin or Ofloxacin

When using broad spectrum antimicrobials, counsel patients at risk to be alert for signs of CDI and to stop their antimicrobial and seek medical help if diarrhoea develops.

Bottom line

Clindamycin and broad spectrum antimicrobials are associated with CDI.

Don't prescribe antimicrobials when they're not needed.

If an antimicrobial is indicated, prescribe a short course of a narrow-spectrum agent at the appropriate dose, as outlined in the PCT antimicrobial formulary.

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Supporting Medicines Q&A documents are available at www.nelm.nhs.uk/en/NeLM-Area/Evidence/Medicines-Q-A/

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RESPIRATORY TRACT INFECTIONS

At the first face-to-face contact in primary care, including walk-in centres and emergency departments, offer a clinical assessment, including: history (presenting symptoms, use of over-the-counter or self medication, previous medical history, relevant risk factors, relevant comorbidities) and examination as needed to establish diagnosis. Address patients' or parents'/carers' concerns and expectations when agreeing the use of the three antibiotic strategies: No prescribing, Delayed Prescribing or Immediate Prescribing.

For all patients with acute otitis media, acute sore throat/acute pharyngitis/acute tonsillitis, common cold, acute rhinosinusitis or acute cough/acute bronchitis stratify management depending on level of risk of complications

Lower risk of complications

Agree a no antibiotic or delayed antibiotic prescribing strategy for patients with acute otitis media, acute sore throat/acute pharyngitis/acute tonsillitis, common cold, acute rhinosinusitis or acute cough/acute bronchitis. If all patients with an upper respiratory tract infection were treated with an antibiotic, it would be necessary to treat over 4000 patients with an antibiotic to prevent one case of pneumonia.

No antibiotic prescribing

Offer patients:

- reassurance that antibiotics are not needed immediately because they will make little difference to symptoms and may have side effects, for example, diarrhoea, vomiting and rash. For every 17 patients treated with an antibiotic, one will suffer a side effect such as vomiting, rash or diarrhoea, which could be as debilitating as the illness they originally presented with.
- a clinical review if the RTI worsens or becomes prolonged. Give advice on the average natural length of illness – see below.

Delayed antibiotic prescribing

Offer patients:

- reassurance that antibiotics are not needed immediately because they will make little difference to symptoms and may have side effects, for example, diarrhoea, vomiting and rash For every 17 patients treated with an antibiotic, one will suffer a side effect such as vomiting, rash or diarrhoea, which could be as debilitating as the illness they originally presented with.
- advice about using the delayed prescription if symptoms do not settle or get significantly worse. Give advice on the average natural length of illness – see opposite.
- advice about re-consulting if symptoms get significantly worse despite using the delayed prescription.

The delayed prescription with instructions would be better collected at a later date – but could be given to the patient at the time of consultation.

Intermediate risk of complications

No antibiotic, delayed antibiotic as outlined opposite.

Consider immediate antibiotic prescribing

Depending on clinical assessment of severity, also consider an immediate prescribing strategy for:

- children younger than 2 years with bilateral acute otitis media
- children with otorrhoea who have acute otitis media
- patients with acute sore throat/acute pharyngitis/acute tonsillitis when three or more Centor criteria are present. Centor criteria are: presence of tonsillar exudate, tender anterior cervical lymphadenopathy or lymphadenitis, history of fever and an absence of cough.

Higher risk of complications

Immediate antibiotic prescribing or further investigation and/or management

Offer immediate antibiotics or further investigation/management for patients who:

- are systemically **very** unwell
- have symptoms and signs suggestive of serious illness and/or complications (particularly pneumonia, mastoiditis, peritonsillar abscess, peritonsillar cellulitis, intraorbital or intracranial complications)
- are at high risk of serious complications because of pre-existing comorbidity. This includes patients with significant heart, lung, renal, liver or neuromuscular disease, immunosuppression, cystic fibrosis, and young children who were born prematurely
- are older than 65 years with ACUTE COUGH and two or more of the following:
 - hospitalisation in previous year
 - type 1 or type 2 diabetes
 - history of congestive heart failure
 - current use of oral glucocorticoids
 - older than 80yrs

Offer all patients:

Advice about the usual natural history of the illness and average total illness length:

- acute otitis media: **4 days**
- acute sore throat/acute pharyngitis/acute tonsillitis: **1 week**
- common cold: **1½ weeks**
- acute rhinosinusitis: **2½ weeks**
- acute cough/acute bronchitis: **3 weeks**
- advice about managing symptoms including fever (*particularly analgesics and antipyretics*).

For information about fever in children younger than 5 years, refer to 'Feverish illness in children' (NICE clinical guideline 47).

Illness	Drug	Dose	Duration of Tx
Pharyngitis/sore throat/tonsillitis (Ref: www.cks.nhs.uk , SIGN) Avoid antibiotics routinely as 90% resolve in 7 days without, and pain only reduced by 16 hours. If 3 or 4 of the following are present (<i>Lymphadenopathy; No Cough; Fever; Tonsillar Exudate</i>) consider immediate antibiotics. Antibiotics to prevent Quinsy NNT >4000 Antibiotics to prevent Otitis media NNT= 200	First line Penicillin V (= Phenoxyethylpenicillin)	1 gram twice daily or 500mg four times daily if severe	10 days
	<i>If allergic to penicillin</i> Clarithromycin	500mg twice daily	10 days
Otitis media (child doses) Use ibuprofen or paracetamol as well (Ref: www.cks.nhs.uk) Avoid antibiotics routinely as 60% are better in 24 hours without: they only reduce pain at 2 days (NNT=15) and do not prevent deafness. Consider immediate antibiotics if either: < 2yrs with bilateral otitis media (NNT=4) or All ages with otorrhoea (NNT=3)	First line Amoxicillin	40mg/kg/day in 3 divided doses (total divided into 3 doses) Maximum 1g three times daily	5 days
	Second line or if allergic to penicillin Clarithromycin (Haemophilus is an extracellular pathogen, thus macrolides, which concentrate intracellularly, are less effective treatment)	Child 1 month-12 years dose by body weight < 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 12-18 years 250mg twice daily	5 days
Rhinosinusitis, acute or chronic (Ref: www.cks.nhs.uk) Avoid antibiotics as 80% resolve in 14 days without, and they only offer marginal benefit after 7 days (NNT=15) Use adequate analgesia. Consider 7-day delayed or immediate antibiotic when purulent nasal discharge (NNT=8) In persistent infection use an agent with anti-anaerobic activity eg. co-amoxiclav.	First line Amoxicillin	500mg three times daily or 1 gram three times daily if severe	7 days
	Second line Doxycycline	200mg on first day, then 100mg daily	7 days
	<i>If unable to use doxycycline, or if persistent symptoms</i> Co-amoxiclav	625mg three times daily	7 days
Acute cough, bronchitis (Ref: www.cks.nhs.uk) Antibiotic little benefit if no co-morbidity. Consider immediate antibiotics if older than 65 years with ACUTE COUGH and two or more of the following: • hospitalisation in previous year • type 1 or type 2 diabetes • history of congestive heart failure • current use of oral glucocorticoids • older than 80yrs. Symptom resolution can take 3 weeks. For other patients consider 7-14 day delayed antibiotic with symptomatic advice/leaflet.	First line Amoxicillin	500mg three times daily	5 days
	Second line or if allergic to penicillin Doxycycline	200mg on first day, then 100mg daily	5 days

Illness	Comments	Drug	Dose	Duration of Tx
Other Respiratory Tract Infections:				
Note: Avoid tetracyclines in pregnancy. Low doses of penicillins are more likely to select out resistance. The quinolones ciprofloxacin and ofloxacin have poor activity against pneumococci. However, they do have use in PROVEN pseudomonal infections. Levofloxacin has some anti-Gram-positive activity but should not be needed as first line treatment.				
Influenza (Ref: Influenza HPA, NICE)	Annual vaccination is essential for all those at risk of influenza. For otherwise healthy adults, antivirals are not recommended. Post Exposure Prophylaxis: Offer post exposure prophylaxis to patients in the same household/residential setting as an index case IF: only when the Department of Health states that influenza is circulating in the community, are in one of the 'At Risk' groups: 65 years or over, chronic respiratory disease (including COPD and asthma) significant cardiovascular disease (not hypertension), immunocompromised, diabetes mellitus, chronic renal disease and chronic liver disease, AND patients have not been vaccinated, and prophylaxis offered within 36 hours of contact with an index case for zanamivir and within 48 hours of contact for oseltamivir. Give oseltamivir 75mg capsule orally daily for 10 days, or zanamivir 10mg (2 inhalations by diskhaler) daily for 10 days. Treatment of Influenza: Offer influenza treatment to patients only when the Department of Health states that influenza is circulating in the community, are 'At Risk' as defined above, AND patients have not been vaccinated, and treatment offered within 48 hours of onset. Give oseltamivir 75mg capsule orally twice daily for 5 days, or zanamivir 10mg (2 inhalations by diskhaler) twice daily for 5 days.			
Infected exacerbation of COPD (Ref: NICE, GOLD)	Treat exacerbations promptly with oral steroids, and only add antibiotics if purulent sputum and either increased shortness of breath (SOB) and/or increased sputum volume present. If increased SOB and no purulent sputum, then consider oral steroids without antibiotics. <i>Risk factors for antibiotic resistant organisms include co-morbid disease, severe COPD, frequent exacerbations, antibiotics in last 3 months.</i>	First line Amoxicillin	500mg three times daily	5 days
		First line alternative Doxycycline	200mg on first day, then 100mg daily	5 days
		<i>If allergic to penicillin & unable to use doxycycline</i> Clarithromycin	500mg twice daily	5 days
		<i>If resistance risk factors:</i> Co-amoxiclav	625mg three times daily	5-7 days
Community-acquired pneumonia - ONLY when treatment in the community is appropriate (Ref: BTS, BTS pdf)	Use CRB65 score to help guide and review: Each scores 1 point: Confusion (AMT<8) Respiratory rate >30/min BP systolic <90 BP diastolic ≤ 60 Add the scores together: Score 0: suitable for home treatment; Score 1-2: hospital assessment or admission Score 3-4: urgent hospital admission Give immediate IM benzylpenicillin or amoxicillin 1G orally if delayed admission/life threatening. Mycoplasma infection is rare in over 65s.	IF CRB65=0: amoxicillin or clarithromycin or doxycycline	500mg three times daily 500mg twice daily 200mg on first day, then 100mg daily	7-10 days 7-10 days 7-10 days
		IF CRB65=1 & AT HOME: amoxicillin or clarithromycin or doxycycline	500mg three times daily 500mg twice daily 200mg on first day, then 100mg daily	7-10 days 7-10 days 7-10 days

Illness	Comments	Drug	Dose	Duration of Tx
Meningitis:				
Suspected meningococcal disease (Ref: HPA pdf)	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)	IV (or IM) Benzylpenicillin	Adults and children 10 years and over: 1200mg Children 1 - 9 years: 600mg Children <1 year: 300mg	
	By intravenous injection (or by intramuscular injection if venous access not available)	If history of allergy to penicillin IV (or IM) Cefotaxime injection	Neonate 50mg/kg Child 1 month–12 yrs: 50mg/kg (max. 1g) Child 12–18 years: 1g Adult: 1g	

Prevention of secondary case of meningitis: Only prescribe following advice from Health Protection Unit: See front page for contact numbers.

Urinary Tract Infections: (Ref: HPA UTI quick reference guidance, ESBLs, www.cks.nhs.uk, NICE)

Note: Amoxicillin resistance is common, therefore ONLY use if culture confirms susceptibility. In the elderly (>65 years), do not treat asymptomatic bacteriuria; it occurs in 25% of women and 10% of men and is not associated with increased morbidity. In the presence of a catheter, antibiotics will not eradicate bacteriuria; only treat if systemically unwell or pyelonephritis likely. Cefalexin is NOT included as a second line agent – risk of Clostridium difficile with cefalexin is high. Do not use prophylactic antibiotics for catheter changes unless history of catheter-change-associated UTI.

Uncomplicated UTI i.e. no fever or flank pain in men or women (Ref: HPA, SIGN, CKS)	Women with severe/≥ 3 symptoms: treat. Women with mild/ ≤ 2 symptoms: use dipstick to guide treatment. Nitrite & blood/leucocytes has 92% positive predictive value ; negative nitrite, leucocytes, and blood has a 76% negative predictive value. Men: send pre-treatment MSU OR if symptoms mild/ non-specific, use negative nitrite and leucocytes to exclude UTI. There is less relapse with trimethoprim than cephalosporins. Trimethoprim must NOT be used in patients taking Methotrexate. Community multi-resistant E. coli with Extended-spectrum Beta-lactamase enzymes (www.hpa.org.uk/infections/topics_az/esbl/default.htm) are increasing so perform culture in all treatment failures. ESBLs are multi-resistant but may retain sensitivity to nitrofurantoin	First line Trimethoprim	200mg twice daily	3 days (Give a 7 day course in men)
		OR Nitrofurantoin	100mg modified release (m/r) twice daily	3 days (Give a 7 day course in men)
		Second line depends on susceptibility of organism isolated e.g. Nitrofurantoin, Amoxicillin or Co-amoxiclav		

Illness	Comments	Drug	Dose	Duration of Tx
UTI in pregnancy	Send MSU for culture & sensitivity and start empirical antibiotics. Short-term use of nitrofurantoin in pregnancy is unlikely to cause problems to the foetus. Avoid near term where possible. Avoid trimethoprim if low folate status or on folate antagonist (eg antiepileptic or proguanil). Give folic acid if used in first trimester. Trimethoprim must NOT be used in patients taking Methotrexate.	First or second trimester Nitrofurantoin	100mg modified release (m/r) twice daily	7 days
		Second or third trimester Trimethoprim	200mg twice daily (unlicensed)	7 days
		<i>Use the other first line agent if suitable,</i> or amoxicillin if sensitive otherwise use cefalexin	500mg three times daily 500mg twice daily	7 days 7 days

Children - Urinary tract infection - Diagnosis & Referral or Treatment strategy

NICE Clinical Guideline. Urinary tract infection in children: diagnosis, treatment and long-term management.

Infants and children with symptoms and signs suggestive of urinary tract infection (UTI) should have a urine sample tested for infection. Those presenting with unexplained fever of 38°C or higher should have a urine sample tested after 24 hours at the latest.

The table on below is a guide to the symptoms and signs that infants and children present with.

Table 1 Presenting symptoms and signs in infants and children with UTI

Age group		Symptoms and signs	
		Most common	Least common
Infants younger than 3 months		Fever Vomiting Lethargy Irritability	Poor feeding Failure to thrive Abdominal pain Jaundice Haematuria Offensive urine
Infants and children, 3 months or older	Preverbal	Fever	Abdominal pain Loin tenderness Vomiting Poor feeding Lethargy Irritability Haematuria Offensive urine Failure to thrive
	Verbal	Frequency Dysuria	Dysfunctional voiding Changes to continence Abdominal pain Loin tenderness Fever Malaise Vomiting Haematuria Offensive urine Cloudy urine

However, infants and children with an alternative site of infection should not have a urine sample tested routinely. When infants and children with an alternative site of infection remain unwell, urine testing should be considered after 24 hours at the latest.

In an infant or child with a high risk of serious illness it is highly preferable that a urine sample is obtained; however, treatment should not be delayed if a urine sample is unobtainable.

Illness	Comments	Drug	Dose	Duration of Tx
<p>Children - Urinary tract infection - Diagnosis & Referral or Treatment strategy</p> <p>Continued</p>	<p>A clean catch urine sample is the recommended method for urine collection. The following risk factors for UTI and serious underlying pathology should be recorded:</p> <ul style="list-style-type: none"> • poor urine flow • recurrent fever of uncertain origin • family history of vesicoureteric reflux (VUR) or renal disease • dysfunctional voiding • abdominal mass • poor growth <p>Infants younger than 3 months with a possible UTI should be referred immediately to the care of a paediatric specialist. Treatment should be with parenteral antibiotics.</p> <p>For infants and children 3 months or older with acute pyelonephritis/upper urinary tract infection consider referral to a paediatric specialist to be treated with oral antibiotics for 7–10 days. (The use of an oral antibiotic with low resistance patterns is recommended, for example co-amoxiclav)</p> <p>For infants and children 3 months or older with cystitis/lower urinary tract infection:</p> <ul style="list-style-type: none"> • treat with oral antibiotics for 3 days. • the parents or carers should be advised to bring the infant or child for reassessment if the infant or child is still unwell after 24–48 hours. If an alternative diagnosis is not made, a urine sample should be sent for culture to identify the presence of bacteria and determine antibiotic sensitivity if urine culture has not already been carried out. <p>Antibiotic prophylaxis should not be routinely recommended in infants and children following first-time UTI. Infants and children who have had a UTI should be imaged.</p>			
<p>Children - Lower urinary tract infection - Drug choice in primary care</p> <p>(see above for diagnosis)</p>	<p>See abbreviated NICE guidance above regarding referral or treatment strategy.</p> <p>Trimethoprim must NOT be used in patients taking Methotrexate.</p>	<p>First line Trimethoprim</p> <p>OR Nitrofurantoin</p> <p><i>If susceptible,</i> Amoxicillin</p>	<p>1 month - 18 years 4mg/kg (max 200mg) twice daily</p> <p>3 months - 12 years 750micrograms/kg four times daily</p> <p>1 month - 1 year 62.5mg three times daily</p> <p>1 - 5 years 125mg three times daily</p> <p>5 - 18 years 250mg three times daily (All doses can be doubled in severe infections)</p>	<p>3 days</p> <p>3 days</p> <p>3 days</p>

Illness	Comments	Drug	Dose	Duration of Treatment
Acute pyelonephritis	<p>If admission not needed, send MSU for culture & sensitivities and start antibiotics. A recent RCT showed 7 days ciprofloxacin was as good as 14 days co-trimoxazole.</p> <p>If no response within 24 hours admit.</p> <p>Trimethoprim must NOT be used in patients taking Methotrexate.</p>	Co-amoxiclav	625mg three times daily	Review culture results within 48hrs. Change to alternative antibiotic based on culture results. 14 days in total.
		<i>If susceptible</i> Trimethoprim	200mg twice daily	14 days in total
		<i>Only if allergic to penicillin,</i> Ciprofloxacin	500mg twice daily	7 days
Recurrent (≥ 3/yr) UTI women	Post coital prophylaxis is as effective as prophylaxis taken nightly. Prophylactic doses.	Nitrofurantoin	50mg - 100mg at night or post coital	
		OR Trimethoprim	100mg at night or post coital	

Gastro-intestinal Tract Infections:

<p>Eradication of <i>Helicobacter pylori</i></p> <p>(Ref: NICE, <i>Helicobacter</i> Selgrad M et al. <i>Curr Opin Gastroenterol</i> 2009; 25 (6): 549-556. Malfertheiner P et al. <i>Gut</i> 2007; 56:772-81.)</p> <p>Managing symptomatic relapse</p>	<p>Indications for eradication therapy: DU, GU, low grade MALT Lymphoma, atrophic gastritis, ITP, gastric cancer, and iron deficiency anaemia, first-degree relatives with gastric cancer, long-term NSAID therapy in complicated or uncomplicated DU/GU once healed. Consider 'test and treat' in: persistent uncomplicated dyspepsia. Do not offer eradication for GORD.</p> <p>Do not use clarithromycin or metronidazole if used in the past year for any infection.</p> <p>Failure of first line eradication therapy Alarm upper GI symptoms refer for urgent OGD. Factors causing failure of eradication therapy: antibiotic resistance, compliance, smoking, non-ulcer status. DU relapse: H2RA for 8-12 weeks then retest for H. pylori (urea breath test, stool antigen test). GU relapse: PPI for 4-8 weeks and OGD and biopsy. NUD: trial PPI/H2RA, no response trial of domperidone and lifestyle for dysmotility dyspepsia. Consider referral after first or subsequent treatment failure.</p>	First Line (and for those on warfarin) Lansoprazole Clarithromycin Amoxicillin	30mg twice daily 500mg twice daily 1gram twice daily	All for 7 days
		<i>Alternative if allergic to penicillin</i> Lansoprazole PLUS Metronidazole AND Clarithromycin	30mg twice daily 400mg twice daily 250mg twice daily	All for 7 days
		Second line (Consider referral to specialist if failed first line treatment) Omeprazole Bismuthate (DE-NOL tabs) Metronidazole Oxytetracycline hydrochloride	40mg twice daily 240mg twice daily 400mg twice daily 500mg four times daily	14 days in relapse or maltoma

Illness	Comments	Drug	Dose	Duration of Treatment
Gastroenteritis (Ref: www.cks.nhs.uk)	Fluid replacement essential. Antibiotic therapy is not usually indicated as it only reduces diarrhoea by 1-2 days and can cause antibiotic resistance. Refer previously healthy children with acute painful or bloody diarrhoea to exclude E. coli 0157 infection. Antibiotic therapy not indicated unless systemically unwell. If systemically unwell and campylobacter suspected (e.g. <i>undercooked meat and abdominal pain</i>), consider clarithromycin 250–500 mg BD for 5–7 days if treated early. Notify and seek advice on exclusion of patients from Health Protection Unit: See front page for contact numbers.			
Clostridium difficile	If history and symptoms are indicative of Clostridium difficile infection (e.g. post antibiotic), please treat as per Clostridium difficile guidelines (go to www.bwdpct.nhs.uk or www.eastlancspct.nhs.uk and click on 'Policies & Procedures') and notify the PCT Infection Control Nurse.			
Traveller's diarrhoea	Only consider standby antibiotics for remote areas or people at high-risk of severe illness with travellers' diarrhoea. If standby treatment appropriate give: ciprofloxacin 500 mg twice a day for 3 days (<i>private prescription</i>). If quinolone resistance high (e.g. <i>south Asia</i>): consider bismuth subsalicylate (<i>Pepto Bismol</i>) 2 tablets QDS as prophylaxis or for 2 days treatment.			
Threadworms (Ref: www.cks.nhs.uk)	Treat all household contacts at the same time PLUS advise hygiene measures for 2 weeks (<i>hand hygiene, pants at night, morning shower</i>) PLUS wash sleepwear, bed linen, dust, and vacuum on day one.	Mebendazole (<i>Adults & children over 6 months [off-label when used <2yrs age]</i>)	100mg single dose (<i>A second tablet can be taken after two weeks, if re-infection is suspected</i>)	Single dose
		Or piperazine in children 3-6 months. If <3months use hygiene measures only for 6 weeks.	3-6 months 2.5ml spoon	Single dose, repeat after 2 weeks

Genital Tract Infections - UK National Guidelines: (Ref: HPA, Vaginal discharge quick reference guide, BASHH)

Note: People with risk factors should be screened for chlamydia, gonorrhoea, HIV, syphilis. Refer individual and partners to GUM service. Risk factors: < 25yrs age, no condom use, recent (<12mth)/frequent change of partner, symptomatic partner.

Vaginal candidiasis	All topical and oral azoles give 75% cure. In pregnancy: avoid oral azole and use intravaginal treatment for 7 days.	Clotrimazole	500mg pessary	Single dose
		OR Fluconazole	150mg orally	Single dose
Bacterial vaginosis	A 7 day course of oral Metronidazole is slightly more effective than 2g single dose. Avoid 2g single dose in pregnancy/breastfeeding. Topical treatment gives similar cure rates but is more expensive. Treating partners does not reduce relapse.	Metronidazole	400mg twice daily or 2g single dose	7 days
		OR Metronidazole 0.75% vaginal gel	5g applicatorful at night	5 days
		OR Clindamycin 2% vaginal cream	5g applicatorful at night	7 days
Chlamydia trachomatis (Ref: HPA, Chlamydia quick reference guide)	Opportunistically screen all aged 15-25yrs. Treat partners and refer to GUM service. Pregnancy or breastfeeding: azithromycin is the most effective option [but off-label]. Doxycycline is contra-indicated. Alternative is 7 day course with erythromycin or amoxicillin. Due to lower cure rate in pregnancy, test for cure 6 weeks after treatment.	Azithromycin	1g stat	Single dose 1 hr before or 2 hrs after food
		OR Doxycycline	100mg twice daily	7 days

Illness	Comments	Drug	Dose	Duration of Treatment
Trichomoniasis	Refer to sexual health clinic. Treat partners simultaneously. In pregnancy /breastfeeding avoid 2g single dose of Metronidazole. Topical clotrimazole cream gives symptomatic relief only (not cure).	Metronidazole	400mg twice daily or 2g in single dose	5-7 days
		Clotrimazole	100mg pessary	6 days
Pelvic Inflammatory Disease (PID)	Essential to test for <i>N. gonorrhoea</i> (as increasing antibiotic resistance) and chlamydia. 28% of gonorrhoea isolates now resistant to quinolones (e.g. ofloxacin). If gonorrhoea likely (partner has it, severe symptoms, sex abroad) avoid ofloxacin regimen. Microbiological and clinical cure are greater with ofloxacin than with doxycycline. Refer contacts to sexual health clinic	First line Metronidazole Ofloxacin	400mg twice daily 400mg twice daily	14 days 14 days
		Alternative Metronidazole Doxycycline	400mg twice daily 100mg twice daily	14 days 14 days
		Cefixime	400mg	Single dose
Acute prostatitis	Send MSU for culture and start antibiotics. 4-wk course may prevent chronic prostatitis Quinolones (e.g. ciprofloxacin/ofloxacin) achieve higher prostate levels. Trimethoprim must NOT be used in patients taking Methotrexate.	First line Ciprofloxacin OR Ofloxacin	500mg twice daily or 200mg twice daily	28 days 28 days
		Second line trimethoprim	200mg twice daily	28 days

Skin / Soft Tissue Infections:

Panton-Valentine Leukocidin (PVL) is a toxin produced by 2% of *Staphylococcus aureus* and is associated with persistent recurrent pustules and carbuncles or cellulitis. Send swabs for culture in these clinical scenarios. On rare occasions it causes more severe invasive infections, even in otherwise fit people. Risk factors include: nursing homes, contact sports, sharing equipment, poor hygiene and eczema.

Impetigo (Ref: www.cks.nhs.uk)	As resistance is increasing reserve topical antibiotics for very localised lesions. Reserve Mupirocin for MRSA only. Do not use topical antibiotics for extensive, severe, or bullous impetigo, use oral antibiotics.	First line Flucloxacillin	500mg four times daily	5-7 days
		<i>If allergic to penicillin</i> Clarithromycin	500mg twice daily	5-7 days
Eczema (Ref: www.cks.nhs.uk)	If no visible signs of infection, use of antibiotics (<i>alone or with steroids</i>) encourages resistance and does not improve healing. In eczema with visible signs of infection, use treatment as in impetigo.			

Illness	Comments	Drug	Dose	Duration of Treatment
Cellulitis	<p>If patient afebrile and healthy other than cellulitis flucloxacillin may be used as single drug treatment. If river or sea water exposure, discuss with microbiologist. If febrile and ill, admit for IV treatment. Ensure appropriate dose of antibiotic prescribed.</p> <p>If Clindamycin is prescribed please ensure that patient is counselled that if they experience any abdominal pain or diarrhoea that they should stop treatment and seek advice immediately due to higher risk of C.difficile infection.</p> <p>In facial cellulitis use co-amoxiclav.</p>	<i>First line</i> Flucloxacillin	500mg four times daily	5 days then review. Then continue for at least 48 hours after redness has subsided.
		<i>If allergic to penicillin</i> Clarithromycin	500mg twice daily	
		<i>Second line only or if spreading</i> Clindamycin	300mg - 450mg four times daily	
		<i>ONLY in facial cellulitis use Co-amoxiclav.</i>	625mg three times daily	
Leg ulcers (Ref: www.cks.nhs.uk)	Bacteria will always be present. Antibiotics do not improve healing. Culture swabs and antibiotics are only indicated if there is evidence of clinical infection such as inflammation/redness/cellulitis; increased pain; purulent exudate; rapid deterioration of ulcer or pyrexia. Sampling for culture requires cleaning then vigorous curettage and aspiration. All foot 'ulcers' in patients with known or suspected diabetes should be referred as inpatient or outpatient. Where antibiotics are indicated, treat as per cellulitis guidance above. Review antibiotics after culture results. Refer for specialist opinion if severe infection.			
Animal bite (Ref: www.cks.nhs.uk)	Surgical toilet most important. Assess tetanus and rabies risk. Give prophylaxis if cat bite / puncture wound; bite to hand, foot, face, joint, tendon, ligament; immunocompromised / diabetic / asplenic / cirrhotic.	<i>First line animal & human prophylaxis and treatment</i> Co-amoxiclav	375mg - 625mg three times daily	7 days
		<i>If allergic to penicillin</i> Metronidazole PLUS Doxycycline OR Clarithromycin (human) and review at 24 & 48 hrs	200mg - 400mg three times daily 100mg twice daily 500mg twice daily	7 days 7 days 7 days
Human bite	Antibiotic prophylaxis advised. Assess HIV/hepatitis B & C risk			

Illness	Comments	Drug	Dose	Duration of Treatment
Conjunctivitis (Ref: www.cks.nhs.uk)	Most bacterial infections are self-limiting (64% resolve on placebo). They are usually unilateral with yellow-white mucopurulent discharge.	<i>If severe</i> chloramphenicol 0.5% drop and 1% ointment Second line fusidic acid 1% gel	Drops: One drop every 2 hours for the first 48 hours and then reduce one drop to four times daily. Ointment: Apply at night. Twice daily	Until 48 hours after resolution
Scabies (Ref: www.cks.nhs.uk)	Treat all home & sexual contacts within 24hours. Treat whole body from ear / chin downwards and under nails. If under 2yrs or elderly, also face / scalp. Refer also to Scabies guidelines.	Permethrin	5% cream. Apply over whole body and wash off after 12hrs, or leave overnight.	2 applications one week apart
Fungal infection of the fingernail or toenail. For children seek advice	Take nail clippings: Start therapy only if infection is confirmed by laboratory. Idiosyncratic liver reactions occur rarely with Terbinafine. It is more effective than the azoles such as itraconazole. If candida or non-dermatophyte infection confirmed, use oral itraconazole.	Superficial infection 5% amorolfine nail lacquer	1-2 times weekly fingers toes	6 months 12 months
		Terbinafine	250mg once daily fingers toes	6 - 12 weeks 3 - 6 months
		Second line Itraconazole	200mg twice daily fingers toes	7 days each month for 2 months 7 days each month for 3 months
Fungal infection of the skin (Ref: www.cks.nhs.uk)	Terbinafine is fungicidal, so treatment time shorter than with fungistatic imidazoles. If candida possible, use imidazole. If intractable: send skin scrapings. If infection confirmed, use oral terbinafine/itraconazole. Scalp: discuss with specialist.	Topical 1% terbinafine or topical imidazole <i>or (athlete's foot only):</i> topical undecanoates (e.g. <i>Mycota</i> [®]).	Twice daily Twice daily Twice daily	1-2 week for 1-2 weeks after healing (i.e. 4-6wks)

Illness	Comments	Drug	Dose	Duration of Tx
Varicella Zoster/ Chicken pox (Ref: www.cks.nhs.uk) Herpes Zoster/ Shingles (Ref: www.cks.nhs.uk)	<p>If pregnant /breastfeeding / neonate / immunocompromised seek urgent advice re treatment and prophylaxis.</p> <p>Chicken pox: Clinical value of antivirals minimal unless they are an adult, or severe pain, or on steroids, or secondary household case dense /oral rash or smoker AND treatment started <24 hours of onset of rash.</p> <p>Shingles: Start an oral antiviral drug within 72 hours of rash onset for anyone over the age of 50 years with shingles, and people of any age with any of the following criteria:</p> <ul style="list-style-type: none"> ● Ophthalmic involvement (<i>seek immediate specialist advice, or refer immediately</i>). ● Immunocompromised (<i>seek immediate specialist advice regarding treatment, or refer immediately</i>). ● Non-truncal involvement (<i>e.g. shingles affecting the neck, limbs, or perineum</i>). ● Moderate or severe pain. ● Moderate or severe rash. ● Ramsey Hunt or eczema <p>If it is not possible to initiate treatment within 72 hours, consider starting an antiviral drug up to 1 week after rash onset, especially if the person is at higher risk of severe shingles or complications (<i>e.g. continued vesicle formation, older age, or severe pain or immunocompromised</i>).</p> <p>For pregnant women, seek specialist advice regarding prescribing antiviral treatment in pregnancy. For immunocompetent children with shingles, antiviral treatment is not recommended.</p>	First line Aciclovir	800mg five times a day <i>Child doses (<12yrs) see BNF for Children (www.bnf.nhs.uk)</i>	7 days
		Second line for shingles only <i>If compliance a problem (as fifteen times the cost)</i> Famciclovir <i>(only licensed for treatment of Herpes Zoster (Shingles) in adults)</i>	750mg once daily for 7 days <i>(in immunocompromised and only following specialist advice, 500mg three times daily for 10 days)</i>	

Dose are for oral administration to adults, unless otherwise stated. Please refer to the BNF for further information. In pregnancy, and where the benefit of treatment still outweighs the risk, use Erythromycin instead of Clarithromycin.

Reviewed & Updated September 2011 Review September 2014 (*or earlier depending on evidence/HPA updates*)

Authors: HPA Antimicrobial Guidelines for Primary Care 2010. Amended for local use by Dr White, Consultant Microbiologist, ELHT & Richard Lee, Senior Commissioning Pharmacist. Available online at www.elmmb.nhs.uk.

Antibiotic Allergies

The PCT views drug allergy as a serious patient safety issue

For all patients reporting an adverse reaction to an antibiotic (*or any drug*), the nature of this should be clearly documented in the patients health records.

Patients commonly report adverse reactions to antibiotics, especially the penicillin group. It is therefore very important to clarify the nature of the adverse reaction.

Patients often report to being “*allergic*” to an antibiotic, when in fact they experienced a common adverse drug reaction (*e.g. diarrhoea or vomiting*) rather than an *allergic reaction* (*e.g. rash, angioedema or anaphylaxis*). In these cases the benefits of using a penicillin-based regimen probably outweigh the risks.

Crossover allergy

Patients with a true allergy to penicillins should be thought to be allergic to all penicillins. There may also be a crossover allergy to other beta-lactam antibiotics (*e.g. cefalexin*)

The risk of crossover allergy is reported as 10% for cephalosporins, though review of published evidence suggests a much lower chance of crossover allergy.

It is important to document whether cephalosporins have been given without adverse effects in “*penicillin –allergic*” patients for future reference.

Penicillin and beta-lactam antibiotics

Prescribers commonly forget that the following are penicillin antibiotics, and as a consequence they are sometimes prescribed inappropriately in patients with a penicillin allergy:

- **Augmentin®** (*Co-amoxiclav*) contains amoxicillin and clavulanic acid.
- **Magnapen®** (*Co-fluampicil*) contains amoxicillin and flucloxacillin.

Note: This preparation is not recommended for use locally.

Updated and available online at www.elmmb.nhs.uk

NHS Blackburn with Darwen CTP
NHS East Lancashire



Antimicrobial Guidelines for Primary Care February 2012 Version 3.0