



North East and Cumbria antimicrobial prescribing guideline for primary care

This guideline aims to provide primary care clinicians with clear advice on the empirical antibiotic treatment of common infections, to promote the judicious use of antibiotics and to minimise the emergence of bacterial resistance.

This guideline has been produced by the NECS Medicines Optimisation Team on behalf of CCGs in the North East and Cumbria. Treatment guidelines contained in this guide have been adapted from the Public Health England (formerly HPA) Management of Infection for Primary Care guidelines.

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Foreword

This guideline is intended to provide advice on the effective and safe treatment of common infections presenting in primary care in the North East and Cumbria. It is largely based on the [Public Health England \(formerly HPA\) Management of Infection Guidance for Primary Care](#) and NICE Guidance. Clinicians are advised to use professional judgement and involve patients in management decisions.

The guideline should not be used in isolation, it should be supported with patient information about back-up/delayed antibiotics, infection severity and usual duration, clinical staff education, and audits. Materials are available on the RCGP TARGET website.

Further information, evidence and references are available through the [Public Health England website](#) and [NICE Clinical Knowledge Summaries](#).

Doses unless stated otherwise are for adults, adjust for age, size and metabolic function. Refer to [current BNF](#) and [BNF for children](#) for further information.

Background

Antimicrobial stewardship and appropriate use of antibiotics is a global issue, and conserving the use of currently available antibiotics is a vital part of antimicrobial stewardship. The UK five year antimicrobial resistance strategy, published by the Department of Health in September 2013, highlighted the indiscriminate or inappropriate use of antibiotics as a key driver in the spread of antimicrobial resistance. Optimising prescribing practices is a key component of the strategy which highlights the need for sector specific prescribing guidelines to promote responsible use of antibiotics.

MicroGuide app

This guideline is also available to download free of charge as an app for your smartphone/ tablet. To get the app search for MicroGuide in the Apple Store or Google Play on your smart device. Select North of England CCGs from the list of medical organisations and you will be ready to download the guideline. The app will automatically update when the guideline is reviewed.

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10 steps for good antimicrobial prescribing practice

1. Prescribe an antibiotic only when there is likely to be a clear clinical benefit
2. Document clinical indication, duration, dose and route in patient records
3. Do not prescribe an antibiotic for viral sore throat, simple coughs and colds
4. Consider a no, or delayed, antibiotic strategy for acute self-limiting upper respiratory tract infections
5. Limit prescribing over the telephone to exceptional cases
6. Use simple generic antibiotics first whenever possible
7. Avoid broad spectrum antibiotics where a narrow spectrum agent will be effective
8. Avoid widespread use of topical antibiotics (especially those agents also available as systemic preparations)
9. In pregnancy take specimens to inform treatment; AVOID tetracyclines, aminoglycosides, quinolones, azithromycin, clarithromycin and high dose metronidazole. Short term use of trimethoprim (theoretical risk in first trimester in patients with poor diet, as folate antagonist) or nitrofurantoin (at term, theoretical risk of neonatal haemolysis) is unlikely to cause problems to the foetus
10. Where a 'best guess' therapy has failed or special circumstances exist, advice can be obtained from your local microbiologist

Microbiology contacts

Main switchboard numbers are listed below. Please ask for the Duty Microbiologist.

City Hospitals Sunderland NHS Foundation Trust
0191 565 6256

County Durham and Darlington NHS Foundation Trust
0191 333 2333

Gateshead Health NHS Foundation Trust
0191 482 0000

Newcastle upon Tyne Hospitals NHS Foundation Trust
0191 233 6161

North Cumbria University Hospitals NHS Trust
01228 523444

North Tees and Hartlepool NHS Foundation Trust
01642 617617

Northumbria Healthcare NHS Foundation Trust
0344 811 8111

South Tees Hospitals NHS Foundation Trust
01642 850850

South Tyneside NHS Foundation Trust
0191 404 1000

University Hospitals of Morecambe Bay NHS Foundation Trust
01229 870870

Risk of sepsis

Sepsis is a medical emergency, it is responsible for 37,000 deaths annually in the UK and severe sepsis has a five-fold higher mortality than STEMI or stroke. A high degree of vigilance is required for early identification of the septic patient. In the primary care setting, where perceived infection is one of the most common reasons for presentation, clinical acumen of the GP is essential in determining which patients to evaluate for sepsis.

As well as the general impression at the time of initial assessment, **the presence of abnormal observations should be enough to initiate evaluation for sepsis.**

In severe infection it is important to initiate antibiotics as soon as possible.

Further information on sepsis, including GP sepsis screening and action tool can be found on page 23.

Risk of *Clostridium difficile* infection

Antibiotic exposure is associated with a significantly higher risk of *Clostridium difficile* infection (CDI) than no antibiotic exposure.

Ciprofloxacin, **c**ephalosporins, **cl**indamycin and **co**-amoxiclav (the 4C antibiotics) and other broad spectrum antimicrobials are associated with an increased risk of CDI.

Antibiotics associated with an increased risk of CDI have been highlighted with the use of red text and ☹ throughout this guide.

When using antibiotics associated with an increased risk of CDI counsel patients at risk to be alert for signs of CDI and seek medical help if diarrhoea develops.

Further information on CDI can be found on page 24.

Penicillin allergy

Allergy is one of the most common and important adverse effects of penicillin and related drugs.

All cases of penicillin allergy should be recorded in the patient's notes.

Anaphylaxis is rare, but can be fatal. Any patient describing anaphylaxis following penicillin exposure must not be prescribed any penicillin again.

Further information on penicillin allergy can be found on page 25.

Quick reference guide to common infections in primary care

Please refer to the [North East and Cumbria antimicrobial prescribing guideline for primary care](#) for full details.
NB. Clarithromycin should be avoided in pregnancy (Erythromycin 500mg would be a suitable alternative)

Upper respiratory tract infections

Antibiotics are rarely necessary as most upper respiratory tract infections are self-limiting. Provide patients with advice about total illness length and advice regarding management of symptoms, particularly analgesics and antipyretics.

Acute sore throat – avoid antibiotics, 90% resolve in 7 days without and pain only reduced by 16 hours. Assess severity using [FeverPAIN](#) clinical scoring system.

- First line: **Phenoxymethylpenicillin 500mg QDS for 10 days**
- Penicillin allergy: **Clarithromycin 250-500mg BD for 5 days** – avoid in pregnancy

Acute rhinosinusitis – avoid antibiotics, 80% resolve in 14 days without, and they only offer marginal benefit after 7 days

- First line: **Amoxicillin 500mg TDS for 7 days** or
- Penicillin allergy: **Doxycycline 200mg stat then 100mg OD for 7 days**

Acute otitis media in children – avoid antibiotics as 60% are better within 24 hours

- First line: **Amoxicillin** (see [BNF for Children \(BNF-C\)](#) for doses)
- Penicillin allergy: **Erythromycin** (children <12), **Clarithromycin** (children ≥12) for 5 days (see [BNF-C](#) for doses)

Lower respiratory tract infections

Acute cough, bronchitis – antibiotics of little benefit if no co-morbidity. Consider delayed antibiotic with advice. Consider immediate antibiotics if >80years **and** one of: hospitalisation in the past year, oral steroids, diabetic, congestive heart failure **OR** >65 years with two of the above.

- First line: **Amoxicillin 500mg TDS for 5 days**
- Penicillin allergy: **Doxycycline 200mg stat then 100mg OD for 5 days**

Acute exacerbation of COPD – treat promptly with antibiotics if purulent sputum and increased shortness of breath and/or increased sputum volume.

- **Doxycycline 200mg stat then 100mg OD for 5 days** or **Amoxicillin 500mg TDS for 5 days**
- Alternative (if resistance risk factors) **Co-amoxiclav 625mg TDS for 5 days**

Urinary tract infections

UTI in adults (lower)

- All patients first line antibiotic: **Nitrofurantoin 50mg QDS or 100mg BD (modified release) for 3 days in women/ 7 days in men** *nitrofurantoin is contra-indicated in patients with eGFR<45ml/min. If no alternative treatment is available short courses may be used with caution in patients with eGFR 30-44ml/min.*
- Alternative treatments if Nitrofurantoin contraindicated:
 - If low risk of resistance **Trimethoprim 200mg BD for 3 days in women/ 7 days in men**
 - If high risk of resistance or GFR <45ml/min **Pivmecillinam 400mg stat, then 200mg TDS for 3 days in women/ 7 days in men**

Skin infections

Cellulitis and wound infection

- First line: **Flucloxacillin 500mg-1g QDS for 7 days***
- Alternative (penicillin allergy): **Clarithromycin 500mg BD for 7 days** – avoid in pregnancy
** continue treatment for a further 7 days if slow response -*

Impetigo (also boils, carbuncles, folliculitis, staphylococcal paronychia and staphylococcal whitlow)

- First line: **Flucloxacillin 500mg – 1g QDS for 7 days** (see [BNF-C](#) for patients <18 years of age)
- Penicillin allergy: **Clarithromycin 500mg BD for 7 days** – avoid in pregnancy
- If liquid formulation required: **Erythromycin** (see [BNF-C](#) for doses)

Bites (human and animal)

- First line: **Co-amoxiclav 625mg TDS for 7 days**
- Penicillin allergy: **Metronidazole 400mg TDS for 7 days** **PLUS doxycycline 100mg BD for 7 days**

Upper respiratory tract infections

Most respiratory tract infections are self-limiting, therefore antibiotics are rarely necessary.

Consider a delayed antibiotic prescription strategy. Giving out antibiotics automatically for upper respiratory tract infections increases the number of future consultations for the same symptoms.

The NICE care pathway for respiratory tract infections states that all patients should be offered:

1. Advice about the natural history of the illness and total illness length
2. Advice regarding management of symptoms, particularly analgesics and antipyretics (a patient information leaflet is available through the RCGP TARGET toolkit)

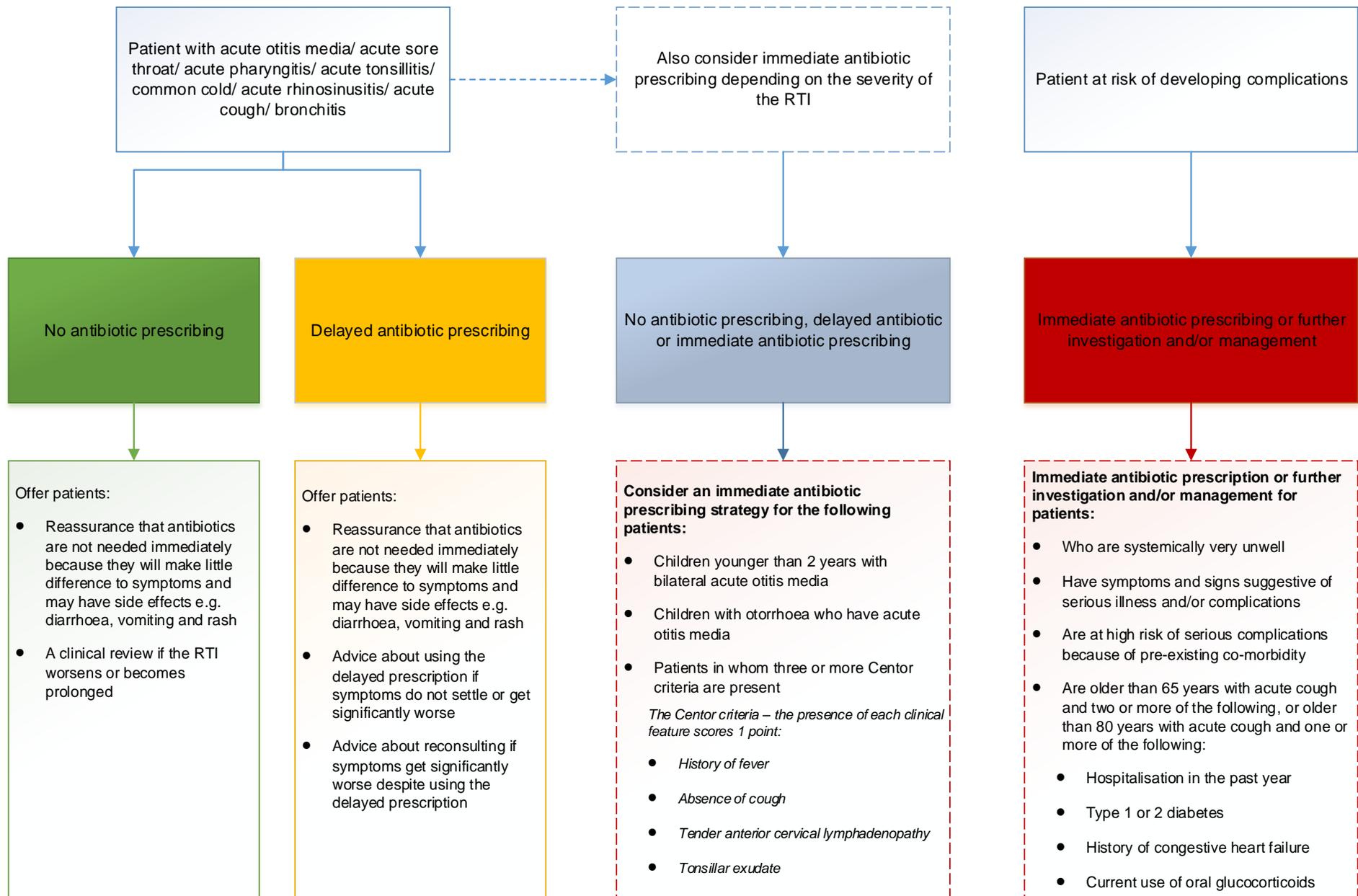
Natural history and average illness length for common respiratory tract infections:

| Infection | Average length of symptoms |
|----------------------|----------------------------|
| Middle-ear infection | 4 days |
| Sore throat | 7 days |
| Common cold | 10 days |
| Sinusitis | 18 days |
| Cough or bronchitis | 21 days |

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
|-----------------------------------|---|--------------------------------------|--|--|
| Acute otitis externa (AOE) | <p>It is important to exclude an underlying chronic otitis media before treatment is commenced.</p> <p>Many cases recover after thorough cleansing of the external ear canal by suction or dry mopping. Cure rates are similar at 7 days for topical acetic acid or antibiotic +/- steroid.</p> <p>If cellulitis or disease extending outside ear canal start oral antibiotics and refer to exclude malignant OE.</p> | | <p>First line: Acetic acid 2% ear spray (Ear-calm®) 1 spray TDS for 7 days and analgesia *For patients who pay for prescriptions Ear-calm® spray is available to purchase from pharmacies for less than a prescription charge.</p> <p>Alternative: Neomycin sulfate with corticosteroid drops (Betnesol N®) 3 drops TDS for a minimum of 7 days; maximum 14 days</p> <p>Or Neomycin sulfate with dexamethasone spray (Otomize®) 1 spray TDS</p> | <p>NICE Clinical Knowledge Summaries: Otitis externa</p> |

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
|---|---|---|---|--|
| Acute otitis media in children (AOM) | <p>Avoid antibiotics as 60% are better within 24 hours without: they only reduce pain at 2 days (NNT = 15) and do not prevent deafness.</p> <p>Consider a delayed antibiotic prescription strategy.</p> <p>Public Health England suggest you consider a 2 or 3 day delayed or immediate antibiotics for pain relief if:</p> <ul style="list-style-type: none"> • <2 years with bilateral AOM (NNT = 4) • All ages with otorrhoea (NNT = 3) | <p>Use NSAIDs or paracetamol for pain relief.</p> <p>Inform the parent/ carer that the total duration of illness for untreated acute otitis media, before and after seeing a healthcare professional is 4 days.</p> <p>Advise the person to re-consult if the condition worsens or if symptoms are not starting to settle within 3 days of the onset of the illness.</p> | <p>First line: Amoxicillin see latest BNF for children for accurate doses.</p> <p>Alternative (penicillin allergy): Erythromycin* for children <12 years see latest BNF for children for accurate doses. Clarithromycin for children ≥12 years 250 – 500mg BD for 5 days *macrolides concentrate intracellularly and so are less active against the extracellular <i>H. influenza</i></p> | <p>NICE Clinical Knowledge Summaries: Otitis media NICE CG47: Feverish illness in children NICE CG69: Respiratory tract infections</p> |
| Acute rhinosinusitis | <p>Avoid antibiotics as 80% resolve in 14 days without, and they only offer marginal benefit after 7 days (NNT = 15).</p> <p>Consider a delayed antibiotic prescription strategy.</p> <p>Consider 7-day delayed or immediate antibiotic when fever >38°C, toothache.</p> | <p>Use adequate analgesia.</p> | <p>First line: Amoxicillin 500mg TDS for 7 days</p> <p>Or Phenoxymethylpenicillin 500mg QDS for 7 days</p> <p>Alternative (penicillin allergy): Doxycycline 200mg stat then 100mg OD for 7 days</p> <p>Persistent symptoms: Co-amoxiclav Ⓢ 625mg TDS for 7 days</p> | <p>NICE Clinical Knowledge Summaries: Sinusitis NICE CG69: Respiratory tract infections</p> |
| Acute sore throat | <p>The majority of sore throats are viral; most patients do not benefit from antibiotics. 90% of cases resolve in 7 days without antibiotics, and pain only reduced by 16 hours. Adequate analgesia and fluids will usually be all that is required.</p> <p>Consider a delayed antibiotic prescription strategy.</p> <p>Clinical scoring systems can be used to help decide whether to prescribe an antibiotic. Public Health England recommend using the FeverPAIN score as an alternative to the Centor criteria.</p> <p>Always share self-care advice and safety net.</p> | <p>FeverPAIN score: each clinical feature scores 1 point:</p> <ul style="list-style-type: none"> • Fever in last 24 hours • Purulence • Attend rapidly under 3 days • Inflamed tonsils • No cough or coryza <p>Score 0-1 = 13-18% streptococci, use NO antibiotic strategy Score 2-3 = 34-40% streptococci, use 3 day back-up antibiotic Score >4 = 62-65% streptococci, use immediate antibiotic if severe, or 48 hour short back-up prescription</p> <p>The Centor criteria: the presence of each clinical feature scores 1 point:</p> <ul style="list-style-type: none"> • History of fever • Absence of cough • Tender anterior cervical lymphadenopathy • Tonsillar exudate <p>Score 0-2 indicates a low chance of <i>Group A Beta-haemolytic Streptococci</i> (GABHS) Score 3-4 or history of OM, consider a 2 or 3 day delayed antibiotic prescription strategy or immediate antibiotics</p> | <p>First line: Phenoxymethylpenicillin 500mg QDS for 10 days.</p> <p>Alternative (penicillin allergy): Clarithromycin 250 – 500mg BD for 5 days</p> <p>Pregnant and penicillin allergy: Erythromycin 500mg QDS for 5 days</p> | <p>NICE Clinical Knowledge Summaries: Acute sore throat NICE CG 69: Respiratory tract infections – antibiotic prescribing</p> <p>FeverPAIN clinical score</p> |

Key points from the NICE care pathway for respiratory tract infections



Adapted from the [NICE pathway for self-limiting respiratory tract infections – antibiotic prescribing overview](#).

Lower respiratory tract infections

Low doses of penicillins are more likely to select out resistance.

Do **not** use ciprofloxacin first line. Reserve **all** quinolones for proven resistant organisms.

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
|-----------------------------------|---|---|---|--|
| Acute cough, bronchitis | <p>Consider 7 days delayed antibiotic with symptomatic advice/ patient information leaflet.</p> <p>Care should be taken to exclude a differential diagnosis of pneumonia. Antibiotics are not indicated in people who are otherwise well. Routine follow up is not necessary, however patients should be advised to seek advice if their condition deteriorates significantly or symptoms persist for longer than 3 weeks.</p> <p>Consider immediate antibiotics if >80 years of age and with one of the following:</p> <ul style="list-style-type: none"> • Hospitalization in past year • Oral steroids • Diabetic • Congestive heart failure <p>OR >65 years of age and two of the above.</p> <p>Consider CRP test if antibiotic being considered</p> <ul style="list-style-type: none"> • CRP <20mg/L consider no antibiotics • CRP 20-100mg/L consider delayed antibiotic strategy • CRP >100mg/L consider immediate antibiotic prescription | <p>Use paracetamol or ibuprofen as required, drink plenty of fluids. Symptom resolution can take up to 3 weeks.</p> | <p>Amoxicillin 500mg TDS for 5 days. Or Doxycycline 200mg stat, then 100mg OD for 5 days</p> | <p>NICE Clinical Knowledge Summaries: Chest infections</p> <p>NICE CG69: Respiratory tract infections</p> |
| Acute exacerbation of COPD | <p>Treat exacerbations promptly with antibiotics if purulent sputum and increased shortness of breath and/or increased sputum volume</p> <p>Risk factors for antibiotic resistant organisms include co-morbid disease, severe COPD, frequent exacerbations, antibiotics in last 3 months.</p> | <p>! Increased risk of C.diff infection with co-amoxiclav.</p> | <p>First line: Doxycycline 200mg stat, then 100mg OD for 5 days Or Amoxicillin 500mg TDS for 5 days</p> <p>Alternative (if resistance risk factors): Co-amoxiclav ® 625mg TDS for 5 days</p> | <p>NICE Clinical Knowledge Summaries: Chest infections</p> <p>NICE CG69: Respiratory tract infections – antibiotic prescribing</p> |

| | When to treat | Prescribing notes and general advice | When treatment is needed | | References and further information |
|--|---|---|---|---|---|
| Community acquired pneumonia (treatment in the community) | <p>Do not routinely offer microbiological tests to patients with low-severity community acquired pneumonia.</p> <p>Use CRB-65 score to help guide and review:</p> <ul style="list-style-type: none"> Consider home-based care for patients with a CRB-65 score of 0 Consider hospital assessment for all other patients, particularly those with a CRB-65 score of 2 or more <p>For patients with moderate or high-severity community acquired pneumonia:</p> <ul style="list-style-type: none"> Take blood and sputum cultures and Consider pneumococcal and legionella urinary antigen tests <p>Do not routinely offer a glucocorticoid to patients with community acquired pneumonia unless they have other conditions for which glucocorticoid treatment is indicated.</p> | <p>CRB-65 score for mortality risk assessment in primary care:</p> <p>Each scores 1:</p> <ul style="list-style-type: none"> Confusion (AMT <8) Raised respiratory rate (≥ 30 breaths per minute) Low blood pressure (systolic ≤ 90mmHg or diastolic ≤ 60mmHg) Age ≥ 65 years <p>Patients are stratified for risk of death as follows:</p> <ul style="list-style-type: none"> 0: low risk (<1% mortality risk) 1 or 2: intermediate risk (1-10% mortality risk) 3 or 4: high risk (more than 10% mortality risk) | <p>If CRB-65=0</p> <p>First line: Amoxicillin 500mg TDS for 5 days*</p> <p>Alternative (penicillin allergy): Clarithromycin 500mg BD for 5 days* - avoid in pregnancy</p> <p>Or: Doxycycline 200mg stat, then 100mg OD for 5 days*</p> <p>*consider extending the course of the antibiotic for longer than 5 days as a possible management strategy for patients with low-severity community acquired pneumonia whose symptoms do not improve as expected after 3 days.</p> <p>Explain to patients/carers they should seek further medical advice if their symptoms do not begin to improve within 3 days of starting the antibiotic, or earlier if their symptoms are worsening.</p> | <p>If CRB-65=1 and able to be managed at home</p> <p>First line: Amoxicillin 500mg TDS for 7-10 days</p> <p>PLUS Clarithromycin 500mg BD for 7-10 days – avoid in pregnancy</p> <p>Or: Doxycycline 200mg stat, then 100mg OD for 7-10 days</p> | <p>NICE Clinical Knowledge Summaries: Chest infections - adult</p> <p>BTS Guidelines for the Management of Community Acquired Pneumonia</p> <p>NICE CG191: Pneumonia: Diagnosis and management of pneumonia in adults</p> |

Urinary tract infections

Antimicrobial resistance and community multi-resistant **extended-spectrum beta-lactamase *E.coli*** is increasing. Always provide safety net and self-care advice and consider risks for resistance.

Do not routinely dipstick to exclude UTI. In elderly patients (>65 years), diagnosis should be based on full clinical assessment, including vital signs. Dipstick tests are only indicated for women <65 years who have minimal signs and symptoms. Please refer to [SIGN guidance 88](#) for guidance on dipstick testing in the community.

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
|------------------------------|--|---|--|---|
| UTI in adults (lower) | <p>Do not treat asymptomatic bacteriuria; it is common but it is not associated with increased morbidity.</p> <p>Treat women with severe/ or ≥ 3 symptoms.</p> <p>Women (mild/ ≤ 2 symptoms): pain relief and consider back-up/ delayed antibiotic.</p> <p>If urine not cloudy, UTI unlikely (97% NPV of no UTI)</p> <p>If urine cloudy, use dipstick to guide treatment (see PHE urinary tract infection diagnosis guide for primary care for more information): Nitrite, leucocytes, blood all negative UTI unlikely (76% NPV); nitrite plus blood or leucocytes UTI likely (92% PPV or UTI.)</p> <p>Men: consider prostatitis and send MSU or if symptoms mild/ non-specific, use negative dipstick to exclude UTI.</p> <p>>65 years: treat if fever $\geq 38^\circ\text{C}$ or 1.5°C above base twice in 12 hours and dysuria or ≥ 2 other symptoms.</p> <p>If treatment failure: always perform culture.</p> | <p>Low risk of resistance: younger women with acute UTI and no resistance risks.</p> <p>Risk factors for increased resistance include:</p> <ul style="list-style-type: none"> Care home resident Recurrent UTI (2 in 6 months; ≥ 3 in 12 months) Hospitalization for >7 days in last 6 months Unresolving urinary symptoms Recent travel to a country with increased resistance Previous UTI resistant to trimethoprim, cephalosporins or quinolones <p>If risk of resistance: send urine for culture and susceptibilities and always safety net.</p> <p>Use the TARGET UTI patient leaflet in consultations with women with non-complicated UTIs. This is a useful tool for consultations where the clinician feels that the patient does not require an antibiotic prescription.</p> | <p>All patients first line antibiotic: Nitrofurantoin <i>50mg QDS or 100mg BD (modified release) for 3 days in women/ 7 days in men*</i></p> <p>*nitrofurantoin is contra-indicated in patients with $\text{eGFR} < 45\text{ml/min}$. If no alternative treatment is available short courses of nitrofurantoin may be used with caution in patients with $\text{eGFR} 30\text{--}44\text{ml/min}$. For further information see MHRA Drug Safety Update September 2014.</p> <p>Alternative treatments if Nitrofurantoin contraindicated:</p> <p>If low risk of resistance: Trimethoprim 200mg BD for 3 days in women/ 7 days in men</p> <p>If high risk of resistance or $\text{GFR} < 45\text{ml/min}$: Pivmecillinam 400mg stat, then 200mg TDS for 3 days in women/ 7 days in men</p> <p>If first line options unsuitable:</p> <p>If high risk of resistance, poor renal function and penicillin allergic: Fosfomycin 3g stat in women; in men follow up with second 3g dose 3 days later (unlicensed)</p> <p>If organism susceptible: Amoxicillin 500mg TDS for 3 days in women/ 7 days in men</p> <p>(NB. If sensitivities known then use lowest-risk options; nitrofurantoin, trimethoprim, or amoxicillin etc in preference to cefalexin or ciprofloxacin)</p> | <p>PHE Urinary tract infection: diagnosis guide for primary care</p> <p>SIGN: Management of suspected bacterial urinary tract infection in adults</p> <p>NICE CKS: Urinary tract infection (lower) – women</p> <p>NICE CKS: Urinary tract infection(lower) – men</p> <p>RCGP UTI clinical module</p> <p>SAPG: Alternative management of lower UTI</p> |

| | When to treat | Prescribing notes and general advice | When treatment is needed | | References and further information |
|--|---|--|--|--|--|
| Acute pyelonephritis | <p>Whether or not a person with acute pyelonephritis should be admitted to hospital depends on a number of factors including the severity of their symptoms, their general state of health, comorbidities and age.</p> <p>If admission is not needed, send MSU for culture and sensitivities and start antibiotics.</p> <p>If no response within 24 hours, admit.</p> | <p>! Increased risk of <i>C.diff</i> infection with ciprofloxacin and co-amoxiclav.</p> <p>Encourage adequate fluid intake.</p> | <p>Co-amoxiclav Ⓢ 625mg TDS for 7 days</p> <p>Or Ciprofloxacin Ⓢ 500mg BD for 7 days* *may not be as effective in patients with renal impairment.</p> <p>If lab report shows sensitive: Trimethoprim 200mg BD for 14 days</p> | | <p>NICE Clinical Knowledge Summaries: Pyelonephritis – acute</p> |
| Acute prostatitis | <p>Send MSU for culture and start antibiotics. 4 week course may prevent chronic prostatitis. Quinolones achieve higher prostate levels.</p> | | <p>Ciprofloxacin 500mg BD for 28 days</p> <p>or Ofloxacin 200mg BD for 28 days</p> <p>Second line: Trimethoprim 200mg BD for 28 days</p> | | |
| Recurrent UTI in non-pregnant women (2 in 6 months or ≥3 UTIs per year) | <p>To reduce risk of recurrence advise simple measures, including hydration and analgesia. Cranberry products work for some women, but good evidence is lacking.</p> | | <p>Please refer to local treatment protocols for recurrent UTI. Where treatment is indicated or awaiting referral to specialist:</p> <p>If antibiotics are indicated: Nitrofurantoin 100mg at night OR post-coital stat (off-label) for 3-6 month; then review recurrence rate and need</p> <p>Second line in poor renal function: Pivmecillinam 200mg at night OR post-coital stat (off-label) for 3-6 month</p> <p>Third line: seek advice from local microbiologist</p> | | <p>Scottish Medicines Consortium Guidance SIGN Guideline 88</p> |
| UTI in children | <p>Assess the risk of serious illness in line with NICE CG47 (Feverish illness in children).</p> <p>Infants <3 months: urgently refer all infants less than 3 months of age if UTI is suspected.</p> <p>Treat mildly unwell children aged 3 months and older. Use positive nitrite to guide. Send pre-treatment MSU for all.</p> <p>Imaging: only refer if child younger than 6 months of age or recurrent or atypical UTI.</p> | <p>Most children are well 24-48 hours after starting treatment. If the infant or child is still unwell after 24-48 hours they should return for reassessment.</p> <p>Encourage adequate fluid intake (for example check that the child is passing adequate amounts of urine or is having wet nappies).</p> | <p>Lower UTI</p> <p>Trimethoprim for 3 days*</p> <p>Or Nitrofurantoin for 3 days*</p> <p>Or Amoxicillin (if susceptible) for 3 days*</p> <p>Or Cefalexin for 3 days* *see BNF for children for accurate dosing information</p> <p>(Cefalexin preferred in Sunderland due to local resistance patterns)</p> | <p>Upper UTI</p> <p>Co-amoxiclav Ⓢ for 7-10 days (see BNF for children for accurate doses)</p> | <p>NICE Clinical Knowledge Summaries: Urinary tract infection – children NICE CG54: Urinary tract infections in children</p> |

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
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| UTI in patients with catheters | Antibiotics will not eradicate asymptomatic bacteriuria. Only treat if systemically unwell or pyelonephritis likely, do not use prophylaxis for catheter change unless history of catheter change associated UTI or trauma. Take sample if new onset of delirium, or two or more symptoms of UTI. | <p>Do not use dipstick testing to diagnose UTI in patients with catheters.</p> <p>A catheter specimen of urine sample is necessary in suspected catheter related UTI but CSU samples should not be sent in the absence of clinical evidence of a UTI.</p> | Therapy is not indicated for asymptomatic patients. | SIGN guidance: Management of suspected bacterial UTI in adults |
| UTI in pregnancy | <p>Symptomatic bacteriuria occurs in 17-20% of pregnancies. Pregnant women with mild to moderate symptomatic UTI should be treated with an antibiotic.</p> <p>Send MSU for culture and sensitivity stating clearly which trimester and start empirical antibiotics.</p> | <p>Short term use of nitrofurantoin in pregnancy is unlikely to cause problems to the foetus. The BNF recommends that nitrofurantoin should be avoided at term, because of the risk of neonatal haemolysis.</p> <p>Avoid trimethoprim if low folate status or on folate antagonist (e.g. antiepileptics)</p> | <p>First line: Nitrofurantoin* 100mg BD (modified release) or 50mg QDS (standard release) for 7 days * *contra-indicated in patients with eGFR<45ml/min</p> <p>Or Amoxicillin (if susceptible) 500mg TDS for 7 days</p> <p>Alternative: Trimethoprim 200mg BD for 7 days (unlicensed) Also give folic acid 5mg daily if 1st trimester Or Cefalexin 500mg BD for 7 days</p> | NICE Clinical Knowledge Summaries: Urinary tract infection (lower) – women |

Gastrointestinal tract infections

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
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| Acute diverticulitis | Information on the management of acute diverticulitis can be found on the NICE Clinical Knowledge Summaries website . | | | NICE Clinical Knowledge Summaries: Acute diverticulitis |
| Clostridium difficile infection | <p>ALL positive cases of C.diff infection should be discussed with a microbiologist prior to initiating treatment.</p> <p>Non-severe CDI: treat in primary care.</p> <ul style="list-style-type: none"> Mild CDI: not associated with a raised WCC, typically associated with <3 stools of type 5-7 on the Bristol Stool Chart per day. Moderate CDI: associated with a raised WCC (<15x10⁹/L), typically associated with 3-5 stools per day. <p>Severe CDI: specialist treatment only. Admit as an emergency.</p> <ul style="list-style-type: none"> Severe CDI: associated with WCC >15x10⁹/L or an acute rising serum creatinine (i.e. 50% above baseline), or evidence of severe colitis. Life-threatening CDI: includes hypotension, partial or complete ileus of toxic megacolon, or CT evidence of severe disease. | <p>How to respond to positive lab results:</p> <ol style="list-style-type: none"> Initiate treatment as indicated (and isolate the patient if in a nursing/ care home) Stop concomitant (non <i>C.difficile</i>) antibiotics if safe to do so and any laxatives Review and stop any concomitant PPI use if possible Do not use antimotility drugs e.g. loperamide | <p>Treat according to local microbiological advice.</p> <p>Where metronidazole is recommended: 400mg TDS for 10-14 days (70% of patients respond to metronidazole in 5 days; 92% in 7 days)</p> <p>Where vancomycin is recommended: Please note vancomycin caps 125mg QDS cannot be administered via PEG.</p> | NICE Clinical Knowledge Summaries: Diarrhoea – antibiotic associated |
| Detection and eradication of H.pylori | <p>The presence of <i>H.pylori</i> should be confirmed before starting eradication therapy. One week triple treatment eradicates <i>H.pylori</i> in >90% of cases.</p> <p>There is no need to continue PPI beyond eradication treatment unless ulcer is complicated by haemorrhage or perforation.</p> <p>Do not use clarithromycin, metronidazole or quinolone if used in past year for any infection.</p> <p>Avoid clarithromycin in pregnancy</p> <p>Retest for H. pylori post DU/GU or relapse after second line therapy: using breath or stool test OR consider endoscopy for culture and susceptibility.</p> | <p><i>H.pylori</i> can be initially detected using a stool antigen test or urea breath test. Where re-testing is necessary a breath test should be used.</p> <p>Testing for <i>H.pylori</i> should not be performed within 4 weeks of treatment with any antibiotic or 2 weeks with any PPI.</p> | <p>Always use PPI <i>twice daily</i> (refer to local formulary for first line choice).</p> <p>First line treatment: PPI WITH amoxicillin 1g BD for 7 days PLUS either clarithromycin* 500mg BD for 7 days OR metronidazole* 400mg BD for 7 days *choose the treatment regimen with the lowest acquisition cost, and take into account previous exposure to clarithromycin or metronidazole.</p> <p>Penicillin allergy: PPI WITH clarithromycin 500mg BD for 7 days PLUS metronidazole 400mg BD for 7 days For relapses discuss with specialist prior to initiating treatment</p> | NICE Clinical Knowledge Summaries: Dyspepsia – proven peptic ulcer NICE CG184: Dyspepsia and gastro-oesophageal reflux disease |

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
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| Gastroenteritis | Treatment should only be considered on the advice of a microbiologist in severe or invasive infections (severe systemic upset and/or dysentery). Antibiotic therapy is not usually indicated. Fluid replacement essential. Do not use antimotility drugs if stools are bloody. | | | NICE Clinical Knowledge Summaries: Gastroenteritis |
| Threadworms | Treatment is recommended if threadworms have been seen or eggs detected. All household contacts should be treated simultaneously. | Advise morning shower/ baths and hand hygiene. Wash sleepwear, bed linen, towels, and cuddly toys at normal temperatures and rinse well. Thoroughly vacuum and dust, paying particular attention to the bedrooms, including vacuuming mattresses. | Adults and children >6 months of age: Mebendazole 100mg single dose (a second dose may be needed after 2 weeks) Mebendazole is unlicensed for children under 2 years of age, however it is an accepted treatment in children >6 months and is endorsed by the BNF for children . For patients who pay for prescriptions Mebendazole (suspension and chewable tablets) are available to purchase from pharmacies for less than a prescription charge (for adults and children over 2 years of age). Manufacturer recommends avoiding mebendazole in pregnancy. During pregnancy, physical removal of eggs combined with hygiene methods is the preferred treatment. | NICE Clinical Knowledge Summaries: Threadworm BNF for Children: 5.5.1 Drugs for threadworms |
| Traveller's diarrhoea | For assessment of individual countries see the National Travel Health Network and Centre (NaTHNaC) website (www.nathnac.org). If a prescription is considered necessary for people travelling to remote areas, treatment should be via private prescription. | | | NaTHNaC: Health Professionals – travellers' diarrhoea |

Genital tract infections

STI screening: People with risk factors (<25 years of age, no condom use, recent (<12 months) change of partner, symptomatic partner, high risk sexual practices) should be screened for chlamydia, gonorrhoea, HIV, syphilis. **Refer to GUM clinic or GP with level 2 or 3 expertise in GUM.**

Clinical guidelines from the British Association for Sexual Health and HIV (BASHH) can be found on the [BASHH website](#).

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
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| Acute prostatitis | <p>Start antibiotic treatment immediately, while waiting for MSU culture results.</p> <p>Reassess after 24-28 hours. Review the culture results and ensure that an appropriate antibiotic is being used. Refer to urology urgently if the infection is not responding adequately to treatment.</p> | <p>Provide pain relief with paracetamol and/or ibuprofen (taken regularly) For severe pain, offer codeine with paracetamol.</p> <p>If defecation is painful, offer a stool softener such as docusate or lactulose.</p> | <p>First line: Ciprofloxacin 500mg BD for 28 days (Quinolones achieve higher prostate levels.)</p> <p>Second line: Trimethoprim 200mg BD for 28 days</p> | <p>NICE Clinical Knowledge Summaries: Prostatitis – acute</p> |
| Bacterial vaginosis | <p>Approximately 50% of women with BV are asymptomatic. When symptoms are present, BV is characterized by a fishy-smelling vaginal discharge. Women with asymptomatic bacterial vaginosis (BV) do not usually require treatment.</p> <p>Symptomatic women should be managed as per the treatment choices outlined below.</p> <p>Pregnant women should be managed as per treatment choices below, however the 2g stat dose of metronidazole should not be used.</p> | <p>Clindamycin 2% cream weakens condoms. Women should be advised not to rely on barrier methods during treatment and for 5 days following.</p> <p>Oral metronidazole is as effective as topical treatment but is cheaper. Less relapse at 4 weeks with 7 day course than 2g stat.</p> | <p>First line: Metronidazole PO 400mg BD for 7 days</p> <p>Or Metronidazole PO 2g stat*</p> <p>*2g stat dose of metronidazole should not be used in pregnant women</p> <p>Alternative: Metronidazole vaginal gel 0.75% 5g (1 applicatorful) intravaginally at night for 5 nights</p> <p>Or Clindamycin cream 2% 5g (1 applicatorful) intravaginally at night for 7 nights</p> | <p>NICE Clinical Knowledge Summaries: Bacterial vaginosis – summary</p> |

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
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| Chlamydia trachomatis | <p>Treatment should be initiated promptly in all people who test positive for chlamydia, or have signs or symptoms strongly suggestive of chlamydia (after testing for other sexually transmitted infections as appropriate).</p> <p>Opportunistically screen all aged 15 – 25 years.</p> <p>If acceptable, refer to a GUM clinic who will arrange treatment, screening for other STIs, detailed information on STIs, and partner notification.</p> | <p>Sexual intercourse should be avoided until both the person diagnosed with chlamydia and any partners have completed the course of treatment.</p> <p>(If single dose azithromycin is given, sexual abstinence for the following 7 days is advised or until any sexual partners have completed their treatment, whichever is the longer.)</p> | <p>Doxycycline 100mg BD for 7 days</p> <p>Or Azithromycin 1g stat (taken 1 hour before or 2 hours after food)</p> <p>Pregnancy and breastfeeding: Azithromycin (off-label use) 1g stat</p> <p>Or Erythromycin 500mg QDS for 7 days</p> <p>Or Amoxicillin 500mg TDS for 7 days</p> | <p>NICE Clinical Knowledge Summaries: Chlamydia</p> <p>British Association for Sexual Health & HIV: Chlamydia guideline</p> <p>SIGN: Management of genital chlamydia trachomatis infection</p> |
| Epididymo-orchitis, epididymitis, and orchitis | Information on the management of epididymo-orchitis, epididymitis, and orchitis can be found on the NICE Clinical Knowledge Summaries website | | | <p>NICE Clinical Knowledge Summaries: Scrotal swellings – epididymo-orchitis</p> |
| Genital herpes | <p>Refer to Sexual Health Service for confirmation of diagnosis or (if first episode) send viral swab to lab.</p> <p>Consider the need for full STI screening in all cases.</p> <p>Commence treatment within 5 days of the start of the episode. Extend course if new lesions appear during treatment or healing incomplete.</p> | <p>Advise abstinence until lesions have cleared.</p> <p>Patient information leaflets are available from the Herpes Viruses Association or the Family Planning Association.</p> | <p>First line: Aciclovir 400mg TDS for 5 days</p> <p>Or Aciclovir 200mg five times a day for 5 days</p> <p>Immunocompromised/ HIV patients: Aciclovir 400mg five times a day for 7-10 days</p> | <p>NICE Clinical Knowledge Summaries: Herpes simplex – genital</p> |
| Gonorrhoea | <p>Antibiotic resistance to gonorrhoea is now very high.</p> <p>Ideally, refer all people with confirmed or suspected gonorrhoea to a genito-urinary medicine (GUM) clinic or other local specialist sexual health service.</p> | | | <p>NICE Clinical Knowledge Summaries: Gonorrhoea</p> <p>Gonorrhoea and Antimicrobial Resistance CMO Letter Dec 2016</p> |

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
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| Pelvic inflammatory disease | <p>Refer women and contacts to GUM clinic.</p> <p>Start empirical antibiotics as soon as a presumptive diagnosis of PID is made clinically. Do not wait for swab results.</p> <p>Always culture for gonorrhoea and chlamydia. If gonorrhoea is likely use ceftriaxone regimen (28% of gonorrhoea isolates are now resistant to quinolones) or refer to GUM clinic.</p> | <p>Provide pain relief with ibuprofen or paracetamol.</p> <p>Advise of the need to use a barrier method of contraception (such as a condom) until both the woman and her partner(s) have completed treatment.</p> | <p>First line: Metronidazole 400mg BD for 14 days PLUS Ofloxacin ☹ 400mg BD for 14 days</p> <p>Or Metronidazole 400mg BD for 14 days PLUS Doxycycline 100mg BD for 14 days</p> <p>If high risk of gonorrhoea: ADD Ceftriaxone ☹ IM 500mg IM stat</p> | <p>NICE Clinical Knowledge Summaries: Pelvic inflammatory disease</p> |
| Trichomoniasis | <p>Treat partners and refer to GUM clinic.</p> | <p>Trichomoniasis is a sexually transmitted infection. Advise sexual abstinence until treatment is completed and any partners have also been treated and followed up.</p> | <p>First line: Metronidazole* tablets 400mg BD for 5-7 days</p> <p>Or Metronidazole* tablets 2g stat*</p> <p>*manufacturer advises avoid in pregnancy</p> <p>Alternative: Clotrimazole pessary 100mg pessary at night for 6 nights</p> | <p>NICE Clinical Knowledge Summaries: Trichomoniasis</p> |
| Vaginal candidiasis | <p>Topical and oral azoles give 75% cure.</p> <p>Pregnancy: Avoid oral azoles – use intravaginal</p> | | <p>First line: Clotrimazole pessary 500mg stat</p> <p>Or Clotrimazole vaginal cream 10% stat</p> <p>Or Fluconazole PO 150mg stat</p> <p>Alternative or pregnancy: Clotrimazole pessary 100mg at night for 6 nights</p> <p>Or Miconazole intravaginal cream 2% 5g BD for 7 days</p> | <p>NICE Clinical Knowledge Summaries: Candida – female genital</p> |

Eye and skin infections

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
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| Acne | <p>Treatment depends on the type and severity of acne. Patients with severe disease (e.g. nodulocystic acne) should be referred.</p> <p>Treat with oral antibiotics for at least 3 months if clinical improvement continues for a further 3 months. If no improvement try an alternative antibiotic before referral.</p> | <p>Lymecycline – lower risk of photosensitivity (once daily dosage), but 2½ times more expensive than doxycycline. Avoid in pregnancy, breastfeeding and patients younger than 12 years.</p> <p>AVOID MINOCYCLINE due to risk of liver damage.</p> | <p>Mild disease (comedonal): Benzoyl peroxide topical 5-10% gel applied 1-2 times daily after washing; start with lower strength preps</p> <p>Mild disease (inflammatory): .Oxytetracycline 500mg BD for up to 6 months</p> <p>Or Lymecycline 408mg OD for up to 6 months</p> <p>In combination with benzoyl peroxide</p> <p>If tetracyclines contraindicated: Clarithromycin 500mg BD – avoid in pregnancy</p> | <p>NICE Clinical Knowledge Summaries: Acne vulgaris</p> |
| Bites (human and animal) | <p>Determine whether the person is at increased risk of the wound becoming infected, either due to the nature of the bite or due to a medical condition (e.g. diabetes, immunosuppressed status).</p> <p>Human bites: prescribe prophylactic antibiotics for all human bite wounds under 72 hours old, even if there is no sign of infection.</p> <p>Animal bites: prescribe prophylactic antibiotics if the wound is less than 48 hours old and the risk of infection is high.</p> | <p>Thorough irrigation is important. Assess whether the wound is infected. The following may be present: redness, swelling, serosanguinous or purulent discharge, pain, localized cellulitis, lymphadenopathy, or fever.</p> <p>Assess risk of tetanus and rabies.</p> | <p>Prophylaxis or treatment of human, cat or dog bite: Co-amoxiclav Ⓢ 625mg TDS for 7 days</p> <p>Alternative (penicillin allergy): Human/ cat/ dog bites: Metronidazole 400mg TDS for 7 days PLUS Doxycycline PO 100mg BD for 7 days</p> <p>Or human bites only: Metronidazole 400mg TDS for 7 days PLUS Clarithromycin 500mg BD for 7 days AND review at 24 and 48 hours</p> <p>Avoid clarithromycin in pregnancy</p> | <p>NICE Clinical Knowledge Summaries: Bites – human and animal</p> |
| Cellulitis and wound infection | <p>Class I: patient afebrile and healthy other than cellulitis, use oral flucloxacillin alone</p> <p>Class II: febrile and ill, or co-morbidity, admit for IV treatment or use OPAT (if available)</p> <p>Class III: toxic appearance: admit. If river or sea water exposure, discuss with specialist.</p> | <p>Advice should be given on:</p> <ul style="list-style-type: none"> • The use of paracetamol or ibuprofen • Seeking immediate advice if antibiotics are not tolerated, skin signs worsen or systemic symptoms develop or worsen • Adequate fluid intake • Elevating the leg for comfort and to relieve oedema (where applicable) | <p>First line: Flucloxacillin 500mg – 1g* QDS for 7 days** *1g flucloxacillin dose is unlicensed</p> <p>Alternative (penicillin allergy): Clarithromycin 500mg BD for 7 days** - avoid in pregnancy</p> <p>If on statins: Doxycycline 200mg stat, then 100mg OD for 7 days**</p> <p>If unresolving: Clindamycin Ⓢ 300 – 450mg QDS for 7 days**</p> <p>If facial: Co-amoxiclav Ⓢ 625mg TDS for 7 days**</p> <p>**If slow response, continue antibiotics for a further 7 days</p> | <p>NHS Clinical Knowledge Summaries: Cellulitis – acute</p> |

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
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| Cold sores | Cold sores resolve after 7-10 days without treatment. Topical antivirals applied prodromally reduce duration by approximately 12-24 hours. | | | |
| Conjunctivitis | <p>Most bacterial cases of conjunctivitis are self-limiting. 65% resolve on placebo by day five. If symptoms persist for longer than 2 weeks they should reconsult for investigation of the cause.</p> <p>People should urgently seek medical attention if they develop marked eye pain or photophobia, loss of visual acuity, or marked redness of the eye.</p> <p>Treat with antibiotics if red eye with mucopurulent (not watery) discharge. Starts in one eye but may spread to both.</p> | <p>Remove contact lenses, if worn, until all symptoms and signs of infection have completely resolved and any treatment has been completed for 24 hours.</p> <p>Clean away infected secretions from eyelids and lashes with cotton wool soaked in water. Wash hands regularly, particularly after touching infected secretions, and to avoid sharing pillows and towels to avoid spreading infection.</p> | <p>First line (only if severe): Chloramphenicol 0.5% drops* Apply 1 drop every 2 hours for 2 days, then 4 hourly. Continue for 48 hours after healing.</p> <p>Or Chloramphenicol 1% eye ointment* Apply either at night (if eye drops used during the day) or 3-4 times daily (if eye ointment used alone). Continue for 48 hours after healing.</p> <p>*For patients who pay for prescriptions Chloramphenicol 0.5% eye drops (in max. pack size 10 mL) and 1% eye ointment (in max. pack size 4 g) can be purchased from pharmacies for treatment of acute bacterial conjunctivitis in adults and children over 2 years; max. duration of treatment 5 days. This is often less than a prescription charge.</p> <p>Alternative: Fusidic acid 1% modified release eye drops apply BD, continue for 48 hours after healing.</p> | <p>RCGP fact sheet: Management of infective conjunctivitis in primary care</p> <p>NICE Clinical Knowledge Summaries: Conjunctivitis – infective</p> |
| Eczema | Using topical antibiotics or adding them to steroids in eczema management encourages resistance and does not improve healing. | | In infected eczema, use antiseptic bath additives (e.g. Oilatum Plus) and treat with systemic antibiotics as for impetigo if clinically indicated. | NICE Clinical Knowledge Summaries: Eczema – atopic |
| Fungal proximal fingernail or toenail infection | <p>Self-care alone may be appropriate for people who are not bothered by the infected nail or who wish to avoid the possible adverse effects of drug treatment.</p> <p>Consider drug treatment if:</p> <ul style="list-style-type: none"> Walking is uncomfortable Abnormal-looking nails are causing significant psychological distress The person has diabetes, vascular disease, or a connective tissue disorder (because of a higher risk for secondary bacterial infections and cellulitis) The nail infection is thought to be the source of fungal skin infection The person is, or is likely to become, severely immunocompromised (for example with haematological malignancy or its treatment) <p>Take nail clippings: start therapy only if infection is confirmed by laboratory.</p> <p>For children seek specialist advice.</p> | <p>Discuss the likely benefits and adverse effects of treatment so the person can make a fully informed choice.</p> <ul style="list-style-type: none"> Treatment does not always cure the infection. Cure rates range between approximately 60–80% Treatment that eradicates the infection sometimes does not restore the nail's appearance to normal The drugs need to be taken for several months, or longer for resistant nails Unpleasant adverse effects can occur. These include headache, itching, loss of the sense of taste, gastrointestinal symptoms, rash, and fatigue. Although abnormal liver function tests are not uncommon, liver failure and other serious adverse effects are rare | <p>First line: Terbinafine tablets* 250mg OD:</p> <ul style="list-style-type: none"> Fingers: 6-12 weeks Toes: 3-6 months <p>* with oral terbinafine use monitor hepatic function before treatment and then every 4–6 weeks during treatment—discontinue if abnormalities in liver function tests.</p> <p>Terbinafine is fungicidal, so treatment time is shorter than with fungistatic imidazoles.</p> <p>Alternative: Itraconazole tablets 200mg BD for 7 days <u>in each month</u>:</p> <ul style="list-style-type: none"> Fingers: 2 courses Toes: 3 courses | NICE Clinical Knowledge Summaries: Fungal nail infection |

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
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| Fungal skin infection | <p>If intractable send skin scrapings.</p> <p>Scalp: discuss with specialist.</p> | <p>Evidence suggests topical terbinafine and imidazole (clotrimazole, miconazole and econazole) are more likely to cure fungal skin infections than placebo. There is evidence that terbinafine is associated with fewer treatment failures than topical imidazoles.</p> | <p>Treatment options:</p> <p>Terbinafine topical <i>Apply twice daily for 1-2 weeks</i></p> <p>Or Clotrimazole 1% cream <i>Apply twice to three times daily for at least 4 weeks</i></p> <p>Or Miconazole 2% cream <i>Apply twice daily continuing for 1-2 weeks after healing</i></p> <p>Or Ketoconazole (for adults only) <i>Apply once to twice daily</i></p> <p>Or Econazole <i>Apply twice daily</i></p> <p>OR (athlete's foot only) Undecanoate topical (Mycota®) <i>Apply twice daily continuing for 1-2 weeks after healing</i></p> | <p>NICE CKS: Fungal skin infection – body and groin</p> <p>NICE CKS: Fungal skin infection – foot</p> <p>NICE CKS: Fungal skin infection – scalp</p> |
| <p>Impetigo</p> <p>Also boils, carbuncles, folliculitis, staphylococcal paronychia and staphylococcal whitlow</p> | <p>For extensive, severe or bullous impetigo, use oral antibiotics.</p> <p>Reserve topical antibiotics for very localized lesions to reduce the risk of resistance.</p> <p>Soak and remove excess crust prior to application of topical therapy.</p> <p>Reserve mupirocin for MRSA.</p> | <p>Hygiene measures are important to aid healing and stop the infection spreading to other sites on the body and to other people.</p> <p>Children and adults should stay away from school or work until the lesions are dry and scabbed over, or, if the lesions are still crusted or weeping, for 48 hours after antibiotic treatment has started.</p> | <p>First line: Flucloxacillin <i>500mg-1g QDS for 7 days</i> For patients <18 years see latest BNF for children for accurate dosing information</p> <p>Alternatives (penicillin allergy): Clarithromycin <i>500mg BD for 7 days – avoid in pregnancy</i></p> <p>Children <12 years of age if liquid formulations are required: Erythromycin See latest BNF for children for accurate dosing information</p> <p>For localized lesions: Fusidic acid 2% topical <i>apply TDS for 5 days</i></p> <p>MRSA only: Mupirocin <i>TDS for 5 days</i></p> | <p>NICE Clinical Knowledge Summaries: Impetigo</p> <p>British Association of Dermatologists: Patient Information Leaflets</p> |
| Leg ulcers | <p>Antibiotics should only be prescribed in cases of active clinical infection, not for bacterial colonization, as bacteria will always be present.</p> <p>Signs of active infection include cellulitis, increased pain, pyrexia, purulent exudate and odour.</p> <p>If the person has an active infection, send pre-treatment swab. Review antibiotics after culture results.</p> | | <p>First line: Flucloxacillin <i>500mg – 1g* QDS for 7 days (if slow response continue for another 7 days)</i></p> <p>*1g flucloxacillin dose is unlicensed</p> <p>Alternative: Clarithromycin <i>500mg BD for 7 days (if slow response continue for another 7 days) – avoid in pregnancy</i></p> | <p>NICE Clinical Knowledge Summaries: Leg ulcer – venous</p> |

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
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| Mastitis | For information on treatment in primary care and referrals, please refer to NICE Clinical Knowledge Summaries. | | | NICE Clinical Knowledge Summaries: Mastitis and breast abscess |
| MRSA | <p>If active infection i.e. MRSA confirmed by lab results, and admission not warranted use sensitivities to guide treatment. If no response seek advice from microbiologist.</p> <p>Do not routinely treat with oral or topical antibiotics unless directed by microbiology.</p> | Reassure the person that infection with meticillin-resistant <i>Staphylococcus aureus</i> (MRSA) does not present a risk to healthy people in the community. | <p>Doxycycline 200mg stat, then 100mg BD for 7 days</p> <p>Alternative: Consult local microbiologist</p> | NICE Clinical Knowledge Summaries: MRSA in primary care |
| Pityriasis versicolor | <p>Initial treatment for pityriasis versicolor is with a topical antifungal. Ketoconazole shampoo for 5-7 days is recommended.</p> <p>Topical azole creams may be used, but large quantities may be needed.</p> <p>If pityriasis versicolor is extensive, or if topical treatment is ineffective, an oral antifungal drug (e.g. itraconazole) may be used for adults and children older than 12 years.</p> <p>Changes in skin pigmentation usually fully resolve within 2–3 months of starting antifungal treatment (but may persist for longer periods).</p> | | <p>First line: Ketoconazole topical 2% shampoo applied to the affected area once daily for 5 days; leave on for 3-5 minutes before rinsing</p> <p>For resistant/ widespread infection: Itraconazole 200mg OD for 7 days</p> | NICE Clinical Knowledge Summaries: Pityriasis versicolor |
| Scabies | <p>Treat whole body including scalp, face, neck, ears, under nails. Reapply to hands if washed within 8 hours of application.</p> <p>Simultaneously (within 24 hours) treat all household contacts, close contacts and sexual contacts (even in the absence of symptoms).</p> <p>Treat scabies that has become infected with an antibiotic.</p> | <p>Encourage the family not to delay treatment.</p> <p>Consider symptomatic treatment for itching (crotamiton). Advise the person that itching may take several weeks to resolve.</p> <p>Consider an oral sedating antihistamine (e.g. chlorphenamine) at night if the itch is interfering with sleep.</p> | <p>First line: Permethrin 5% dermal cream Repeat application after 7 days</p> <p>Alternative: Malathion 0.5% aqueous liquid Repeat application after 7 days</p> | NICE Clinical Knowledge Summaries: Scabies |

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
|---|--|--------------------------------------|---|---|
| Tick bites | <p>Prophylaxis not indicated if the bite occurred more than 72 hours ago, or if the patient is continually exposed to ticks.</p> <p>For treatment of localized erythema migrans see below.</p> <p>Treatment of later stages of Lyme disease – discuss with microbiologist.</p> | | <p>Treatment of localized erythema migrans: Doxycycline 100mg BD for 14 days</p> <p>Or Amoxicillin 500mg TDS for 14 days</p> <p>Alternative treatment of localized erythema migrans (penicillin allergy): Clarithromycin 500mg BD for 14 days for adults and children >12 years – avoid in pregnancy</p> <p>Erythromycin for children <12 years. See BNF for children for dosing information.</p> | <p>NICE Clinical Knowledge Summaries: Insect bites and stings</p> |
| Varicella zoster (chickenpox) and Herpes zoster (shingles) | <p>Pregnant/ immunocompromised/ neonate: seek urgent specialist advice.</p> <p>Chickenpox: if adult or severe pain/ secondary household case/ on steroids AND can start within 24 hours of rash, consider aciclovir.</p> <p>Shingles: treat if >50 years of age and within 72 hours of rash (PHN rare if <50 years); or if active ophthalmic or Ramsey Hunt or eczema.</p> | | <p>If treatment indicated: Aciclovir tablets 800mg five times a day for 7 days</p> <p>Alternative if compliance is a problem: Valaciclovir 1g TDS Or Famciclovir 500mg TDS or 750mg BD *please refer to your local formulary for status</p> | <p>NICE Clinical Knowledge Summaries: Chickenpox</p> <p>NICE Clinical Knowledge Summaries: Shingles</p> |

Other infections

| | When to treat | Prescribing notes and general advice | When treatment is needed | References and further information |
|--|---|---|--|--|
| Dental infections – emergency treatment | <p>Dental infections are always best treated by a dentist. GPs should not routinely be involved in dental treatment and, if possible, advice should be sought from the patient's dentist.</p> <p>Antibiotics are recommended if there are signs of severe infection, systemic symptoms or high risk of complications.</p> <p>Severe odontogenic infections; defined as cellulitis plus signs of sepsis, difficulty in swallowing, impending airway obstruction, Ludwig's angina. Refer urgently for admission to protect airway, achieve surgical drainage and IV antibiotics.</p> <p>The empirical use of cephalosporins, co-amoxiclav, clarithromycin and clindamycin do not offer any advantage for most dental patients and should only be used if no response to first line drugs when referral is the preferred option.</p> | <p>Regular analgesia should be first option until a dentist can be seen for urgent drainage, as repeated courses of antibiotics for abscess are not appropriate; repeated antibiotics alone, without drainage are ineffective in preventing spread of infection.</p> | <p><i>If pus drain by incision, tooth extraction or via root canal. Send pus for microbiology.</i></p> <p><i>If spreading infection</i> (lymph node involvement or systemic signs i.e. fever and malaise) consider concomitant metronidazole.</p> <p>First line: Amoxicillin 500mg TDS for up to 5 days (review at 3 days) (+/- metronidazole 400mg TDS if spreading infection)</p> <p>Or Phenoxymethylpenicillin 500mg – 1g QDS for up to 5 days (review at 3 days) (+/- metronidazole if spreading infection)</p> <p>In severe infection: Clindamycin ⊗ 300mg QDS for 5 days</p> <p>Or (penicillin allergy): Clarithromycin 500mg BD for up to 5 days (review at 3 days) (+/- metronidazole 400mg TDS if spreading infection) – avoid in pregnancy</p> | <p>NICE Clinical Knowledge Summaries: Dental abscess</p> |
| Suspected meningitis | <p>Transfer all patients to hospital immediately.</p> <p>Administer benzylpenicillin prior to admission, unless hypersensitive i.e. history of difficulty breathing, collapse, loss of consciousness, or rash.</p> | <p>Prevention of secondary cases:</p> <p>Only prescribe following advice from the Public Health England Health Protection Team.</p> <p>North East: telephone 0300 303 8596 (option 1)</p> <p>Cumbria: telephone 01228 606060</p> | <p>IV benzylpenicillin (give IM if vein cannot be found) Adults and children ≥10 years of age: 1200mg Children 1 – 9 years of age: 600mg Children <1 year of age: 300mg</p> <p>Or (penicillin allergy): IV/IM cefotaxime Adults and children ≥12 years of age: 1g Children <12 years of age: 50mg/kg</p> | <p>NICE Clinical Knowledge Summaries: Meningitis</p> |

Sepsis

Sepsis is a medical emergency. It is responsible for 37,000 deaths annually in the UK and sepsis has a fivefold higher mortality than STEMI or stroke. It is essential that sepsis is recognised early for the patient to reach hospital soon enough to avoid serious complication or death.

A high degree of vigilance is required for early identification of the septic patient. As well as the general impression at the time of initial assessment, the presence of abnormal observations should be enough to initiate evaluation for sepsis.

NICE guidance (the recognition, diagnosis and management of severe sepsis) is in development and is anticipated to be published in 2016. Please refer to the NICE website for further information.

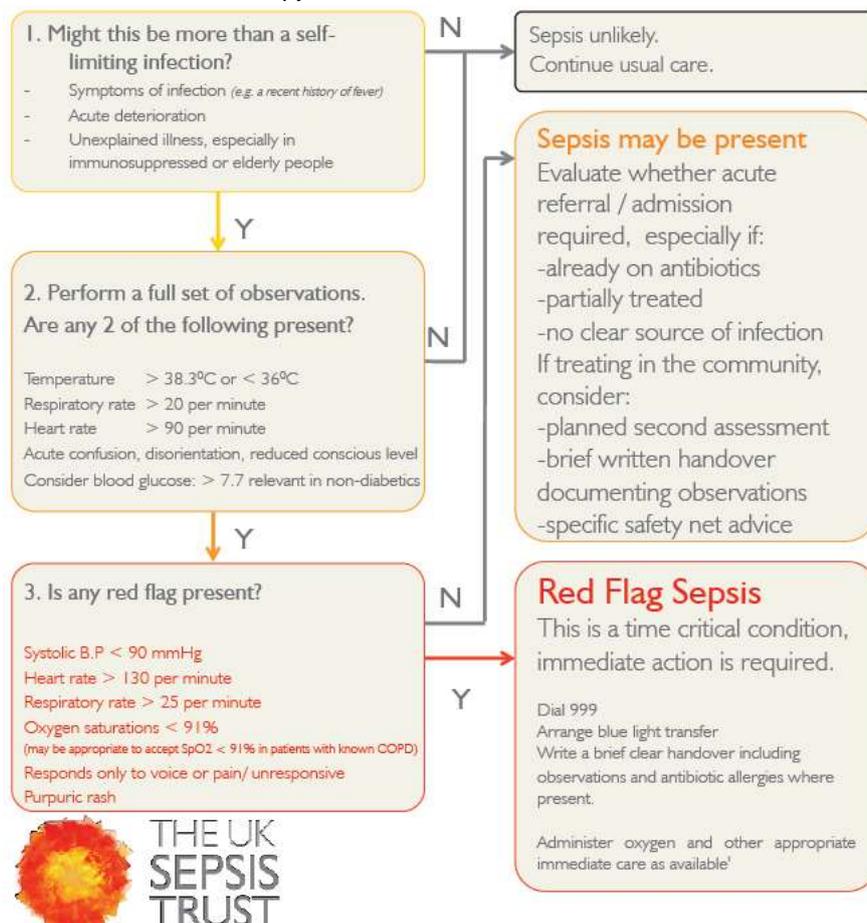
The UK Sepsis Trust have produced a [toolkit for primary care](#) which aims to make GPs and other primary care clinicians familiar with sepsis. It advises on specific safety netting in patients presenting with signs and symptoms of infection, ensuring that appropriate further assessment is undertaken and time-critical care is delivered rapidly when necessary.

General Practice Sepsis Screening and Action Tool¹

[This tool](#), produced by the UK Sepsis Trust, should be applied to all patients who are not pregnant who have a suspected infection or their clinical observations are outside of normal limits.

Patient groups to consider screening:

- With clinical evidence of systemic infection (such as recent history of fever)
- In whom you are considering antibiotic prescription or stewardship discussion
- You suspect to have 'flu'
- You suspect to have gastroenteritis
- Who are obviously unwell without clear cause
- Who are elderly or immunosuppressed and present with signs of infection
- Who have deteriorated on antibiotic therapy



¹ [UK Sepsis Trust General Practice Screening and Action Tool](#)

Clostridium difficile infection

Clostridium difficile (*C.diff*) can be present in the gut without causing illness. It is estimated to be present in the lower bowel of around 5% of the population.

The natural intestinal flora normally prevent overgrowth of *C.diff*, however when antimicrobial therapy is given to patients it can upset this and allow *C.diff* to multiply.

The toxins produced by *C.diff* damage the lining of the GI tract and cause symptoms ranging from mild diarrhoea to severe pseudomembranous colitis and toxic megacolon.

Which patients are most at risk of *Clostridium difficile* infection?

Patients are more at risk of *C.diff* infection if they are:

| High risk patient | High risk environment | High risk antibiotics (the 4Cs)? |
|---|---|--|
| <ul style="list-style-type: none">Older patients >65 yearsLong term conditions requiring frequent antibioticsRecent antibiotic exposure within previous 2 months | <ul style="list-style-type: none">Contact with <i>C.diff</i> patientsRecent hospital admissionInstitutionalised | <ul style="list-style-type: none">ClindamycinCiprofloxacin and other quinolonesCephalosporinsCo-amoxiclav |

Antibiotics and *Clostridium difficile* infection

Antibiotic exposure is associated with a significantly higher risk of *C.diff* infection than no antibiotics.

Risk of infection is greatest with:



1. Clindamycin
2. Quinolones
3. Cephalosporins
4. Penicillins
5. Macrolides
6. Sulphonamides or trimethoprim

PPIs and the risk of *Clostridium difficile* infection

Research shows that:

- Proton pump inhibitors (PPIs) are associated with near doubling of the likelihood of *C.diff* infection²
- Co-administration of PPIs and antibiotic increases the risk of *C.diff* infection beyond that conferred by either treatment alone³
- C.diff* infection risk is increased after even short duration of PPI use⁴

Commencing antibiotic therapy for *Clostridium difficile* infection

Antibiotic therapy for *C.diff* infection should be commenced as soon as possible, within 48 hours of prescribing.

If pharmacies are unable to supply, the prescription should be returned to the patient to try an alternative pharmacy. The patient's GP should be informed of any delay in supply and initiation of antibiotic therapy.

Ensure ALL cases of *Clostridium difficile* infection are Read coded as a major medical problem to inform future patient management.

² Deshpande A et al. Clin Gastroenterol Hepatol 2012;10(3):225-33.

³ Kwok CS et al. Am J Gastroenterol 2012;107(7):1011-9.

⁴ Barletta JF et al. Mayo Clinic Proceedings 2013;88(10):1085- 109.

Penicillin allergy

Adapted from [NICE guidelines CG183](#) (Drug allergy: diagnosis and management)

About 10% of the general population claim to have a penicillin allergy; this has often been because of a skin rash that occurred during a course of penicillin in childhood. Fewer than 10% of people who think they are allergic to penicillin are truly allergic. Therefore, penicillin allergy can potentially be excluded in 9% of the population. Studies have shown that people with a label of penicillin allergy are more likely to be treated with broad-spectrum, non-penicillin antibiotics, such as quinolones, vancomycin and third-generation cephalosporins. However, use of these antibiotics in people with an unsubstantiated label of penicillin allergy may lead to antibiotic resistance and, in some cases, sub-optimal therapy⁵.

Administering drugs to patients who have a reported allergy can be fatal, but inadvertent prescription or administration of such drugs is common. Data from the UK General Practice Research Database indicate that the incidence of contraindicated antibiotics being re-prescribed to patients with suspected penicillin allergy is as high as 48.5%, suggesting that even electronic systems with reminders do not eliminate the risk of inappropriate prescribing.

The British Society for Allergy and Clinical Immunology (BSACI) recommends giving patients written details about their allergy, including information on drugs they should avoid.

Documenting and sharing information with other healthcare professionals

When recording drug allergy status, ensure all the following has been documented as a minimum:

- The drug name
- The signs, symptoms and severity of the reaction ([see NICE guideline](#))
- The date when the reaction occurred

Ensure that information about drug allergy status is updated and included in all GP referral letters and hospital discharge letters.

Non-specialist management and referral to specialist services

NICE recommend referring people with a suspected allergy to beta-lactam antibiotics to a specialist drug allergy service if they:

- Need treatment for a disease or condition that can only be treated by a beta-lactam antibiotic **or**
- Are likely to need beta-lactam antibiotics frequently in the future (for example, people with recurrent bacterial infections or immune deficiency).

Antibiotic choices in penicillin allergy

Contra-indicated in penicillin allergy

- Amoxicillin
- Ampicillin
- Co-amoxiclav
- Flucloxacillin
- Penicillin V
- Pivmecillinam

Caution in penicillin allergy

Avoid if serious type 1 penicillin allergy (e.g. anaphylaxis/angioedema)

Use with caution if non-severe allergy (e.g. minor rash only)

- Cefaclor
- Cefalexin
- Cefotaxime
- Ceftriaxone

N.B. risk of allergic reaction is greater in β -lactams most similar to penicillins in underlying structure.

⁵ [NICE guidelines \[CG183\] Drug allergy: diagnosis and management \(September 2014\)](#)

Extended-Spectrum Beta-Lactamases (ESBLs)

ESBL-producing strains are bacteria that produce an enzyme called extended-spectrum beta lactamase, which makes them more resistant to cephalosporins e.g. cefuroxime, cefotaxime and ceftazidime, and makes the infections harder to treat. In many instances, only two oral antibiotics and a very limited group of intravenous antibiotics remain effective.

Community multi-drug resistant ESBL producing organisms are responsible for urinary tract infections which in many instances may only respond orally to nitrofurantoin or fosfomycin.

Fosfomycin for treatment of ESBLs

Fosfomycin is a broad spectrum antibiotic, licensed in the UK for the treatment of lower UTIs due to ESBL (extended-spectrum beta-lactamase) producing bacteria.

Fosfomycin should only be prescribed on the advice of a microbiologist.

Please note: Fosfomycin is not currently available on formulary in every CCG. Please refer to your local formulary for information on the status of fosfomycin in your CCG.

| | |
|---------------------------------|---|
| Indications for use | Fosfomycin is indicated for use in lower UTIs due to ESBL producing bacteria. Fosfomycin is not indicated for the treatment of ESBL pyelonephritis or peri-nephric abscess. Fosfomycin should only be considered for symptomatic patients where there are no other oral options suitable for the patient. |
| Licensing | The use of fosfomycin is licensed in the UK; however it is not available commercially in the UK and must be imported from abroad, making the product unlicensed. |
| Use of fosfomycin abroad | Fosfomycin is currently licensed and available commercially in most western European countries (Monuril®) and the USA (Monuro®). |
| Dosing | If fosfomycin is used, a single 3g dose is recommended in women. In men, a second 3g dose should be taken after 3 days. |

Prescribing fosfomycin in primary care

Different arrangements are currently in place in different CCGs for the prescribing of fosfomycin.

In some CCGs all prescribing of fosfomycin will take place in secondary care, however in other CCGs, prescribing may take place in primary care.

Please refer to your local formulary for information on the status of fosfomycin in your CCG.

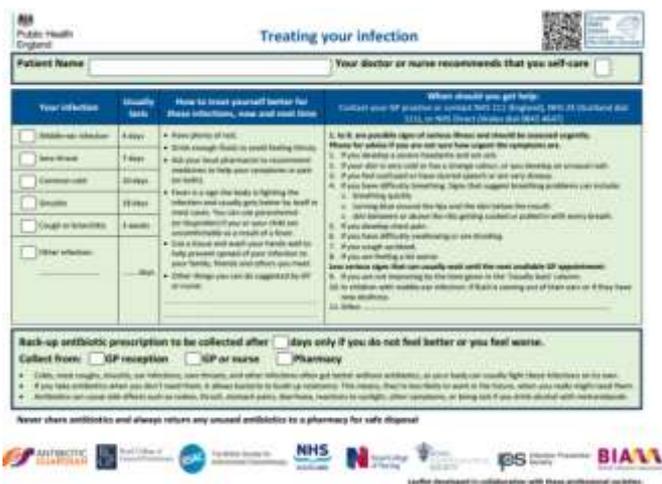
Resources to use in consultations with patients

Patient information leaflets

Evidence shows that the use of leaflets or booklets outlining the natural history of respiratory tract infections (and information about when to reconsult) can result in reduced antibiotic prescribing. Reductions in antibiotic prescribing have been shown to result in reductions in future demand for antibiotics.

Leaflets should be used as a tool for clinicians to interact with patients during the consultation, rather than as a 'parting gift' and can be used as part of a delayed prescription strategy.

Treating Your Infection leaflet



The [‘Treating Your Infection’ leaflet](#) is a useful tool for clinicians to use within consultations for patients who do not require an antibiotic prescription for their infection. It includes information on illness duration, self-care advice and advice on when to re-consult.

The leaflet is available to download from the [TARGET Antibiotics Toolkit](#) and is also available in a number of other languages. Alternative versions of the leaflet for use in [out of hours clinics](#) and [community pharmacies](#) are also available.

When Should I Worry booklet

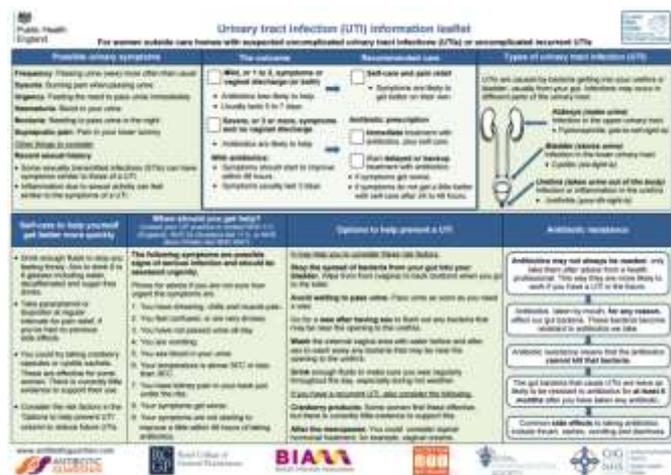


The [‘When Should I Worry’ booklet](#) provides information for parents about the management of respiratory tract infections such as coughs, colds, sore throats and ear ache in children.

It is designed to be shared in consultations and can be downloaded from the [When Should I Worry website](#). Printed booklets are available to order from the Royal College of GPs.

An [eLearning programme](#) for clinicians to support effective use of the booklet is also available on the [When Should I Worry website](#).

Urinary Tract Infection leaflet



The Patient Urinary Tract Infection (UTI) Information leaflet has been designed to be used during consultation with women who are experiencing non complicated UTIs. It is a useful tool for clinicians to use where the clinician feels that the patient does not require an antibiotic prescription. It includes information on illness duration, self-care advice, prevention advice and advice on when to re-consult. Use of this leaflet has been approved by PHE, RCGP, NHS Wales, Scottish UTI Network (SUTIN), RPS and BIA.

The leaflet is available to download in a number of languages from the [TARGET Antibiotics Toolkit website](#).

Get Well Soon Without Antibiotics leaflet



This Get Well Soon Without Antibiotics leaflet, produced by the Department of Health, explains the need to get the right treatment for common illnesses such as coughs and colds without encouraging antibiotic resistance.

It is available to download from the Department of Health website.

The leaflet is also available to [download in a number of other languages](#).

Shared decision making tools

Shared decision making tools can be useful in visualising and explaining treatment effects and possible side effects to patients.



⁶Cates plots ('smiley face' plots) compare the risks of an event in 100 or 1000 patients who receive treatment with the same number of patients who are not treated.

Plots are available online for acute otitis media in children, highlighting pain at 2-7 days in acute otitis media, and diarrhoea, vomiting or rashes in acute otitis media.

Go to <http://www.nntonline.net/visualrx/examples/> to see more.

⁶ From <http://www.nntonline.net/visualrx/examples/> (accessed 08 January 2016)

Resources for display in practices

Posters and information on display in prominent positions in GP practices can raise public awareness of the issues surrounding the use of antibiotics and can make a difference to the patients' expectations about when to expect antibiotics by influencing their social norms.

Posters for clinical and waiting areas

The Department of Health have produced a number of posters to display in healthcare settings to promote the appropriate use of antibiotics for patients presenting with a cold.

Posters can be downloaded from the [TARGET Antibiotics Toolkit website](#).



Videos for patient waiting areas

The Department of Health have produced a number of videos for display on screens in patient waiting areas. They can be accessed from the [TARGET Antibiotics Toolkit website](#).

European Antibiotics Awareness Day

European Antibiotics Awareness Day is held on 18th November each year. It is a Europe wide annual event that raises awareness on how to use antibiotics in a responsible way that will help keep them effective for the future.

Antibiotic Guardian campaign



[Antibiotic Guardian](#) supports the UK Antimicrobial Resistance Strategy, European Antibiotic Awareness Day and World Antibiotic Awareness Week and hosts a number of resources for healthcare professionals and the public.

Everyone in the UK, the public and medical community are asked to become an Antibiotic Guardian by choosing a pledge to use antibiotics more appropriately and help save these vital medicines from becoming obsolete. [Make your own pledge here](#).

Antibiotic audit resources

Practice level prescribing audits

Practices are encouraged to audit antibiotic use on a regular basis, especially use of high risk antibiotics, namely cephalosporins, quinolones and co-amoxiclav (the '3Cs'). This may support revalidation.

The antibiotics selected to investigate should be informed by prescribing reports and prescribing data. If this shows the practice is using significant amounts of a particular high risk antibiotic, an audit of that antibiotic will establish when and how it is being prescribed which should then be compared to guidance. Results of the audit should be shared within the wider practice and provide a basis for discussion amongst prescribers.

TARGET Antibiotics Toolkit audits

The TARGET Antibiotics Toolkit provides a number of templates for accurate and easy auditing of antibiotic prescribing, including Read codes, current guidance and action plans.

The following audit templates are available to download from the [TARGET website](#):

- Sore throat audit
- Urinary tract infection audit
- Otitis media audit
- Acute cough audit

Scottish Antimicrobial Prescribing Group audits

The [Scottish Antimicrobial Prescribing Group](#) have produced a comprehensive audit tool for the audit of primary care management of commonly encountered infections. The audit tool aims to provide prescribers with qualitative information on their prescribing of antibiotics.

Antimicrobial stewardship self-assessment checklist

A [short questionnaire for use by GP practices and CCGs](#) to assess antibiotic prescribing is available on the TARGET Antibiotics Toolkit.

The questionnaire provides practices with strategies to optimise prescribing of antibiotics and allows comparison to other practices locally and nationally. The questionnaire may be helpful for practices preparing for CQC inspections.

Educational resources for healthcare professionals

[NECS Antimicrobial Stewardship eLearning](#)

Developed to support clinicians in the North East and Cumbria understand why optimising antibiotic prescribing is important, and highlighting strategies to help prescribers promote effective antimicrobial stewardship.

[Health Education England/ e-LFH Reducing Antimicrobial Resistance eLearning package](#)

As part of the 5 year antimicrobial resistance strategy, Health Education England have developed eLearning for all healthcare professionals.

The updated Health & Social Care Act Code of Practice for Infection Prevention and Control now contains Antimicrobial Stewardship and recommends providers should ensure all prescribers receive induction and training in prudent antimicrobial use and are familiar with the antimicrobial resistance and stewardship competencies.

[Future Learn Antimicrobial Stewardship: Managing Antibiotic Resistance](#)

Delivered by the University of Dundee in partnership with the British Society for Antimicrobial Chemotherapy, this free online course is designed to help clinicians understand what antimicrobial stewardship is and how you can apply it everyday. Although the focus is for prescribing in the hospital setting, the skill set can be applied and adapted to other healthcare settings. The intention of the course is to stimulate and encourage further inquiry and learning in this important area.

[TARGET Antibiotic Resistance in Primary Care online course](#)

This course will assist you in identifying the need for optimised antibiotic prescribing, as well as equipping you with tools for improving your antibiotic prescribing. Evidence showing the link between prescribing and resistance rates in GP patients is explored and useful resources to use in your surgery are included.

[Skin Infections online course](#)

Skin infections are commonly seen in general practice. With ever increasing rates of antibiotic resistance, it is important for GPs to feel confident about making a diagnosis and to understand when antibiotic treatment is indicated. This course describes common presentations of bacterial, viral and fungal skin infections and outlines their management.

[MARTI Managing Acute Respiratory Tract Infections](#)

The MARTI series of training modules enables you to improve the care you provide to patients presenting with acute ear pain, acute sore throat, sinusitis and acute cough. The module equals two hours toward your CPD, and can import into the RCGP Revalidation portfolio. This online course has been developed through a partnership between the RCGP and Public Health England's Primary Care Unit. It was led by Dr Clodna McNulty and funded by an educational grant from the British Society for Antimicrobial Chemotherapy.

[Urinary Tract Infections](#)

This course explains the importance and appropriateness of diagnostics and offers advice on how to assess and treat patients with a range of urinary symptoms. It encourages reflection on how to minimise antibiotic resistance and offers 'real-life' cases. The module equals 1.5 hours toward your CPD, and can be imported into the RCGP Revalidation portfolio. This course has been developed in partnership with Public Health England's Primary Care Unit. It was funded by an educational grant from Public Health England.

[STAR Stemming the Tide of Antimicrobial Resistance](#)

STAR is a theory based 'blended learning' programme to promote appropriate antibiotic prescribing. The STAR programme was led by Professor Chris Butler and developed by a team at Cardiff University.

Changes from version 2.1

This guideline is an update of the North East and Cumbria antibiotic prescribing guideline for primary care version 2.1, published in June 2016.

Changes from version 1.2 are outlined in the table below:

| | |
|------------------------------|--|
| UTI in adults (lower) | <p>Treatment recommendations updated in line with Public Health England revised guidance published February 2017.</p> <p>Nitrofurantoin recommended first line. Trimethoprim recommended where nitrofurantoin contra-indicated and low risk of resistance. Pivmecillinam added as empirical treatment choice where nitrofurantoin contra-indicated, high risk of resistance or GFR <45ml/min.</p> <p>Prescribers are encouraged to use the TARGET UTI patient information leaflet during consultations.</p> |
| Acute prostatitis | <p>New condition added.</p> |
| Recurrent UTI | <p>Defined as 2 in 6 months or ≥3 UTIs per year, as per Public Health England guidance.</p> <p>Suggested doses and course lengths for nitrofurantoin (1st line) and pivmecillinam (2nd line) added for when antibiotics are indicated, in line with Public Health England guidance.</p> |

Acknowledgements

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NHS Darlington Clinical Commissioning Group
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NHS Newcastle Gateshead Clinical Commissioning Group
NHS North Durham Clinical Commissioning Group
NHS North Tyneside Clinical Commissioning Group
NHS Northumberland Clinical Commissioning Group
NHS South Tees Clinical Commissioning Group
NHS South Tyneside Clinical Commissioning Group
NHS Sunderland Clinical Commissioning Group
North Cumbria University Hospitals NHS Trust
North East Antimicrobial Pharmacists Group
North East Microbiologists Group
North of England Commissioning Support Medicines Optimisation Team
North of Tyne and Gateshead Area Prescribing Committee
North Tees and Hartlepool NHS Foundation Trust
Northern CCG Forum and Clinical Senate
Northumbria Healthcare NHS Foundation Trust
Public Health England Lead Public Health Microbiologist
South Tees Hospitals NHS Foundation Trust
South Tyneside Medicines Management Committee
South Tyneside NHS Foundation Trust
Sunderland Drug and Therapeutics Committee
Tees Medicines Governance Group

