



North Yorkshire antibiotic prescribing guideline for primary care

This prescribing guide has been produced 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.

Introduction to the North Yorkshire antibiotic prescribing guideline for primary care

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. Guidance published by NICE in August 2015 further reinforces the need for the development of this guidance and for all prescribers to practice in accordance with it.

Guideline review process

This is the 3rd version of a North Yorkshire guideline on antimicrobials. The working group that has overseen the review is made up of clinical microbiologists and primary care pharmacists from across the county, with consultation amongst a wider primary and secondary care audience.

These guidelines are based on a format produced by the North East and Cumbria – we are grateful to them for their support and permission to use their tools/documents.

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Foreword

These guidelines are intended to provide advice on the effective and safe treatment of common infections presenting in primary care in North Yorkshire. The guidelines incorporate previous NYPCT management of infection guidelines, and are largely based on the Public Health England (formerly HPA) Management of Infection Guidance for Primary Care.

Further information, evidence and references are available through the [Public Health England website](http://www.nice.org.uk/guidance/ng15/chapter/1-Recommendations) and some useful tools for patients and prescribers can be found on [page 26](#). This document is for guidance only. Its use and application should be based on the core principles of appropriate antibiotic prescribing as referenced in the NICE guideline published in August 2015: <http://www.nice.org.uk/guidance/ng15/chapter/1-Recommendations> with which all prescribers should be familiar.

Doses in this guideline, unless otherwise stated, are for adults; adjust for age, size and metabolic function. Refer to current BNF and BNF for children for further information.

10 steps for good antimicrobial prescribing practice

1. Prescribe an antibiotic only when there is likely to be a clear clinical benefit.
2. Do not prescribe an antibiotic for viral sore throat, simple coughs and colds.
3. Consider a no, or back-up (delayed), antibiotic strategy for acute self-limiting upper respiratory tract infections.
4. Limit prescribing over the telephone for exceptional cases.
5. Use simple generic antibiotics first whenever possible (see information in this guide).
6. Avoid broad spectrum antibiotics where a narrow spectrum agent will be effective.
7. Avoid widespread use of topical antibiotics (especially those agents also available as systemic preparations).
8. In pregnancy, AVOID tetracyclines, aminoglycosides, quinolones 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.
9. Document clinical indication, duration, dose and route in patient records.

10. Where a 'best guess' therapy has failed or special circumstances exist, microbiological advice can be obtained from your local clinical microbiologist.

Risk of *Clostridium difficile* infection

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

Ciprofloxacin, cephalosporins, clindamycin 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 by the use of the symbol ⚠ 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 treating penicillin allergic patients can be found on [page 25](#).

Microbiology contacts

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

York Teaching Hospitals NHS Trust – York site

01904 631313 and ask for the operator

York Teaching Hospitals NHS Trust – Scarborough site

01723 368111 and ask for the operator

Harrogate District Foundation Trust

01423 885959 and ask for Duty Clinical Microbiologist

South Tees NHS Trust - Friarage Hospital Northallerton site

Dr John Hovenden via medical secretary on 01642 282604

Dr James Dunbar, Dr Emma O'Cofaigh via medical secretary on 01609 762035

Also Dr James Dunbar can be contacted on 07967 136632 or Dr Emma O'Cofaigh on Tuesday, Wednesday and Friday on 07776 194073

Out-of-hours 01609 779911 and ask for the operator

Quick reference guide to common infections in primary care

This quick reference guide shows recommended first line drugs, adult doses and treatments for some of the more common infections in primary care. Please refer to the full guideline for full details.

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**, unless CENTOR criteria score 3 or 4, 90% resolve in 7 days without and pain only reduced by 16 hours.

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

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-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**. Consider back-up (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.

- **Amoxicillin 500mg TDS for 5 days** or **Doxycycline 200mg stat then 100mg OD for 5 days**

Urinary tract infections

UTI in men and non-pregnant women (no fever or flank pain)

- **Nitrofurantoin 100mg BD (modified release) or 50mg QDS (standard release) for 3 days in women/ 7 days in men** **OR**
- **Trimethoprim 200mg BD 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***
*continue treatment for a further 7 days if slow response

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

- **First line impetigo:** topical therapy with mupirocin (boils and carbuncles do not need antibiotics – they should be drained)
- **If severe or unresponsive to topical therapy:** **Flucloxacillin 500mg – 1g QDS for 7 days (see BNF-C for patients <18 years of age)**
- Penicillin allergy: **Clarithromycin 500mg BD for 7 days**
- 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 AND doxycycline 100mg BD for 7 days**

Antibiotics with the symbol ☹ are associated with an increased risk of *Clostridium difficile* infection. Counsel patients at risk to be alert for signs and symptoms of CDI and seek medical help if CDI develops.

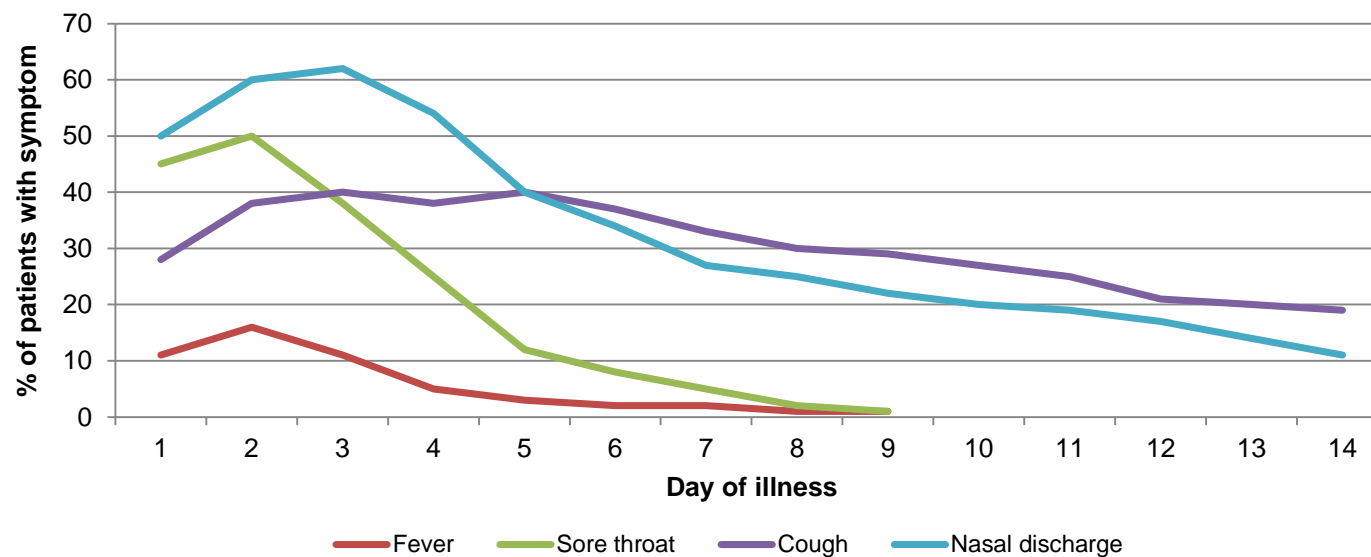
Upper respiratory tract infections

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

Consider a **back-up (delayed) antibiotic prescription strategy** ([see page 26](#)). Giving 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).

The chart below shows the natural history and average illness length for common respiratory tract infections:



Average total illness lengths for common respiratory tract infections:

Acute otitis media - 4 days

Acute sore throat/ acute pharyngitis/ acute tonsillitis - 1 week

Common cold - 1.5 weeks

Acute rhinositis - 2.5 weeks

Acute cough/ acute bronchitis - 3 weeks

See also [Appendix 1: Key points from the NICE care pathway for respiratory tract infections](#)

Upper respiratory tract infections

Illness	When to treat	Prescribing notes and general advice	When antibiotics are needed	References and further information
Acute sore throat	<p>Avoid antimicrobials. 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 back-up (delayed) antibiotic prescription strategy.</p> <p>Use Centor criteria score to help decide whether to prescribe an antibiotic.</p> <ul style="list-style-type: none"> A low Centor score (0-2) indicates a low chance of group A beta-haemolytic streptococci. Patients with 3-4 Centor score or history of otitis media consider a 2 or 3 day delayed antibiotic prescription strategy or immediate antibiotics. 	<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>Antimicrobials to prevent quinsy NNT > 4000.</p> <p>Antimicrobials to prevent otitis media NNT > 200.</p> <p>Routine use of throat swabs is discouraged unless results will be used to influence antibiotic management.</p>	<p>First line: Phenoxymethylpenicillin 500mg QDS for 10 days</p> <p>Alternative (penicillin allergy): Clarithromycin 250 – 500mg BD for 5 days</p>	<p>NICE Clinical Knowledge Summaries: Acute sore throat</p> <p>NICE CG 69: Respiratory tract infections – antibiotic prescribing</p>
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 back-up (delayed) antibiotic prescription strategy. If ear is discharging, send pus sample, start empirical antibiotics and modify following results.</p> <p>Public Health England suggest you consider a 2 or 3 day back-up (delayed) or immediate antibiotics for pain relief if:</p> <ul style="list-style-type: none"> <2 years with bilateral AOM (NNT = 4) or bulging membranes and ≥ 4 marked symptoms 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 <i>BNF for children</i> for accurate doses</p> <p>Alternative (penicillin allergy): Erythromycin* for children <12 years see latest <i>BNF for children</i> for accurate doses</p> <p>Clarithromycin* for children ≥12 years see latest <i>BNF for children</i> for accurate doses</p> <p>*macrolides concentrate intracellularly and so are less active against the extracellular <i>H. influenzae</i></p>	<p>NICE Clinical Knowledge Summaries: Otitis media</p> <p>NICE CG47: Feverish illness in children</p> <p>NICE CG69: Respiratory tract infections</p>
Acute otitis externa (AOE)	<p>It is important to exclude an underlying chronic otitis media before treatment is commenced. Many cases recover after thorough cleansing by healthcare professional of the external ear canal by suction or dry mopping.</p> <p>Cure rates are similar at 7 days for topical acetic acid or antibiotic +/- steroid.</p> <p>Reserve systemic antimicrobials for patients with systemic signs of infection or spreading cellulitis. Remember malignant otitis externa in patients with diabetes or other immunocompromise.</p>	<p>Ear swabs are not required routinely, but may be helpful for failure of therapy or recurrent cases. Results of susceptibility testing of topical antimicrobials do not correlate well with clinical outcome.</p> <p>NB: Use of antibacterial ear drops for more than 7 days is associated with an increased incidence of fungal infection.</p>	<p>First line: Acetic acid 2% spray (Ear-calm®)* 1 spray TDS for 7 days and analgesia</p> <p>*For patients who pay for prescriptions Ear-calm® spray is available to purchase from pharmacies for less than a prescription charge</p> <p>Alternative: flumetasone 0.02% + clioquinol 1% ear drops (Locorten-Vioform) 2-3 drops into the affected ear(s) BD</p>	<p>NICE Clinical Knowledge Summaries: Otitis externa</p>

Illness	When to treat	Prescribing notes and general advice	When antibiotics are needed	References and further information
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 back-up (delayed) antibiotic prescription strategy.</p> <p>Consider 7-day delayed or immediate antibiotic when fever >38°C, toothache.</p>	<p>Nasal swabs are unhelpful.</p> <p>Use adequate analgesia.</p>	<p>First line: Amoxicillin 500mg TDS for 7 days</p> <p>Alternative (penicillin allergy): Doxycycline 200mg stat then 100mg OD for 7 days</p> <p>Treatment failures (to cover anaerobic activity): Co-amoxiclav Ⓢ 625mg TDS for 7 days</p>	<p>NICE Clinical Knowledge Summaries: Sinusitis</p> <p>NICE CG69: Respiratory tract infections</p>

Lower respiratory tract infections

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

Do not use ciprofloxacin first line. Reserve all quinolone use for isolates where sensitivity is confirmed and there are no lower risk alternatives.

Illness	When to treat	Prescribing notes and general advice	When antibiotics are needed	References and further information
Acute cough, bronchitis	<p>Symptom resolution can take up to 3 weeks. Antibiotics are not indicated in people who are otherwise well.</p> <p>Care should be taken to exclude a differential diagnosis of pneumonia. 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</p> <p>>65 years of age and two of the above.</p> <p>Consider using CRP1 if pneumonia suspected. If CRP<20mg/L <i>no antibiotics</i>; 20-100mg/L <i>back-up (delayed) antibiotics</i>; CRP >100mg <i>immediate antibiotics</i>.</p>	<p>Sputum samples are generally unhelpful.</p> <p>Use paracetamol or ibuprofen as required, drink plenty of fluids.</p>	<p>Amoxicillin 500mg TDS for 5 days</p> <p>or</p> <p>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>Investigations are not normally required. Consider sputum cultures for:</p> <ul style="list-style-type: none"> • Frequent exacerbations • Treatment failure 	<p>Amoxicillin 500mg TDS for 5 days</p> <p>or</p> <p>Doxycycline 200mg stat, then 100mg OD for 5 days</p>	<p>NICE Clinical Knowledge Summaries: Chest infections</p> <p>NICE CG69: Respiratory tract infections – antibiotic prescribing</p>

Illness	When to treat	Prescribing notes and general advice	When antibiotics are 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. 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>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>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 • Score 3-4 urgent hospital admission. <p>Mycoplasma infection is rare in over 65s.</p>		<p>CRB-65=0</p> <p>First line: Amoxicillin 500mg TDS for 5 days*</p> <p>Alternative (penicillin allergy): Clarithromycin 500mg BD for 5 days*</p> <p>or</p> <p>Doxycycline 200mg stat, then 100mg OD for 5 days*</p> <p>*consider extending the course of the antibiotic to 7-10 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>CRB-65=1,2</p> <p>and able to be managed at home, clinically assess need for dual therapy to cover atypical pathogens:</p> <p>First line: Amoxicillin 500mg TDS for 7-10 days</p> <p>AND</p> <p>Clarithromycin 500mg BD for 7-10 days</p> <p>or</p> <p>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

Illness	When to treat	Prescribing notes and general advice	When antibiotics are needed	References and further information
UTI in non-pregnant women (no fever or flank pain)	<p>Do not treat asymptomatic bacteriuria; it is common particularly in over 65s but it is not associated with increased morbidity.</p> <p>Routine diagnostic and clearance cultures are not required where symptoms are clear cut. Send MSUs only for diagnostic uncertainty and failure of therapy.</p> <p>If severe/ ≥3 symptoms: treat (see CKS for details).</p> <p>If mild/ <2 symptoms: use dipstick to guide treatment (see CKS for details).</p> <p>Do not routinely dipstick. Please refer to SIGN guidance 88 for guidance on dipstick testing in the community.</p>	<p>Community multi-resistant extended-spectrum beta-lactamase <i>E.coli</i> is increasing: nitrofurantoin, pivmecillinam or fosfomycin are options depending on susceptibility (please refer to your own CCG formulary for status before prescribing).</p>	<p>Nitrofurantoin* or 50mg QDS (standard release) for 3 days</p> <p>or</p> <p>Trimethoprim 200mg BD for 3 days</p> <p>Second line: Perform culture in all treatment failures. Amoxicillin resistance is common; only use if susceptibility confirmed</p> <p>If pivmecillinam indicated, use higher dose i.e. 400mg TDS</p> <p>*contra-indicated in patients with eGFR<45ml/min. Short courses of nitrofurantoin may be used with caution in patients with eGFR 30-44ml/min. For further information see MHRA Drug Safety Update September 2014</p>	<p>NICE Clinical Knowledge Summaries: Urinary tract infection (lower) – women</p> <p>NICE Clinical Knowledge Summaries: Urinary tract infection (lower) – men</p> <p>SIGN guidance: Management of suspected bacterial UTI in adults</p>
UTI in men	<p>Diagnose with caution. Urethritis and prostatitis should be considered in young men. Underlying prostate issues should be considered in older men.</p> <p>Do not treat asymptomatic bacteriuria; it is common particularly in over 65s but it is not associated with increased morbidity.</p>	<p>Send MSU in all cases.</p>	<p>Nitrofurantoin* or 50mg QDS (standard release) for 7 days</p> <p>or</p> <p>Trimethoprim 200mg BD for 7 days</p> <p>*contra-indicated in patients with eGFR<45ml/min. Short courses of nitrofurantoin may be used with caution in patients with eGFR 30-44ml/min. For further information see MHRA Drug Safety Update September 2014</p>	
UTI in patients with catheters	<p>Bacteriuria is an almost inevitable consequence of urinary catheterization of more than a few days' duration. Routine CSU are of very little value and may lead to inappropriate antimicrobial therapy. Cloudy urine is not a reliable indicator of infection and should not be used to diagnose UTI.</p> <p>Review ongoing need for catheter – remove if possible.</p> <p>If symptoms of upper UTI (e.g., fever, loin pain); treat as for pyelonephritis. Management should include a change of catheter (if safe to do so) whilst on</p>	<p>Do not use dipstick testing to diagnose UTI in patients with catheters. Urinalysis for microbiological purposes of CSU in patients with an indwelling catheter is of almost no diagnostic value.</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>	<p>Therapy is not indicated for asymptomatic patients</p> <p>Evidence of upper UTI – treat as for pyelonephritis</p> <p>Catheter-associated UTI – treat on the basis of previous antibiotic susceptibilities or as for lower UTI</p> <p>Consider need for single dose of gentamicin at time of catheter change/removal. See PGD for further details if in use locally.</p>	<p>SIGN guidance: Management of suspected bacterial UTI in adults</p>

Illness	When to treat	Prescribing notes and general advice	When antibiotics are needed		References and further information
	<p>appropriate antibiotics.</p> <p>If patient has local symptoms related to catheter or problems with function (e.g. bypassing), consider change of catheter rather than antibiotics. If symptoms of catheter-associated UTI (e.g., suprapubic tenderness) commence antibiotics on the basis of previous susceptibilities (if available) or as per lower UTI guideline). Management should include a change of catheter (if safe to do so) whilst on appropriate antibiotics.</p> <p>A single dose of gentamicin is recommended in patients with certain risk factors undergoing catheterization, or following traumatic catheter removal, according to local protocol via patient group direction (PGD). See full document for details.</p>				
Recurrent UTIs (Non-pregnant women, ≥ 3 UTIs per year)	Send MSU and consider referral to urology.	To reduce recurrence, first advise simple measures including hydration, cranberry products. Then standby or post-coital antibiotics. Nightly prophylaxis reduces UTIs, but adverse effects and long term compliance poor.	Discuss options with a Clinical Microbiologist		
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 in first trimester if low folate status or on folate antagonist (e.g., antiepileptics)</p>	<p>First line: Nitrofurantoin* 50mg QDS (standard release) for 7 days *</p> <p>*contra-indicated in patients with eGFR<45ml/min</p> <p>or</p> <p>Amoxicillin (if susceptible) <i>500mg TDS for 7 days</i></p> <p>Alternative: Trimethoprim 200mg BD for 7 days (unlicensed) Also give folic acid 5mg daily if 1st trimester</p> <p>or</p> <p>Cefalexin 500mg BD for 7 days</p>		NICE Clinical Knowledge Summaries: Urinary tract infection (lower) – women
UTI in children	<p>Assess the risk of serious illness in line with NICE CG47 (feverish illness in children). Send pre-treatment MSU for all.</p> <p>Infants <3 months: urgently refer all infants less than 3</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</p>	<p>Lower UTI</p> <p>Trimethoprim for 3 days*</p> <p>or Nitrofurantoin for 3 days*</p>	<p>Upper UTI</p> <p>Specialist management only</p>	NICE Clinical Knowledge Summaries: Urinary tract infection – children

Illness	When to treat	Prescribing notes and general advice	When antibiotics are needed	References and further information
	months of age if UTI is suspected. Treat mildly unwell children aged 3 months and older. Use positive nitrite to guide.	example check that the child is passing adequate amounts of urine or is having wet nappies).	or Amoxicillin (if susceptible) <i>for 3 days*</i> or Cefalexin <i>for 3 days*</i> <i>*see BNF for children for accurate dosing information</i>	NICE CG54: Urinary tract infections in children
Acute pyelonephritis	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. If admission is not needed, send MSU for culture and sensitivities and start antibiotics. If no response within 24 hours, admit.		Cefalexin 500mg QDS <i>for 7-10 days</i> or Ciprofloxacin ☹ <i>500mg BD for 7 days* if severely penicillin allergic</i> <i>*may not be as effective in patients with renal impairment.</i>	NICE Clinical Knowledge Summaries: Pyelonephritis – acute

Gastrointestinal tract infections

Illness	When to treat	Prescribing notes and general advice	When antibiotics are needed	References and further information
<i>Clostridium difficile</i> infection	<p>ALL positive cases of <i>Clostridium difficile</i> infection (CDI) should be discussed with a clinical microbiologist prior to initiating treatment.</p> <p>Non-severe CDI: can be treated 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 ($<15 \times 10^9/L$), typically associated with 3-5 stools per day. Review progress daily. <p>Severe CDI: specialist treatment only. <u>Admit as an emergency.</u></p> <ul style="list-style-type: none"> Severe CDI: associated with WCC $>15 \times 10^9/L$ 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>Send stool sample in all suspected cases.</p> <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>Clostridium 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>Non-severe CDI – mild: do not treat</p> <p>Non-severe CDI - first episode: Metronidazole 400mg TDS for 10 days (70% of patients respond to metronidazole in 5 days; 92% in 7 days)</p> <p>If not responding contact local clinical microbiologist or infectious disease physician</p> <p>If second episode: Oral vancomycin 125mg QDS for 10 days or seek clinical microbiologist advice</p> <p>Please note: Vancomycin caps 125mg QDS cannot be administered via PEG.</p>	<p>NICE Clinical Knowledge Summaries: Diarrhoea – antibiotic associated</p>
Detection and eradication of <i>H.pylori</i>	<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. Treat all positives if known DU, GU or low grade MALToma. NNT in Non-Ulcer 14. Do not offer eradication for GORD 1C.</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>Retest for <i>H. pylori</i> 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>See local formulary or contact secondary care specialist for current regimes</p>	<p>NICE Clinical Knowledge Summaries: Dyspepsia – proven peptic ulcer</p> <p>NICE CG184: Dyspepsia and gastro-oesophageal reflux disease</p>
Diverticulitis	<p>People with mild, uncomplicated diverticulitis can be managed at home with paracetamol, clear fluids, and oral antibiotics. Arrange admission for people with diverticulitis when:</p> <ul style="list-style-type: none"> Pain cannot be managed with paracetamol 	<p>Prescribe broad-spectrum antibiotics to cover anaerobes and Gram-negative rods.</p> <p>Prescribe paracetamol for pain, if</p>	<p>Cefalexin 500mg TDS for 5 days</p> <p><u>AND</u></p> <p>Metronidazole 400mg TDS for 5 days</p>	

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	<ul style="list-style-type: none"> Hydration cannot be easily maintained with oral fluids, or oral antibiotics cannot be tolerated. The person is frail or has a significant comorbidity that is likely to complicate their recovery, particularly if they are immunocompromised (for example, severe infection; diabetes mellitus; renal failure; malignancy; cirrhosis; or the use of oral corticosteroids, chemotherapy, or immunosuppressive drugs). The person has any of the following suspected complications: <ul style="list-style-type: none"> Rectal bleeding that may require transfusion Perforation and peritonitis Intra-abdominal abscess Fistula. Symptoms persist after 48 hours despite conservative management at home. 	<p>required. If possible, avoid prescribing non-steroidal anti-inflammatory drugs and opioid analgesics (such as co-codamol) due to the increased risk of diverticular perforation.</p> <p>Recommend clear liquids only. Gradually reintroduce solid food as symptoms improve over 2–3 days.</p>		
Gastroenteritis	<p>Treatment should only be considered on the advice of a clinical microbiologist in severe or invasive infections (severe systemic upset and/or dysentery). Antibiotic therapy is not usually indicated unless systemically unwell. Fluid replacement essential. Do not use antimotility drugs if stools are bloody. Refer previously healthy children with acute painful or bloody diarrhoea to exclude <i>E.coli</i> O157 infection.</p> <p>Send stool specimens from suspected cases of food poisoning. Notify accordingly and seek advice on exclusion of patients from a Consultant in Communicable Disease on 01904 687100.</p>			
Traveller's diarrhoea	<p>Only consider standby antibiotics for remote areas or people at high-risk of severe illness with travellers' diarrhoea. For assessment of individual countries see the National Travel Health Network and Centre (NaTHNaC) website (www.nathnac.org).</p> <p>If a prescription is considered necessary for people travelling to remote areas, treatment should be via private prescription: give ciprofloxacin 500mg twice a day for 3 days. If quinolone resistance high (e.g., South Asia): consider bismuth subsalicylate (Pepto Bismol) 2 tablets QDS as prophylaxis or for 2 days treatment.</p>			NaTHNaC: Health Professionals – travellers' diarrhoea
Threadworms	<p>Treatment is recommended if threadworms have been seen or eggs detected.</p> <p>All household contacts should be treated simultaneously plus hygiene measures for 2 weeks.</p> <p>Avoid treatment in pregnancy.</p>	<p>Advise morning shower/ baths and hand hygiene.</p> <p>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.</p>	<p>Adults and children >6 months of age: Mebendazole 100mg single dose (a second dose may be needed after 2 weeks)</p> <p>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</p> <p>For patients who pay for prescriptions, mebendazole (suspension and chewable tablets) is available to purchase from pharmacies (for adults and children > 2 years) for less than a prescription charge</p>	NICE Clinical Knowledge Summaries: Threadworm BNF for Children: 5.5.1 Drugs for threadworms

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, gonorrhea, HIV, syphilis. **Refer to GUM clinic.**

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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>Refer to a GUM clinic who will arrange treatment, screening for other STIs, detailed information on STIs, and partner notification.</p> <p>Pregnancy – refer to GUM for specialist sexual health advice.0</p>	<p>Sexual intercourse should be avoided until both the person diagnosed with chlamydia and any partners have completed the course of treatment. (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>Test of cure not usually necessary unless in pregnancy when re-test after 5 weeks (6 if azithromycin) after completion of treatment.</p>	<p>Doxycycline 100mg BD for 7 days</p> <p>or</p> <p>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</p> <p>Erythromycin 500mg QDS for 7 days</p> <p>or</p> <p>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>
Vaginal candidiasis	<p>Diagnosis can be based on symptoms, pH and signs. Further investigations not routinely required.</p>	<p>Topical and oral azoles give 75% cure.</p> <p>Pregnancy: Avoid oral azole – use intravaginal.</p>	<p>First line: Clotrimazole pessary 500mg stat</p> <p>or</p> <p>Clotrimazole vaginal cream 10% stat</p> <p>or</p> <p>Fluconazole PO 150mg stat</p> <p>Alternative or pregnancy: Clotrimazole pessary 100mg at night for 6 nights</p> <p>or</p> <p>Miconazole intravaginal cream 2% 5g BD for 7 days</p>	<p>NICE Clinical Knowledge Summaries: Candida – female genital</p>

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Bacterial vaginosis	<p>Investigations are not routinely required. Diagnosis can be based on symptoms, pH and signs.</p> <p>Approximately 50% of women with BV are asymptomatic. When symptoms are present, BV is characterized by a fishy-smelling vaginal discharge.</p> <p>Women with asymptomatic bacterial vaginosis (BV) do not usually require treatment.</p> <p>Symptomatic women should be managed as per the treatment choices outlined.</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</p> <p>Metronidazole PO 2g stat (stat dose should not be used in pregnancy)</p> <p>Alternative:</p> <p>Metronidazole vaginal gel 0.75% 5g (1 applicatorful) intravaginally at night for 5 nights</p> <p>or</p> <p>Clindamycin cream 2% 5g (1 applicatorful) intravaginally at night for 7 nights</p>	<p>NICE Clinical Knowledge Summaries: Bacterial vaginosis – summary</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</p> <p>Metronidazole tablets 2g stat (stat dose should not be used in pregnancy)</p> <p>Alternative if metronidazole declined: Clotrimazole pessary 100mg pessary at night for 6 nights – gives symptom relief <u>not cure</u></p>	<p>NICE Clinical Knowledge Summaries: Trichomoniasis</p>
Pelvic inflammatory disease	<p>Refer women and contacts to GUM clinic.</p> <p>Exclude pregnancy.</p> <p>Start empirical antibiotics as soon as a presumptive diagnosis of PID is made clinically. Do not wait for swab results. Delay of effective treatment can increase risk of tubal damage.</p> <p>Always culture for gonorrhea and chlamydia. If gonorrhea is likely use ceftriaxone regimen (28% of gonorrhea isolates are now resistant to quinolones) or refer to GUM clinic.</p> <p>For further treatment options, seek specialist advice from GUM or a clinical microbiologist.</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: Ofloxacin ☹ 400mg BD for 14 days</p> <p><u>PLUS</u></p> <p>Metronidazole 400mg BD for 14 days</p> <p>Alternative IF HIGH RISK OF GONORRHOEA: Ceftriaxone ☹ IM 500mg IM stat</p> <p><u>PLUS</u></p> <p>Metronidazole 400mg BD for 14 days</p> <p><u>PLUS</u></p> <p>Doxycycline 100mg BD for 14 days</p>	<p>NICE Clinical Knowledge Summaries: Pelvic inflammatory disease</p>
Genital herpes	<p>Refer to GUM / 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>Advise abstinence until lesions have cleared.</p> <p>Patient information leaflets</p>	<p>First line: Aciclovir 400mg TDS for 5 days</p> <p>or</p> <p>Aciclovir 200mg five times a day for 5 days</p>	<p>NICE Clinical Knowledge Summaries: Herpes simplex –</p>

Illness	When to treat	Prescribing notes and general advice	When antibiotics are needed	References and further information
	Commence treatment within 5 days of the start of the episode. Extend course if new lesions appear during treatment or healing incomplete.	are available from the Herpes Viruses Association or the Family Planning Association .	Immunocompromised/HIV patients: Aciclovir 400mg five times a day for 7-10 days	genital
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>Four weeks treatment may prevent chronic prostatitis.</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: Trimethoprim 200mg BD for 28 days</p> <p>Second line: Ciprofloxacin Ⓢ 500mg BD for 28 days (quinolones achieve higher prostate levels)</p>	NICE Clinical Knowledge Summaries: Prostatitis – acute
Epididymo-orchitis	Assess likelihood of STI – test for chlamydia and <i>N. gonorrhoeae</i> in sexually active males AND send MSU. Then treat as STI or urinary based on clinical assessment/results.		<p>If infection likely to be caused by sexually transmitted pathogen, e.g., high risk of gonorrhoea: Ceftriaxone IM 500mg intramuscular injection stat</p> <p><u>PLUS</u></p> <p>Doxycycline 100mg BD for 14 days</p> <p>If infection likely to be due to chlamydia or other non-gonoccal organisms: Doxycycline 100mg BD for 10-14 days</p> <p>If infection not likely to be due to any sexually transmitted pathogen, treat as for cystitis.</p>	

Eye and skin infections

Illness	When to treat	Prescribing notes and general advice	When antibiotics are needed	References and further information
Conjunctivitis	<p>Eye swabs are not necessary except in neonates.</p> <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 re-consult 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.</p> <p>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 (whilst awake). Continue for 48 hours after healing</p> <p>PLUS Chloramphenicol 1% eye ointment* Apply at night. 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 4g) 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% gel 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>
Impetigo Also boils, carbuncles, folliculitis, staphylococcal paronychia and staphylococcal whitlow	<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>Localized staphylococcal lesions such as boils should be drained rather than treated with antibiotics.</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>For localised lesions: Mupirocin 2% ointment topical apply TDS for 5 days</p> <p>For treatment failures or more extensive lesions: Flucloxacillin PO 500mg-1g QDS for 7 days</p> <p>For patients <18 years see latest BNF for children for accurate dosing information</p> <p>Alternatives: If penicillin allergic: Clarithromycin 500mg BD for 7 days</p> <p>Children <12 years of age if liquid formulations are required: Erythromycin See latest BNF for children for accurate dosing information</p>	<p>NICE Clinical Knowledge Summaries: Impetigo</p> <p>British Association of Dermatologists: Patient Information Leaflets</p>
Scabies	<p>Treat whole body including scalp, face, neck, ears, under nails. Reapply treatment if washed off during treatment period.</p> <p>Simultaneously (within 24 hours) treat all household contacts, close contacts and sexual contacts (even in the absence of symptoms).</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>First line: Permethrin 5% dermal cream Repeat application after 7 days (Average sized adult will require a total of 3 x 30g tubes to cover 2 applications)</p> <p>Alternative: Malathion 0.5% aqueous liquid Repeat application after 7 days</p>	<p>NICE Clinical Knowledge Summaries: Scabies</p>

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		Consider an oral sedating antihistamine (e.g., chlorphenamine) at night if the itch is interfering with sleep.		
Eczema	Using topical antibiotics or adding them to steroids in eczema management encourages resistance and does not improve healing.	If infection is suspected, swab and treat according to the results.	In infected eczema, use antiseptic bath additives and treat with systemic antibiotics as for impetigo if clinically indicated	NICE Clinical Knowledge Summaries: Eczema – atopic
Cellulitis and wound infection	<p>If patient afebrile and healthy other than cellulitis, use flucloxacillin alone. If febrile and ill, use IV treatment.</p> <p>If river or sea water exposure, or severe facial cellulitis, discuss with a clinical microbiologist.</p> <p>Facial cellulitis – admit urgently unless mild.</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>Bilateral red legs are rarely caused by cellulitis.</p> <p>Suggest early discussion of treatment failures with Clinical Microbiologist/ Infectious Diseases Physician. Out-patient and home parenteral antibiotic therapy may be indicated in some circumstances.</p>	<p>First line: Flucloxacillin 500mg QDS for 7 days (if slow response continue for another 7 days)</p> <p>Alternative (penicillin allergy): Clarithromycin 500mg BD for 7 days (if slow response continue for another 7 days)</p> <p>Facial cellulitis - mild: flucloxacillin 500mg QDS for 7 days (if slow response continue for another 7 days)</p> <p>Alternative (penicillin allergy): Clarithromycin 500mg BD for 7 days (if slow response continue for another 7 days)</p>	NHS Clinical Knowledge Summaries: Cellulitis – acute
Leg ulcers	<p>Antibiotics should only be prescribed in cases of active clinical infection, not for bacterial colonisation, as bacteria will always be present.</p> <p>Signs of active infection include cellulitis, increased pain, pyrexia, purulent exudate and odour. Refer for specialist opinion if severe.</p> <p>If the person has an active infection, send pre-treatment swab. Review antibiotics after culture results.</p>	Sampling for culture requires wound cleaning with saline then vigorous curettage and aspiration or a swab taken from the leading edge of the infected area. Swabs from the open surface of an unclean ulcer are usually unhelpful and are costly (approximately £20 each). For dressings advice contact the tissue viability nurse.	<p>First line: Flucloxacillin 1g* QDS for 7 days (if slow response continue for another 7 days)</p> <p>*1g flucloxacillin dose is unlicensed</p> <p>Alternative: Clarithromycin 500mg BD for 7 days (if slow response continue for another 7 days)</p>	NICE Clinical Knowledge Summaries: Leg ulcer – venous

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	Diabetic leg ulcer – refer foot ulcers for specialist podiatry opinion or refer to local CCG guidance for pathway.			
MRSA	<p>See PHE guidance PHE MRSA</p> <p>If active infection, i.e., MRSA confirmed by lab results, and admission not warranted, discuss therapy with a Clinical 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.	To be guided by Clinical Microbiologist	NICE Clinical Knowledge Summaries: MRSA in primary care
Bites (human and animal)	<p>If wound >72 hours old at time of presentation, and no signs/symptoms of local infection or systemic illness, DO NOT prescribe antibiotics.</p> <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.</p> <p>Animal bites: prescribe prophylactic antibiotics if cat bite/puncture wound; bite to hand, foot, face, joint, tendon, ligament; immunocompromised/diabetic/asplenic/cirrhotic/presence of prosthetic valve or prosthetic joint.</p>	<p>Thorough irrigation is most 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>Human bites: assess risk of tetanus, HIV, hepatitis B and C.</p> <p>Animal bites: 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 bites: Metronidazole 400mg TDS for 7 days</p> <p><u>PLUS</u></p> <p>Clarithromycin 500mg BD for 7 days</p> <p><u>AND</u></p> <p>Review at 24 and 48 hours</p> <p>Alternative (penicillin allergy) animal bites: Metronidazole 400mg TDS for 7 days</p> <p><u>PLUS</u></p> <p>Doxycycline PO 100mg BD for 7 days</p>	NICE Clinical Knowledge Summaries: Bites – human and animal
Fungal skin infection	If intractable, send skin scrapings. Surface must be cleaned with alcohol swab before sampling to remove surface bacteria. Take skin scrapings from leading edge of affected area of skin. Mycology specimens are transported in special black transport envelopes. Oral treatment may be recommended if infection confirmed. Scalp: discuss with dermatologist.		<p>First line: clotrimazole 1% cream apply BD for 4-6 weeks</p> <p>or</p> <p>Terbinafine 1% cream apply BD for 1-2 weeks</p> <p>or</p> <p>(athlete's foot only) Undecanoate topical (Mycota®) BD continuing for 1-2 weeks after healing</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>

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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>Take nail clippings: start therapy only if infection is confirmed by laboratory. Surfaces must be cleaned with alcohol swab before sampling to remove bacteria. Softened material collected from nail bed under nail plate or deep shavings from nail after removal of surface nail. Mycology specimens are transported in special black transport envelopes.</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"> This is a disease of the nail bed rather than the nail plate. 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>Superficial only: treatment on the NHS not recommended</p> <p>First line: Terbinafine tablets 250mg OD:</p> <ul style="list-style-type: none"> Fingers: 6-12 weeks Toes: 3-6 months <p>Terbinafine is fungicidal, so treatment time is shorter than with fungistatic imidazoles.</p> <p>Second-line: Itraconazole capsules 200mg BD for 7 days <u>in each month</u>:</p> <ul style="list-style-type: none"> Fingers 2 courses Toes: 3 courses 	<p>NICE Clinical Knowledge Summaries: Fungal nail infection</p>
Varicella zoster (chickenpox) and Herpes zoster (shingles)	<p>Pregnant/immunocompromised/neonate: seek urgent specialist advice.</p> <p>Chickenpox: consider aciclovir if can be started within 24 hours of rash and:</p> <ul style="list-style-type: none"> >14 years or severe pain or dense rash or secondary household case or steroids or smoker. 		<p>If treatment indicated: Aciclovir dispersible tablets 800mg five times a day for 7 days</p> <p><i>Child doses – see BNF for children</i></p> <p>Second line SEEK ADVICE from a clinical microbiologist</p>	<p>NICE Clinical Knowledge Summaries: Chickenpox</p> <p>NICE Clinical Knowledge Summaries: Shingles</p>

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	Shingles: treat if <ul style="list-style-type: none"> • >50 years of age and within 72 hours of rash (PHN rare if <50 years) or • if active ophthalmic or • Ramsey Hunt or • eczema. 			
Cold sores	Cold sores resolve after 7-10 days without treatment. Topical antivirals applied prodromally reduce duration by approximately 12-24 hours – used after the prodromal phase are totally ineffective.			

Suspected meningitis

Illness	When to treat	Prescribing notes and general advice	When antibiotics are needed	References and further information
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: Only prescribe following advice from the Public Health England (PHE) Health Protection Team.</p> <p>Notification of suspected disease: Completed register practitioner notification forms should be sent to: PHE - North Yorkshire and Humber Team, FERA, Sand Hutton, YO41 1LZ OR faxed to: 01904 468051</p> <p>For further information/advice or to notify urgently, please telephone the PHE on 01904 687100 or out-of-hours please telephone 0114 304 9909</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</p> <p>(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>

Illness	When to treat	Prescribing notes and general advice	When antibiotics are 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</i> drain by incision, tooth extraction or via root canal. Send pus for microbiology</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 for 5 days if spreading infection)</p> <p>or</p> <p>Phenoxymethylpenicillin 500mg – 1g QDS for up to 5 days (review at 3 days) (+/- metronidazole if spreading infection)</p> <p>(penicillin allergy): Clarithromycin 500mg BD for up to 5 days (review at 3 days) (+/- metronidazole if spreading infection)</p> <p>In severe infection: arrange hospital admission</p>	<p>NICE Clinical Knowledge Summaries: Dental abscess</p>

Clostridium difficile infection

Clostridium difficile infection (CDI) 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 *Clostridium difficile* (*C. difficile*), however when antimicrobial therapy is given to patients it can upset this and allow *C. difficile* to multiply.

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

Prudent antimicrobial prescribing¹

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 back-up (delayed) prescriptions ([see page 26](#)) in case symptoms worsen or become prolonged.

If an antimicrobial is required, follow the treatment recommendations in this guide, choosing a narrow spectrum agent where possible.

Broad spectrum antibiotics should be reserved for the treatment of serious infections when the pathogen is not known.

Which patients are most at risk of CDI?

Patients are more at risk of CDI if they are:

High risk patient

- Older patients >65 years
- Long term conditions requiring frequent antibiotics
- Recent antibiotic exposure within previous 3 months
- Previous history of *C. difficile*

High risk environment

- Contact with *C. difficile* patients
- Recent hospital admission
- Institutionalised

High risk antibiotics (the 4Cs)?

- Clindamycin
- Ciprofloxacin and other quinolones
- Cephalosporins
- Co-amoxiclav

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

Antibiotics and *C. difficile* infection²

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

Risk of infection is greatest with:



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

When can broad spectrum antibiotics be recommended?

There are few indications for broad spectrum cephalosporins or quinolones in primary care.

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

Bottom line

Ciprofloxacin,

Cephalosporins,

Clindamycin,

Co-amoxiclav and other 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 this guidance.

¹ UKMi Medicine Q&As (2012) *Clostridium difficile* infection – which antimicrobials are indicated?

² Deshpande et. al. (2013) Community-associated *Clostridium difficile* infection and antibiotics: a meta-analysis. *J.Antimicrob. Chemother.* 68 (9): 1951-1961.

Treating penicillin allergic patients

Penicillins are among the most useful and frequently prescribed antibiotics; however as with all medicines they can cause adverse reactions. These include allergic reactions ranging from mild rash to life threatening anaphylaxis.

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

Allergy is one of the most common and important adverse effects of penicillin and related drugs such as amoxicillin (including co-amoxiclav), flucloxacillin and piperacillin.

Anaphylaxis is rare, with an estimated frequency of 1-5 per 10,000 courses administered, but can be fatal. Furthermore the chemical structure of cephalosporins (cefalexin, cefuroxime etc.) is similar to that of penicillins and cross-sensitivity can occur in up to 10% of patients.

Any patient describing anaphylaxis following penicillin exposure must not be prescribed any penicillin again, nor any cephalosporin.

More commonly penicillin hypersensitivity manifests as a rash, the typical presentation being a maculopapular, erythematous rash symmetrically disposed over the legs, buttocks and trunk.

In these patients penicillins should be avoided in future, but cephalosporins are generally not withheld since the consequences of cross-sensitivity are less serious.

Very rarely penicillins can cause pemphigus vulgaris or pemphigoid-like reactions. Penicillins and cephalosporins should not be prescribed to these patients.

Patients often describe side effects such as diarrhoea or nausea as 'allergies', so careful history taking is extremely important to distinguish between true allergy and manageable side effects. Similarly patients reporting minor rashes restricted to small areas of the body, or who develop rashes more than 72 hours after exposure, probably do not have genuine hypersensitivity. For serious infections for which penicillins are the preferred treatment, vague histories of such reactions do not contra-indicate penicillin use. Discuss with microbiology if necessary.

It is also worth noting that maculo-papular rashes can also occur in patients treated with either ampicillin or amoxicillin who have concomitant viral infections such as glandular fever. Such reactions are not allergic phenomena and do not contra-indicate future use of these or related drugs.

Antibiotic choices

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

Back up (delayed) prescribing and patient information leaflets

Back up (delayed) prescription strategies

A back up (delayed) prescription strategy aims to reduce the usage of antibiotics while providing a safety net for people who genuinely need antibiotics.

Usually the person should be advised to use the antibiotic prescription only if their condition has deteriorated *within* 3 days or not improved *after* 3 days.

The strategy can be implemented in a number of ways including:

- People may be issued a script and advised not to redeem it unless it is required. If necessary, the prescription can be post-dated.
- People can be asked to re-attend the GP surgery reception after 3 days to collect the prescription (if required). If symptoms significantly deteriorate before this time, a telephone consultation can be considered.
- Always give advice and reassure the patient as well as giving the prescription. Consider giving written advice (such as a patient information leaflet).

Patient information leaflets

There is evidence that the use of leaflets or booklets outlining the natural history of respiratory tract infections (and information about when to re-consult) can result in reduced antibiotic prescribing³. Reductions in antibiotic prescribing have been shown to result in reductions in future demand for consultations.

Self-care advice booklet for parents

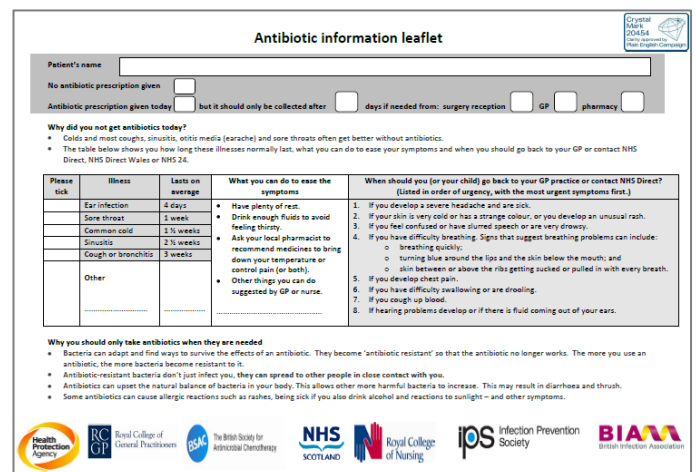
Advice booklets are available from the “When Should I Worry” website, designed by researchers at Cardiff University:

<http://www.whenshouldiworry.com/>

These have been designed to provide information for parents about the management of respiratory tract infections (coughs, colds, sore throats, and ear aches) in children, for use in primary care consultations.

TARGET patient information leaflet

The [TARGET Antibiotics toolkit](#), produced by the Royal College of General Practitioners, provides patient information leaflets for clinicians to use within consultations.



The image shows a patient information leaflet titled "Antibiotic information leaflet". It includes a section for patient details, a table for common illnesses and their durations, and a section for when to seek medical help. The leaflet is designed to be filled out by a clinician and given to the patient.

Please tick	Illness	Lasts on average	What you can do to ease the symptoms	When should you (or your child) go back to your GP practice or contact NHS Direct? (Listed in order of urgency, with the most urgent symptoms first.)
	Ear infection	4 days	• Have plenty of rest.	1. If you develop a severe headache and are sick.
	Sore throat	1 week	• Drink enough fluids to avoid feeling thirsty.	2. If your skin is very cold or has a strange colour, or you develop an unusual rash.
	Common cold	1 ½ weeks	• Ask your local pharmacist to recommend medicines to bring down your temperature or control pain (for both).	3. If you feel confused or have slurred speech or are very drowsy.
	Sinusitis	2 ½ weeks	• Other things you can do suggested by GP or nurse.	4. If you have difficulty breathing. Signs that suggest breathing problems can include: <ul style="list-style-type: none">o breathing quickly;o turning blue around the lips and the skin below the mouth; ando skin between or above the ribs getting sucked or pulled in with every breath.
	Cough or bronchitis	3 weeks		5. If you develop chest pain.
	Other			6. If you have difficulty swallowing or are drooling.
				7. If you cough up blood.
				8. If hearing problems develop or if there is fluid coming out of your ears.

Why you should only take antibiotics when they are needed

- Bacteria can adapt and find ways to survive the effects of an antibiotic. They become "antibiotic resistant" so that the antibiotic no longer works. The more you use an antibiotic, the more bacteria become resistant to it.
- Antibiotic-resistant bacteria don't just infect you, they can spread to other people in close contact with you.
- Antibiotics can upset the natural balance of bacteria in your body. This allows other more harmful bacteria to increase. This may result in diarrhoea and thrush.
- Some antibiotics can cause allergic reactions such as rashes, being sick if you also drink alcohol and reactions to sunlight – and other symptoms.

Logos at the bottom include: Health Protection Agency, RCGP, Royal College of General Practitioners, BSA, The British Society for Antimicrobial Chemotherapy, NHS Scotland, Royal College of Nursing, IPS Infection Prevention Society, and BIAAM British Infection Association.

The TARGET Patient Antibiotic Information Leaflet is also available to download in Polish, Mandarin, Gujarati, Hindi and Bengali.

³ TARGET Antibiotics toolkit: Patient Information Leaflet Training Document

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

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 clinical microbiologist.

Indications for use

Fosfomycin is indicated for use in lower UTIs due to multiresistant coliforms including ESBL producing bacteria. Fosfomycin is not indicated for the treatment of pyelonephritis or peri-nephric abscess.

Fosfomycin should only be considered for symptomatic patients where there are no other oral options suitable for the patient.

ESBLs

ESBL (Extended-Spectrum Beta-Lactamase)-producing strains are bacteria that produce enzymes, 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.

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.

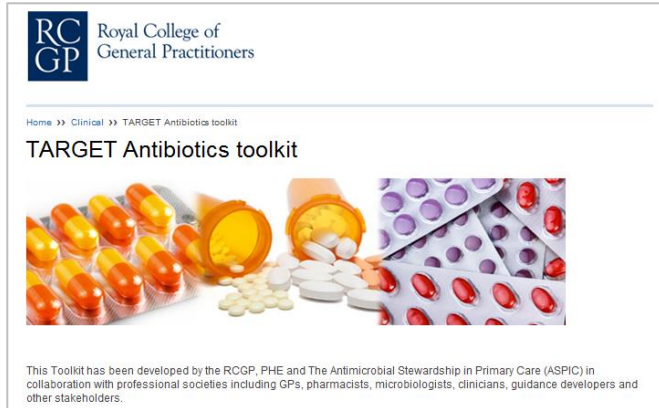
Prescribing fosfomycin in primary care

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.

TARGET antibiotics toolkit

<http://www.rcgp.org.uk/clinical-and-research/target-antibiotics-toolkit.aspx>



The TARGET toolkit has been developed by the RCGP, PHE and The Antimicrobial Stewardship in Primary Care (ASPIC) in collaboration with professional societies including GPs, pharmacists, clinical microbiologists, clinicians, guidance developers and other stakeholders.

The toolkit provides a wealth of information about antibiotic prescribing including:

- Patient information leaflets
- Resources for clinicians
- Training resources to help fulfil CPD and revalidation requirements
- Audit toolkits
- Self-assessment checklist providing strategies to help optimize antibiotic prescribing in primary care

STAR educational program

<http://www.stemmingthetide.org/>

The STAR educational program was developed in response to concern about the rise in antibiotic resistance and the pressures to use antibiotics in everyday clinical practice.

Linked to the STAR study – can the inappropriate use of antibiotics in general medical practice be reduced across a whole practice population without either increasing hospitalisations or re-consultation rates?

Acknowledgements

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Harrogate and District NHS Foundation Trust

Harrogate and Rural District CCG

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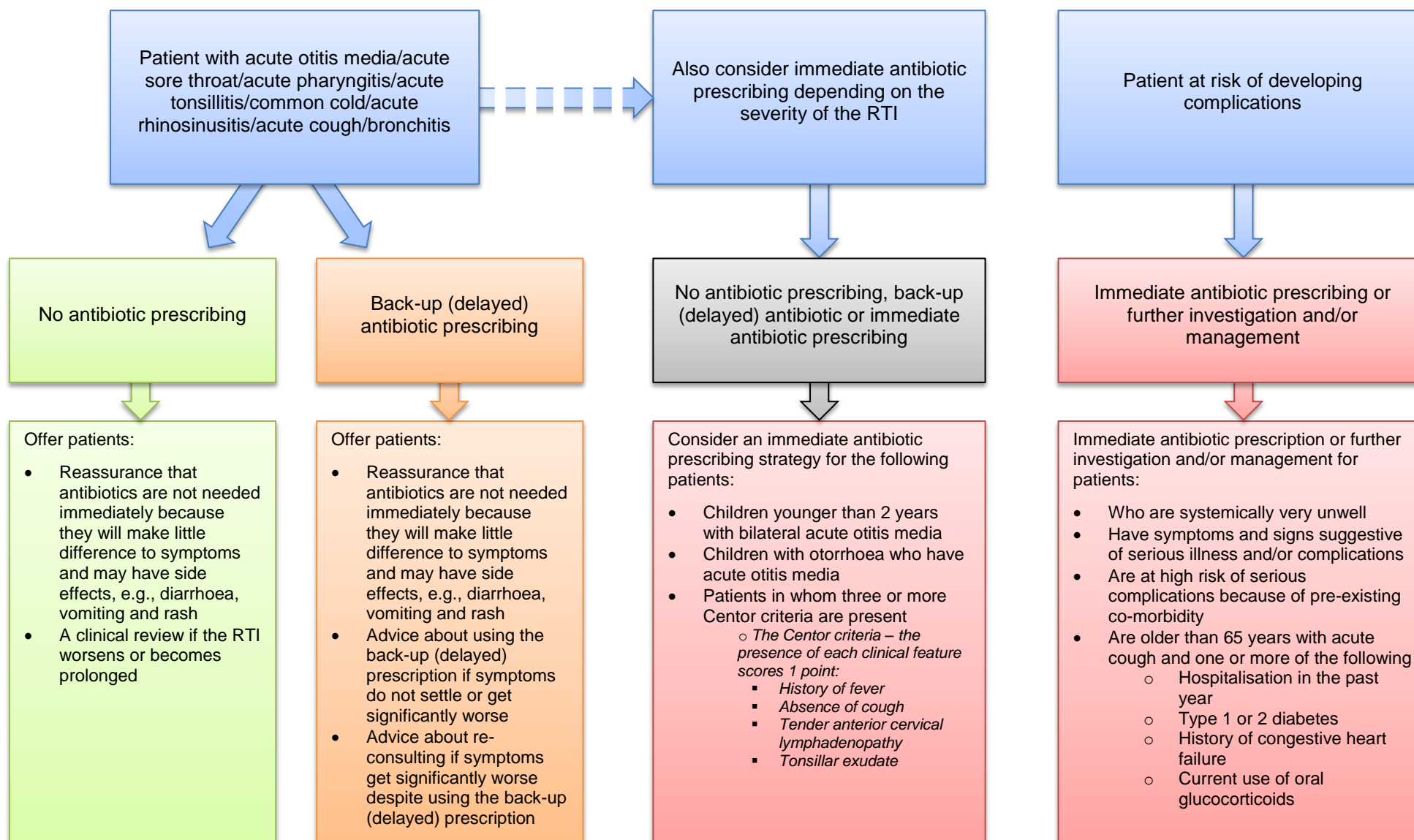
Scarborough Ryedale CCG

South Tees Hospitals NHS Foundation Trust

Vale of York CCG

York Teaching Hospitals NHS Foundation Trust

Appendix 1: 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](#)