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 Management of Infection for Primary Care guidelines.

Version 3 valid from January 2018. Review date January 2019 or sooner if new evidence available or national guidance published. Adapted locally for Sunderland and approved by the medicines optimisation and guidelines group.
North East and Cumbria antimicrobial prescribing guideline for primary care

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.
Principles of treatment

1. This guidance is based on the best available evidence, but use professional judgement and involve patients in management decisions.
2. This guidance should not be used in isolation; it should be supported with patient information about safety netting, delayed/back-up antibiotics, self-care, infection severity and usual duration, clinical staff education, and audits. Materials are available on the RCGP TARGET website.
3. Prescribe an antibiotic only when there is likely to be clear clinical benefit, giving alternative, non-antibiotic self-care advice, where appropriate.
4. Consider a ‘no’ or ‘delayed/back-up’ antibiotic strategy for acute self-limiting upper respiratory tract infections and mild UTI symptoms.
5. In severe infection, or immunocompromised, it is important to initiate antibiotics as soon as possible, particularly if sepsis is suspected. If patient is not at moderate to high risk for sepsis, give information about symptom monitoring, and how to access medical care if they are concerned.
6. Where an empirical therapy has failed or special circumstances exist, microbiological advice can be obtained from local hospital trust microbiologists (see contact details below).
7. Limit prescribing over the telephone to exceptional cases.
8. Use simple, generic antibiotics if possible. Avoid broad spectrum antibiotics (eg co-amoxiclav, quinolones and cephalosporins) when narrow spectrum antibiotics remain effective, as they increase the risk of Clostridium difficile, MRSA and resistant UTIs.
9. Always check for antibiotic allergies. A dose and duration of treatment for adults is usually suggested, but may need modification for age, weight, renal function, or if immunocompromised. In severe or recurrent cases, consider a larger dose or longer course.
10. Child doses are provided when appropriate, and can be accessed through the © symbol.
11. Refer to the BNF for further dosing and interaction information (eg the interaction between macrolides and statins), and check for hypersensitivity.
12. Have a lower threshold for antibiotics in immunocompromised, or in those with multiple morbidities; consider culture/specimens, and seek advice.
13. Avoid widespread use of topical antibiotics, especially in those agents also available systemically; in most cases, topical use should be limited.
14. In pregnancy, take specimens to inform treatment. Where possible, avoid tetracyclines, aminoglycosides, quinolones, azithromycin (except in chlamydial infection), clarithromycin, and high dose metronidazole (2g stat), unless the benefits outweigh the risks. Penicillins, cephalosporins, and erythromycin are safe in pregnancy. Short-term use of nitrofurantoin is not expected to cause foetal problems (theoretical risk of neonatal haemolysis). Trimethoprim is also unlikely to cause problems unless poor dietary folate intake, or taking another folate antagonist.
15. This guidance is developed alongside the NHS England Antibiotic Quality Premium. The required performance in 2017/18 is: a 10% reduction (or greater) in the number of E. coli blood stream infections across the whole health economy; a 10% reduction (or greater) in the trimethoprim:nitrofurantoin prescribing ratio for UTI in primary care, and a 10% reduction (or greater) in the number of trimethoprim items prescribed to patients aged 70 years or greater; sustained reduction of inappropriate prescribing in primary care.

Microbiology contacts

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

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>City Hospitals Sunderland NHS Foundation Trust</td>
<td>0191 565 6256</td>
</tr>
<tr>
<td>County Durham and Darlington NHS Foundation Trust</td>
<td>0191 333 2333</td>
</tr>
<tr>
<td>Gateshead Health NHS Foundation Trust</td>
<td>0191 482 0000</td>
</tr>
<tr>
<td>Newcastle upon Tyne Hospitals NHS Foundation Trust</td>
<td>0191 233 6161</td>
</tr>
<tr>
<td>North Cumbria University Hospitals NHS Trust</td>
<td>01228 523444</td>
</tr>
<tr>
<td>North Tees and Hartlepool NHS Foundation Trust</td>
<td>01642 617617</td>
</tr>
<tr>
<td>Northumbria Healthcare NHS Foundation Trust</td>
<td>0344 811 8111</td>
</tr>
<tr>
<td>South Tees Hospitals NHS Foundation Trust</td>
<td>01642 850850</td>
</tr>
<tr>
<td>South Tyneside NHS Foundation Trust</td>
<td>0191 404 1000</td>
</tr>
<tr>
<td>University Hospitals of Morecambe Bay NHS Foundation Trust</td>
<td>01229 870870</td>
</tr>
</tbody>
</table>
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:**

<table>
<thead>
<tr>
<th>Infection</th>
<th>Average length of symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle-ear infection</td>
<td>4 days</td>
</tr>
<tr>
<td>Sore throat</td>
<td>7 days</td>
</tr>
<tr>
<td>Common cold</td>
<td>10 days</td>
</tr>
<tr>
<td>Sinusitis</td>
<td>18 days</td>
</tr>
<tr>
<td>Cough or bronchitis</td>
<td>21 days</td>
</tr>
</tbody>
</table>

### **TREATMENT**

#### **ILLNESS**

<table>
<thead>
<tr>
<th>Infection</th>
<th>GOOD PRACTICE POINTS</th>
<th>TREATMENT</th>
<th>ADULT DOSE (click on © for child doses)</th>
<th>DURATION OF TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td>Annual vaccination is essential for all those “at risk” of influenza. Antivirals are not recommended for healthy adults.</td>
<td>Fever pain 0-1: self-care</td>
<td>500mg QDS (if severe) © 1g BD (less severe)</td>
<td>5-10 days</td>
</tr>
<tr>
<td>PHE Influenza</td>
<td>Treat “at risk” patients with five days oseltamivir 75mg BD, when influenza is circulating in the community, and ideally within 48 hours of onset (36 hours for zanamivir treatment in children), or in a care home where influenza is likely. At risk: pregnant (including up to two weeks post-partum); children under six months; adults 65 years or older; chronic respiratory disease (including COPD and asthma); significant cardiovascular disease (not hypertension); severe immunosuppression; diabetes mellitus; chronic neurological, renal or liver disease; morbid obesity (BMI&gt;40). See the PHE Influenza guidance for the treatment of patients under 13 years of age. In severe immunosuppression, or oseltamivir resistance, use zanamivir 10mg BD (two inhalations by diskhaler for up to 10 days) and seek advice.</td>
<td>First line (mild): analgesia</td>
<td>500mg QDS ©</td>
<td>7 days</td>
</tr>
<tr>
<td>Influenza prophylaxis</td>
<td>NICE Influenza</td>
<td>Penicillin allergy: clarithromycin</td>
<td>250mg BD © 500mg BD ©</td>
<td>5 days</td>
</tr>
<tr>
<td>NICE Influenza</td>
<td><strong>Acute sore throat</strong> <strong>NICE RTIs</strong>  © <strong>FeverPAIN</strong></td>
<td>Penicillin allergy in pregnancy: erythromycin</td>
<td>250-500mg QDS ©</td>
<td>5 days</td>
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<tr>
<td></td>
<td><strong>Avoid antibiotics as 82% of cases resolve in 7 days, and pain is only reduced by 16 hours.</strong></td>
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<tr>
<td></td>
<td><strong>Use FeverPAIN Score:_________________________________________________________________________</strong></td>
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<tr>
<td></td>
<td>Fever in last 24 hours: Purulence: Attend rapidly under three days: severely Inflamed tonsils: No cough or coryza. Score 0-1: 13-18% streptococci - no antibiotic. 2-3: 34-40% streptococci - 3 day delayed antibiotic. 4-5: 62-65% streptococci - if severe, immediate antibiotic or 48-hour delayed antibiotic.</td>
<td>First line (mild): analgesia</td>
<td>500mg QDS ©</td>
<td>5-10 days</td>
</tr>
<tr>
<td></td>
<td><strong>Advise paracetamol, self-care, and safety net. Complications are rare: antibiotics to prevent quinsy NNT=4000; otitis media NNT200. 10 days penicillin has lower relapse than five days in patients under 18 years of age.</strong></td>
<td>Penicillin allergy: clarithromycin</td>
<td>250mg BD © 500mg BD ©</td>
<td>5 days</td>
</tr>
<tr>
<td>Scarlet fever (GAS)</td>
<td><strong>PHE Scarlet fever</strong></td>
<td>Penicillin allergy in pregnancy: erythromycin</td>
<td>250-500mg QDS ©</td>
<td>5 days</td>
</tr>
<tr>
<td>PHE Scarlet fever</td>
<td><strong>Prompt treatment with appropriate antibiotics significantly reduces the risk of complications. Observe immunocompromised individuals (diabetes; women in the puerperal period; chickenpox) as they are at increased risk of developing invasive infection.</strong></td>
<td>First line (mild): analgesia</td>
<td>500mg QDS ©</td>
<td>10 days</td>
</tr>
<tr>
<td></td>
<td><strong>Phenoxymethylpenicillin</strong></td>
<td>Penicillin allergy: clarithromycin</td>
<td>250-500mg BD ©</td>
<td>5 days</td>
</tr>
<tr>
<td>Acute otitis media</td>
<td><strong>NICE RTIs</strong></td>
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<td></td>
<td></td>
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<tr>
<td><em>(child doses)</em></td>
<td><strong>Optimise analgesia and target antibiotics. AOM resolves in 60% of cases in 24 hours without antibiotics Antibiotics reduce pain only at two days (NNT15), and do not prevent deafness.</strong></td>
<td>First line (mild): analgesia</td>
<td>500mg QDS ©</td>
<td>5 days</td>
</tr>
<tr>
<td><em>(child doses)</em></td>
<td><strong>Consider 2 or 3 day delayed, or immediate antibiotics for pain relief If: &lt;2 years AND bilateral AOM (NNT4), bulging membrane, or</strong></td>
<td>Penicillin allergy: clarithromycin</td>
<td>250-500mg QDS ©</td>
<td>5 days</td>
</tr>
</tbody>
</table>

### Acute otitis externa

**CKS Otitis externa**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Score</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>8</td>
<td>Antibiotics to prevent mastoiditis NNT&gt;4000.</td>
</tr>
<tr>
<td>Tugging ears</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crying</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irritability</td>
<td></td>
<td></td>
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<tr>
<td>Difficulty sleeping</td>
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<tr>
<td>Less playful</td>
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<tr>
<td>Eating less</td>
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</tbody>
</table>

All ages with otorrhoea NNT3.

**Antibiotics to prevent mastoiditis NNT>4000.**

- **OR** clarithromycin
- **1 month-11 years:** 7.5mg/kg-250mg BD (weight dosing)
- **12-18 years:** 250mg BD

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Score</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tugging ears</td>
<td></td>
<td>Antimicrobial prophylaxis with <strong>clarithromycin</strong> in children up to 11 years and in children aged 12 and over.</td>
</tr>
<tr>
<td>Crying</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irritability</td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Eating less</td>
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</tr>
</tbody>
</table>

### Sinusitis (acute)

This guidance summarises the NICE Sinusitis (acute) guidance published in July 2017, and the NICE RTIs guidance published in July 2008.

**Symptoms <10 days:** do not offer antibiotics as most resolve in 14 days without, and antibiotics only offer marginal benefit after 7 days (NNT15).

**Symptoms >10 days:** no antibiotic, or back-up antibiotic if several of: purulent nasal discharge; severe localised unilateral pain; fever; marked deterioration after initial milder phase.

**Systemically very unwell, or more serious signs and symptoms:** immediate antibiotic.

**Suspected complications:** eg sepsis, intraorbital or intracranial, refer to secondary care.

**Self-care:** paracetamol/ibuprofen for pain/fever. Consider high-dose nasal steroid if >12 years. Nasal decongestants or saline may help some.

**No antibiotics:** self-care

**First line for delayed:** phenoxymethylpenicillin

**Penicillin allergy or intolerance:** doxycycline or clarithromycin

**Very unwell or worsening:** co-amoxiclav

**Suspected complications:** eg sepsis, intraorbital or intracranial, refer to secondary care.

**Self-care:** paracetamol/ibuprofen for pain/fever. Consider high-dose nasal steroid if >12 years. Nasal decongestants or saline may help some.

**No antibiotics:** self-care

**First line for delayed:** phenoxymethylpenicillin

**Penicillin allergy or intolerance:** doxycycline or clarithromycin

**Very unwell or worsening:** co-amoxiclav

**Suspected complications:** eg sepsis, intraorbital or intracranial, refer to secondary care.

**Self-care:** paracetamol/ibuprofen for pain/fever. Consider high-dose nasal steroid if >12 years. Nasal decongestants or saline may help some.

**No antibiotics:** self-care
Lower respiratory tract infections

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

**Do not** use quinolones (ciprofloxacin, ofloxacin) first line as there is poor pneumococcal activity. Reserve all quinolones (including levofloxacin) for proven resistant organisms.

<table>
<thead>
<tr>
<th>ILLNESS</th>
<th>GOOD PRACTICE POINTS</th>
<th>TREATMENT</th>
<th>ADULT DOSE (click on ☺ for child doses)</th>
<th>DURATION OF TREATMENT</th>
</tr>
</thead>
</table>
| Acute cough & bronchitis NICE RTIs   | **Antibiotics have little benefit if no co-morbidity.**  
**Second line:** 7 day delayed antibiotic, safety net, and advise that symptoms can last 3 weeks.  
**Consider immediate** antibiotics if >80 years of age and one of: hospitalisation in past year; taking oral steroids; insulin-dependent diabetic; congestive heart failure; serious neurological disorder/stroke, or >65 years with two of the above.  
**Consider CRP** if antibiotic is being considered.  
No antibiotics if CRP<20mg/L and symptoms for >24 hours; delayed antibiotics if 20-100mg/L; immediate antibiotics if >100mg/L.                                                                                                                                                                                                                           |  
**First line:** self-care and safety netting advice  
**Second line:** amoxicillin  
**Penicillin allergy:** doxycycline  
200mg stat then 100mg OD                                                                                                                                       |  
|                                                                                                                                       |                                                                                                                                             | 500mg TDS ☺                                                                                                                                  | 5 days                                                                                   |                                |
| Acute exacerbation of COPD NICE COPD GOLD COPD | **Treat with antibiotics if purulent sputum and increased shortness of breath and/or increased sputum volume.**  
Risk factors for antibiotic resistance: severe COPD (MRC>3); co-morbidity; frequent exacerbations; antibiotics in the last 3 months.                                                                                                                                                                                                                      |  
**amoxicillin**  
**OR doxycycline**  
**OR clarithromycin**  
**If at risk of resistance:** doxycycline  
200mg stat then 100mg OD                                                                                                                                         |  
|                                                                                                                                       |                                                                                                                                             | 500mg TDS ☺                                                                                                                                  | 5 days                                                                                   |                                |
|                                                                                                                                       |                                                                                                                                             | 200mg stat then 100mg OD                                                                                                                     | 5 days                                                                                   |                                |
|                                                                                                                                       |                                                                                                                                             | 500mg BD ☺                                                                                                                                   | 5 days                                                                                   |                                |
|                                                                                                                                       |                                                                                                                                             | 500/125mg TDS ☺                                                                                                                                | 5 days                                                                                   |                                |
| Community-acquired pneumonia NICE Pneumonia                                              | **Use CRB65 score to guide mortality risk, place of care, and antibiotics. Each CRB65 parameter scores one:**  
Confusion (AMT<8 or new disorientation in person, place or time);  
Respiratory rate <30/min;  
BP systolic <90, or diastolic ≤50;  
Age ≥65.  
**Score 0:** low risk, consider home-based care;  
1-2: intermediate risk, consider hospital assessment;  
3-4: urgent hospital admission.  
**Give safety-net advice** and likely duration of different symptoms, eg cough 6 weeks.  
Mycoplasma infection is rare in over 65s.  
**CRB65= 0:**  
**amoxicillin**  
**OR clarithromycin**  
**OR doxycycline**  
**CRB65= 1-2 and at home** (clinically assess need for dual therapy for atypicals)  
**amoxicillin AND clarithromycin**  
**OR doxycycline alone**  
500mg TDS  
500mg BD  
200mg stat then 100mg OD                                                                                                                                       |  
|                                                                                                                                       |                                                                                                                                             | 500mg TDS ☺                                                                                                                                  | 5 days; review at 3 days; 7-10 if poor response |                                |
|                                                                                                                                       |                                                                                                                                             | 500mg BD ☺                                                                                                                                  |                                |                                |
|                                                                                                                                       |                                                                                                                                             | 200mg stat then 100mg OD                                                                                                                     | 7-10 days                                                                            |                                |
Urinary tract infections

Note: As antibiotic resistance and Escherichia coli bacteraemia in the community is increasing, use nitrofurantoin first line, always give safety net and self-care advice, and consider risks for resistance.

Give TARGET UTI leaflet, and refer to the PHE UTI guidance for diagnostic information.

Do not routinely dipstick to exclude UTI. In elderly patients (>65 years), diagnosis should be based on 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.

<table>
<thead>
<tr>
<th>ILLNESS</th>
<th>GOOD PRACTICE POINTS</th>
<th>TREATMENT</th>
<th>ADULT DOSE (click on § for child doses)</th>
<th>DURATION OF TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTI in adults (lower) PHE UTI Diagnosis</td>
<td>All patients first line antibiotic: nitrofurantoin if GFR &gt;45mls/min. If GFR 30-45, only use if no alternative. Treat women with severe/23 symptoms.</td>
<td>First line: nitrofurantoin (if fever, use alternative) 100mg m/r BD, OR 50mg i/r QDS (BD dose increases compliance) If low risk of resistance: trimethoprim 200mg BD</td>
<td>Women: 3 days Men: 7 days</td>
<td></td>
</tr>
<tr>
<td>TARGET UTI</td>
<td>Women &lt;65 years (mild/52 symptoms): pain relief, and consider delayed antibiotic. If urine not cloudy, 97% NPV if no UTI.</td>
<td>If first line unsuitable: pivmecillinam 400mg stat then 200mg TDS (400mg if high resistance risk) If organism susceptible: amoxicillin 500mg TDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RCGP UTI</td>
<td>If urine cloudy, use dipstick to guide treatment: nitrite, leukocytes, blood all negative 76% NPV; nitrite plus blood or leukocytes 92% PPV of UTI.</td>
<td>If high resistance risk: fosfomycin Women and men: 3g stat Men: a second 3g stat on day 3 (unlicensed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIGN UTI</td>
<td>Men &lt;65 years: consider prostatitis and send MSU, or if symptoms mild or non-specific, use negative dipstick to exclude UTI.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NHS Scotland UTI</td>
<td>&gt;65 years: treat if fever &gt;38°C, or 1.5°C above base twice in 12 hours, and &gt;1 other symptom. If treatment failure: always perform culture.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UTI in patients with catheters: antibiotics will not eradicate asymptomatic bacteriuria; only treat if systemically unwell or pyelonephritis likely. Do not use prophylactic antibiotics for catheter change unless there is a history of catheter-change-associated UTI or trauma.</td>
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<tr>
<td></td>
<td>Take sample if new onset of delirium, or one or more symptoms of UTI.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>UTI in pregnancy SIGN UTI</td>
<td>Send MSU for culture; start antibiotics in all with significant positive culture, even if asymptomatic. First line: nitrofurantoin, unless at term. Second line: trimethoprim; avoid if low folate status, or on folate antagonist. Third line: cefalexin plus blood or leukocytes 92% PPV of UTI.</td>
<td>First line: nitrofurantoin (avoid at term) 100mg m/r BD OR 50mg i/r QDS Second line: trimethoprim (give folate if first trimester) 200mg BD (off-label) Third line: cefalexin 500mg BD</td>
<td>7 days</td>
<td></td>
</tr>
<tr>
<td>Acute prostatitis</td>
<td>Send MSU for culture and start antibiotics. 4 week course may prevent chronic prostatitis. Quinolones achieve high prostate concentrations.</td>
<td>Ciprofloxacin OR ofloxacin 500mg BD OR trimethoprim 200mg BD</td>
<td>28 days</td>
<td></td>
</tr>
<tr>
<td>UUT in children NICE UTI in under 16s</td>
<td>Child &lt;3 months: refer urgently for assessment. Child ≥3 months: use positive nitrite to guide antibiotic use; send pre-treatment MSU. Imaging: refer if child &lt;6 months, or recurrent or atypical UTI.</td>
<td>Lower UTI: nitrofurantoin OR trimethoprim * Second line: cefalexin If organism susceptible: amoxicillin</td>
<td>3 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Upper UTI: refer to paediatrics to: obtain a urine sample for culture; assess for signs of systemic infection; consider systemic antimicrobials.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute pyelonephritis</td>
<td>If admission not needed, send MSU for culture and susceptibility testing, and start antibiotics. If no response within 24 hours, seek advice. If ESBL risk, and on advice from a microbiologist, consider IV antibiotic via OPAT.</td>
<td>Ciprofloxacin OR co-amoxiclav 500/125mg TDS</td>
<td>7 days 7 days</td>
<td></td>
</tr>
<tr>
<td>Recurrent UTI in non-pregnant women (2 in 6 months or ≥3 in a year) TARGET UTI</td>
<td>First line: advise simple measures, including hydration; ibuprofen for symptom relief. Cranberry products work for some women. Second line: stand-by or post-coital antibiotics. Third line: antibiotic prophylaxis. Consider methenamine if renal/hepatic impairment.</td>
<td>Antibiotic prophylaxis: First line: nitrofurantoin 1000mg m/r At night or post-coital stat (off-label) Second line: ciprofloxacin 500mg If recent culture sensitive: trimethoprim 100mg</td>
<td>3-6 months, then review recurrence rate and need</td>
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<tr>
<td></td>
<td></td>
<td>Methenamine hippurate 1g BD</td>
<td>6 months</td>
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</tr>
</tbody>
</table>
## Gastrointestinal tract infections

### Oral candidiasis

**CKS Candida**  
**GOOD PRACTICE POINTS**  
*Topical azoles are more effective than topical nystatin. Oral candidiasis is rare in immunocompetent adults; consider undiagnosed risk factors, including HIV. Use 50mg fluconazole if extensive/severe candidiasis; if HIV or immunocompromised, use 100mg fluconazole.*

**TREATMENT**  
- **Miconazole oral gel**  
  - 2.5ml of 24mg/ml QDS (hold in mouth after food)
  - 7 days;
- **Fluconazole capsules**  
  - 50mg/100mg OD
  - 7-14 days

**ADULT DOSE (click on ☐ for child doses)**

**DURATION OF TREATMENT**

### Helicobacter pylori

**NICE GORD and dyspepsia**  
**GOOD PRACTICE POINTS**  
*Treat all positives, if known DU, GU, or low grade MALToma. NNT in non-ulcer dyspepsia: 14 Do not offer eradication for GORD. Do not use clarithromycin, metronidazole or quinolone if used in the past year for any infection. Penicillin allergy: use PPI PLUS clarithromycin PLUS metronidazole. If previous clarithromycin, use PPI PLUS bismuth salt PLUS metronidazole PLUS tetracycline hydrochloride. Relapse and previous metronidazole and clarithromycin: use PPI PLUS amoxicillin PLUS either tetracycline OR levofloxacin. Retest for H. pylori: post DU/GU, or relapse after second line therapy, using UBT or SAT, consider referral for endoscopy and culture.*

**TREATMENT**  
- **PPI**  
- **PLUS amoxicillin**  
  - 1g BD
- **PLUS clarithromycin**  
  - 500mg BD
- **OR metronidazole**  
  - 400mg BD
- **Penicillin allergy & previous clarithromycin:**  
  - **PPI WITH bismuth subsalicylate**  
    - 525mg QDS
  - **PLUS metronidazole**  
    - 400mg BD
  - **PLUS tetracycline hydrochloride**  
    - 500mg QDS
- **Relapse:**  
  - **PPI**
  - **PLUS amoxicillin**  
    - 1g BD
  - **PLUS tetracycline hydrochloride**  
    - 500mg QDS
  - **OR levofloxacin**  
    - 250mg BD
- **Third line on advice:**  
  - 14 days PPI PLUS bismuth salt PLUS two antibiotics not previously used, or rifabutin 150mg BD, or furazolidone 200mg BD.

### Infectious diarrhoea

**PHE Diarrhoea**  
**GOOD PRACTICE POINTS**  
*Refer previously healthy children with acute painful or bloody diarrhoea, to exclude E. coli 0157 infection. Antibiotic therapy is not usually indicated unless patient is systemically unwell. If systemically unwell and campylobacter suspected (eg undercooked meat and abdominal pain), consider clarithromycin 250-500mg BD for 5-7 days, if treated early (within 3 days).*

**TREATMENT**  
- **First episode:**  
  - **metronidazole**  
    - 400mg TDS
  - **Severe/type 027/recurrent:**  
    - **oral vancomycin**  
      - 125mg QDS
    - **Recurrent or second line:**  
      - **fidaxomycin**  
        - 200mg BD
- **Prophylaxis/treatment:**  
  - **bismuth subsalicylate**  
    - 2 tablets QDS
  - **azithromycin**  
    - 500mg OD

**ADULT DOSE (click on ☐ for child doses)**

**DURATION OF TREATMENT**

### Clostridium difficile

**PHE Clostridium difficile**  
**GOOD PRACTICE POINTS**  
*Stop unecessary antibiotics, PPIs, and antiperistaltic agents. Mild cases (<4 episodes of diarrhoea/day) may respond without metronidazole; 70% respond to metronidazole in 5 days;92% respond to metronidazole in 14 days. If severe (T>38.5, or WCC>15, rising creatinine, or signs/symptoms of severe colitis); treat with oral vancomycin, review progress closely, and consider hospital referral.*

**TREATMENT**  
- **First episode:**  
  - **metronidazole**  
    - 400mg TDS
  - **Severe/type 027/recurrent:**  
    - **oral vancomycin**  
      - 125mg QDS
    - **Recurrent or second line:**  
      - **fidaxomycin**  
        - 200mg BD
- **Prophylaxis/treatment:**  
  - **bismuth subsalicylate**  
    - 2 tablets QDS
  - **azithromycin**  
    - 500mg OD

**ADULT DOSE (click on ☐ for child doses)**

**DURATION OF TREATMENT**

### Traveller’s diarrhoea

**GOOD PRACTICE POINTS**  
*Prophylaxis rarely, if ever, indicated. Consider stand-by antimicrobial only for patients at high risk of severe illness, or visiting high risk areas.*

**TREATMENT**  
- **First episode:**  
  - **metronidazole**  
    - 400mg TDS
  - **Severe/type 027/recurrent:**  
    - **oral vancomycin**  
      - 125mg QDS
    - **Recurrent or second line:**  
      - **fidaxomycin**  
        - 200mg BD
- **Prophylaxis/treatment:**  
  - **bismuth subsalicylate**  
    - 2 tablets QDS
  - **azithromycin**  
    - 500mg OD

**ADULT DOSE (click on ☐ for child doses)**

**DURATION OF TREATMENT**

### Threadworm CKS Threadworm

**GOOD PRACTICE POINTS**  
*Treat all household contacts at the same time. Advise hygiene measures for two weeks (hand hygiene; pants at night; morning shower, including perianal area). Wash sleepwear, bed linen, and dust and vacuum. Child >6 months, add perianal wet wiping or washes three hourly.*

**TREATMENT**  
- **Child >6 months:**  
  - **mebendazole**
- **Child <6 months or pregnancy (at least in 1st trimester):**  
  - **only hygiene measure for 6 weeks**  
  - 100mg stat

**ADULT DOSE (click on ☐ for child doses)**

**DURATION OF TREATMENT**
## Genital tract infections

<table>
<thead>
<tr>
<th>ILLNESS</th>
<th>GOOD PRACTICE POINTS</th>
<th>TREATMENT</th>
<th>ADULT DOSE (click on ☰ for child doses)</th>
<th>DURATION OF TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>STI screening</td>
<td>People with risk factors should be screened for chlamydia, gonorrhoea, HIV, and syphilis. Refer individual and partners to GUM. <strong>Risk factors:</strong> &lt;25 years; no condom use; recent/frequent change of partner; symptomatic partner; area of high HIV.</td>
<td><strong>First line:</strong> azithromycin 1g OR doxycycline 100mg BD OR erythromycin 1g OR amoxicillin 500mg TDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlamydia trachomatis/urethritis</td>
<td>Opportunistically screen all patients aged 16-24 years. Treat partners and refer to GUM. Repeat test for cure in all at three months. <strong>Pregnancy/breastfeeding:</strong> azithromycin is most effective. As lower cure rate in pregnancy, test for cure at least three weeks after end of treatment.</td>
<td><strong>First line:</strong> azithromycin 1g OR doxycycline 100mg BD OR erythromycin 1g OR amoxicillin 500mg TDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epididymitis</td>
<td>Usually due to Gram-negative enteric bacteria in men over 35 years with low risk of STI. If under 35 years or STI risk, refer to GUM.</td>
<td>Doxycycline 100mg BD OR ofloxacin 200mg BD OR ciprofloxacin 500mg BD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaginal candidiasis</td>
<td>All topical and oral azoles give over 70% cure. <strong>Pregnancy:</strong> avoid oral azoles, and use intravaginal treatment for 7 days. <strong>Recurrent (&gt;4 episodes per year):</strong> 150mg oral fluconazole every 72 hours for three doses induction, followed by one dose once a week for six months maintenance.</td>
<td>Clotrimazole 500mg pessary OR 5g 10% cream OR miconazole 100mg pessary OR oral fluconazole 150mg Recurrent: fluconazole (induction/maintenance) 150mg every 72 hours THEN 150mg once a week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bacterial vaginosis</td>
<td><strong>Pregnancy:</strong> avoid oral azoles, and use intravaginal treatment for 7 days. <strong>Recurrent:</strong> self-care if mild, or immediate short course antiviral treatment, or suppressive therapy if more than six episodes per year.</td>
<td>Oral metronidazole 400mg BD OR metronidazole 0.75% vaginal gel OR clindamycin 2% cream OR metronidazole 0.75% vaginal gel OR clindamycin 2% cream</td>
<td>5-7 days Stat 5 nights Stat 5 nights 6 months</td>
<td></td>
</tr>
<tr>
<td>Genital herpes</td>
<td><strong>Advise:</strong> saline bathing, analgesia, or topical lidocaine for pain, and discuss transmission. <strong>First episode:</strong> treat within five days if new lesions or systemic symptoms, and refer to GUM. <strong>Recurrent:</strong> self-care if mild, or immediate short course antiviral treatment, or suppressive therapy if more than six episodes per year.</td>
<td><strong>First line:</strong> oral aciclovir 400mg TDS OR valaciclovir 500mg BD OR famciclovir 250mg TDS</td>
<td>5 days 2 days 5 days 1 day</td>
<td></td>
</tr>
<tr>
<td>Gonorrhoea</td>
<td>Antibiotic resistance is now very high. Use IM ceftriaxone and oral azithromycin; refer to GUM. <strong>Test of cure is essential.</strong></td>
<td>Ceftriaxone 500mg IM PLUS oral azithromycin 1g</td>
<td>Stat 5-7 days Stat</td>
<td></td>
</tr>
<tr>
<td>Trichomoniasis</td>
<td>Oral treatment needed as extravaginal infection common. Treat partners, and refer to GUM for other STIs. <strong>Pregnancy/breastfeeding:</strong> avoid 2g single dose metronidazole; clotrimazole for symptom relief (not cure) if metronidazole declined.</td>
<td>Metronidazole 400mg BD 2g (more adverse effects)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pelvic inflammatory disease</td>
<td>Refer women and sexual contacts to GUM. Always culture for gonorrhoea and chlamydia. If gonorrhoea likely (partner has it; sex abroad; severe symptoms), use regimen with ceftriaxone, as resistance to quinolones is high.</td>
<td>Metronidazole 400mg BD PLUS ofloxacin 400mg BD GC: metronidazole 400mg BD PLUS doxycycline 100mg BD PLUS ceftriaxone 500mg IM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ILLNESS</td>
<td>GOOD PRACTICE POINTS</td>
<td>TREATMENT</td>
<td>ADULT DOSE</td>
<td>DURATION OF TREATMENT</td>
</tr>
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<td>-------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
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<td>-----------------------</td>
</tr>
<tr>
<td>Impetigo</td>
<td>Reserve topical antibiotics for very localised lesions to reduce risk of bacteria becoming resistant. Only use mupirocin if caused by MRSA. Use topical undecenoates.</td>
<td>Topical fusidic acid</td>
<td>Thinly TDS</td>
<td>5 days</td>
</tr>
<tr>
<td>Bites: PHE Acne</td>
<td></td>
<td>MRSA: topical mupirocin</td>
<td>2% ointment TDS</td>
<td>5 days</td>
</tr>
<tr>
<td>PVL-SA</td>
<td></td>
<td>Oral fluconazollin</td>
<td>250-500mg QDS</td>
<td>7 days</td>
</tr>
<tr>
<td>Cold sores: CKS Cold sores</td>
<td>Most resolve after 5 days without treatment. Topical antivirals applied predominately. If frequent, severe, and predictable triggers: consider oral prophylaxis: aciclovir 400mg, twice daily, for 5-7 days.</td>
<td>Topical terbinafine</td>
<td>1% OD-DB</td>
<td>1-4 weeks</td>
</tr>
<tr>
<td>Scabies</td>
<td></td>
<td>Topical terbinafine</td>
<td>Thinly BD</td>
<td>5 days</td>
</tr>
<tr>
<td>Mastitis</td>
<td></td>
<td>Topical terbinafine</td>
<td>Thinly BD</td>
<td>5 days</td>
</tr>
<tr>
<td>Eczema</td>
<td>No visible signs of infection: antibiotic use (alone or with steroids) encourages resistance and does not improve healing. With visible signs of infection: use oral fluocoxacillin or clarithromycin, or topical treatment (as in impetigo).</td>
<td>Topical terbinafine</td>
<td>Thinly BD</td>
<td>5 days</td>
</tr>
<tr>
<td>Cellulitis and erysipelas</td>
<td>Class I: patient afebrile and healthy other than cellulitis, use oral fluocoxacillin alone. If river or sea water exposure: seek advice. Class II: patient febrile and ill, or comorbidity, admit for inavenous treatment, or use OPAT. Class III: if toxic appearance, admit.</td>
<td>Fluocoxacillin</td>
<td>500mg QDS</td>
<td>7 days; if slow response, continue for a further 7 days</td>
</tr>
<tr>
<td>Leg ulcer: PHE Venous leg ulcers</td>
<td>Ucers are always colonised. Antibiotics do not improve healing unless active infection (purulent exudate/odour; increased pain; cellulitis; pyrexia).</td>
<td>Fluocoxacillin</td>
<td>500mg QDS</td>
<td>As for cellulitis</td>
</tr>
<tr>
<td>Bites: CKS Bites</td>
<td></td>
<td>Prophylaxis/treatment all: co-amoxiclav</td>
<td>375-625mg TDS</td>
<td>7 days</td>
</tr>
<tr>
<td>Scabies: NHS Scabies</td>
<td>Treat whole body from ear/chin downwards, and under nails. Under 2 years/elderly: also treat face/scalp. Home/sexual contacts: treat within 24 hours.</td>
<td>Prophylaxis/treatment all: co-amoxiclav</td>
<td>375-625mg TDS</td>
<td>7 days</td>
</tr>
<tr>
<td>Mastitis</td>
<td>S. aureus is the most common infecting pathogen. Detect if woman has: a painful breast; fever and/or general malaise; a tender, red breast. Breastfeeding: oral antibiotics are appropriate, where indicated. Women should continue feeding, including from the affected breast.</td>
<td>Flucloxacin</td>
<td>500mg QDS</td>
<td>10-14 days</td>
</tr>
<tr>
<td>Scabies: NHS Scabies</td>
<td></td>
<td>Penicillin allergy: erythromycin</td>
<td>250-500mg QDS</td>
<td>7 days</td>
</tr>
<tr>
<td>Mastitis</td>
<td></td>
<td>Penicillin allergy: clarithromycin</td>
<td>250-500mg QDS</td>
<td>7 days</td>
</tr>
<tr>
<td>Mastitis</td>
<td></td>
<td>Animal penicillin allergy: metronidazole AND clarithromycin</td>
<td>400mg TDS</td>
<td>7 days</td>
</tr>
<tr>
<td>Mastitis</td>
<td></td>
<td>Animal penicillin allergy: metronidazole AND clarithromycin</td>
<td>250-500mg QDS</td>
<td>7 days</td>
</tr>
<tr>
<td>Dermatophyte infection: skin</td>
<td>Most cases: terbinafine is fungicidal; treatment time shorter than with fungistatic imidazoles. If candida possible, use imidazole.</td>
<td>Topical terbinafine 1% OD-DB</td>
<td>1% OD-DB</td>
<td>1-4 weeks</td>
</tr>
<tr>
<td>Dermatophyte infection: nail</td>
<td></td>
<td>OR topical imidazole 1% OD-DB</td>
<td>1% OD-DB</td>
<td>1-4 weeks</td>
</tr>
<tr>
<td>Bites: CKS Bites</td>
<td></td>
<td>For athlete’s foot: topical undecenoates (eg Mycostat)</td>
<td>OD-DB</td>
<td>4-6 weeks</td>
</tr>
<tr>
<td>Bites: CKS Bites</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bites: CKS Bites</td>
<td></td>
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</tbody>
</table>

**GOOD PRACTICE POINTS:**

- **Impetigo:** Reserve topical antibiotics for very localised lesions to reduce risk of bacteria becoming resistant. Only use mupirocin if caused by MRSA.
- **PVLS:** Panton-Valentine leukocidin (PVL) is a toxin produced by 20.8-46% of S. aureus from boils/abscesses. PVLS strains are rare in healthy people, but severe.
- **Suppressive therapy:** should only be started after primary infection has resolved, as ineffective if lesions are still leaking.
- **Risk factors for PVLS:** recurrent skin infections; invasive infections; MSM; if there is more than one case in a home or close community (school children; military personnel; nursing home residents; household contacts).
- **Acne:** Mild (open and closed comedones) or moderate (inflammatory lesions): First line: self-care (wash with mild soap; do not scrub; avoid make-up). Second line: topical retinoid or benzoyl peroxide. Third line: add topical antibiotic, or consider addition of oral antibiotic. Severe (nodules and cysts): add oral antibiotic (for 3 months max) and refer.
- **Cellulitis and erysipelas:** Class I: patient afebrile and healthy other than cellulitis, use oral fluocoxacillin alone. If river or sea water exposure: seek advice. Class II: patient febrile and ill, or comorbidity, admit for inavenous treatment, or use OPAT. Class III: if toxic appearance, admit. Erysipelas: often facial and unilateral. Use fluocoxacillin for non-facial erysipelas.
- **Leg ulcer:** Ucers are always colonised. Antibiotics do not improve healing unless active infection (purulent exudate/odour; increased pain; cellulitis; pyrexia).
- **Bites:** CKS Bites: S. aureus is the most common infecting pathogen. Detect if woman has: a painful breast; fever and/or general malaise; a tender, red breast. Breastfeeding: oral antibiotics are appropriate, where indicated. Women should continue feeding, including from the affected breast.

**TREATMENT:**

- **Impetigo:**
  - **First line:** self-care
  - **Second line:** topical retinoid
  - **Third line:** topical clindamycin
  - If treatment failure/severe:
    - Oral tetracycline
    - OR oral doxycycline
  - If infection confirmed:
    - If candida possible, use imidazole.
  - If infection confirmed:
    - Use fluocoxacillin for non-facial erysipelas.
- **Cellulitis and erysipelas:**
  - **Class I:** patient afebrile and healthy other than cellulitis, use oral fluocoxacillin alone. If river or sea water exposure: seek advice.
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**DURATION OF TREATMENT:**

- **Impetigo:** Thinly TDS
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- **Bites:** CKS Bites: S. aureus is the most common infecting pathogen. Detect if woman has: a painful breast; fever and/or general malaise; a tender, red breast. Breastfeeding: oral antibiotics are appropriate, where indicated. Women should continue feeding, including from the affected breast.
### Varicella zoster/ chickenpox
*PHE Varicella*

**Pregnant/immunocompromised/neonate:** seek urgent specialist advice.

**Chickenpox:** consider aciclovir if: onset of rash <24 hours, and one of the following: >14 years of age; severe pain; dense/oral rash; taking steroids; smoker.

**Shingles:** treat if >50 years (PHN rare if <50 years) and within 72 hours of rash, or if one of the following: active ophthalmic; Ramsey Hunt; eczema; non-truncal involvement; moderate or severe pain; moderate or severe rash.

**Shingles treatment if not within 72 hours:** consider starting antiviral drug up to one week after rash onset, if high risk of severe shingles or complications (continued vesicle formation; older age; immunocompromised; severe pain).

<table>
<thead>
<tr>
<th>Illness</th>
<th>Treatment</th>
<th>Adult Dose</th>
<th>Duration of Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aciclovir</td>
<td>800mg five times daily</td>
<td>7 days</td>
<td></td>
</tr>
<tr>
<td>Second line for shingles if poor compliance:</td>
<td>250-500mg TDS OR 750mg BD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valaciclovir</td>
<td>1g TDS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Herpes zoster/ shingles
*PCDS Herpes zoster*

**Chickenpox:** consider aciclovir if: onset of rash <24 hours, and one of the following: >14 years of age; severe pain; dense/oral rash; taking steroids; smoker.

**Shingles:** treat if >50 years (PHN rare if <50 years) and within 72 hours of rash, or if one of the following: active ophthalmic; Ramsey Hunt; eczema; non-truncal involvement; moderate or severe pain; moderate or severe rash.

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### Eye Infections

<table>
<thead>
<tr>
<th>Illness</th>
<th>Good Practice Points</th>
<th>Treatment</th>
<th>Adult Dose</th>
<th>Duration of Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conjunctivitis</strong></td>
<td><strong>AAO Conjunctivitis</strong></td>
<td><strong>First line:</strong> bath/clean eyelids with cotton wool dipped in sterile saline or boiled (cooled) water, to remove crusting. <strong>Treat only if severe,</strong> as most cases are viral or self-limiting. <strong>Bacterial conjunctivitis:</strong> usually unilateral and also self-limiting. It is characterised by red eye with mucopurulent, not watery discharge. 65% and 74% resolve on placebo by days 5 and 7. <strong>Second line:</strong> fusidic acid as it has less gram-negative activity.</td>
<td><strong>First line:</strong> self-care <strong>Second line:</strong> Chloramphenicol 0.5% eye drop OR 1% ointment</td>
<td>2 hourly for 2 days, then reduce frequency 3-4 times daily, or just at night if using eye drops</td>
</tr>
<tr>
<td><strong>Blepharitis</strong></td>
<td><strong>CKS Blepharitis</strong></td>
<td><strong>First line:</strong> lid hygiene for symptom control, including: warm compresses; lid massage and scrubs; gentle washing; avoiding cosmetics. <strong>Second line:</strong> topical antibiotics if hygiene measures are ineffective after 2 weeks. <strong>Signs of Meibomian gland dysfunction, or acne rosacea:</strong> consider oral antibiotics.</td>
<td><strong>First line:</strong> self-care <strong>Second line:</strong> Chloramphenicol 1% ointment BD</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Third line:</strong> oral oxytetracycline 500mg BD 250mg BD</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td><strong>OR oral doxycycline</strong> 100mg OD 50mg OD</td>
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</tr>
</tbody>
</table>
Suspected meningitis

Suspected meningococcal disease

NICE Meningitis

Transfer all patients to hospital immediately. If time before hospital admission, and non-blanching rash, give IV benzylpenicillin or IV cefotaxime. Do not give IV antibiotics if there is a definite history of anaphylaxis; rash is not a contraindication.

IV or IM benzylpenicillin OR IV or IM cefotaxime

Child <1 year: 300mg
Child 1-9 years: 600mg
Adult/child 10+ years: 1.2g
Child <12 years: 50mg/kg
Adult/child 12+ years: 1g

Stat dose; give IM, if vein cannot be accessed

Prevention of secondary case of meningitis: Only prescribe following advice from the Public Health England Health Protection Team:

North East: ☏ 0300 303 8596 (option 1)
Cumbria: ☏ 01228 606060

Suspected dental infections in primary care (outside dental setting)

Derived from the Scottish Dental Clinical Effectiveness Programme (SDCEP) 2013 Guidelines

This guidance is not designed to be a definitive guide to oral conditions, as GPs should not be involved in dental treatment. Patients presenting to non-dental primary care services with dental problems should be directed to their regular dentist, or if this is not possible, to the NHS 111 service (in England), who will be able to provided details of how to access emergency dental care.

Note: Antibiotics do not cure toothache. First line treatment is with paracetamol and/or ibuprofen; codeine is not effective for toothache.

<table>
<thead>
<tr>
<th>ILLNESS</th>
<th>GOOD PRACTICE POINTS</th>
<th>TREATMENT</th>
<th>ADULT DOSE</th>
<th>DURATION OF TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mucosal ulceration and inflammation (simple gingivitis) SDCEP Dental problems</td>
<td>Temporary pain and swelling relief can be attained with saline mouthwash. Use antiseptic mouthwash if more severe, and if pain limits oral hygiene to treat or prevent secondary infection. The primary cause for mucosal ulceration or inflammation (aphthous ulcers; oral lichen planus; herpes simplex infection; oral cancer) needs to be evaluated and treated.</td>
<td>Saline mouthwash</td>
<td>½ tsp salt in warm water</td>
<td>Always spit out after use</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chlorhexidine 0.12-0.2% (do not use within 30mins of toothpaste)</td>
<td>1 min BD with 10mL</td>
<td>Use until lesions resolve/less pain allows for oral hygiene</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hydrogen peroxide 6% (spit out after use)</td>
<td>2-3 mins BD-TDS with 15ml in ½ glass warm water</td>
<td></td>
</tr>
<tr>
<td>Acute necrotising ulcerative gingivitis</td>
<td>Refer to dentist for scaling and hygiene advice. Antiseptic mouthwash if pain limits oral hygiene. Commence metronidazole in the presence of systemic signs and symptoms.</td>
<td>Chlorhexidine 0.12-0.2% OR hydrogen peroxide 6%</td>
<td>See above dosing for mucosal ulceration</td>
<td>Until pain allows for oral hygiene</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Metronidazole</td>
<td>400mg TDS</td>
<td>3 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR amoxicillin</td>
<td>500mg TDS</td>
<td>3 days</td>
</tr>
<tr>
<td>Pericoronitis SDCEP Dental problems</td>
<td>Refer to dentist for irrigation and debridement. If persistent swelling or systemic symptoms, use metronidazole or amoxicillin. Use antiseptic mouthwash if pain and trismus limit oral hygiene.</td>
<td>Chlorhexidine 0.2% OR hydrogen peroxide 6%</td>
<td>See above dosing for mucosal ulceration</td>
<td>Until pain allows for oral hygiene</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Metronidazole</td>
<td>400mg TDS</td>
<td>3 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR amoxicillin</td>
<td>500mg TDS</td>
<td>3 days</td>
</tr>
<tr>
<td>Dental abscess SDCEP Dental problems</td>
<td>Regular analgesia should be the first option until a dentist can be seen for urgent drainage, as repeated courses of antibiotics for abscesses are not appropriate. Repeated antibiotics alone, without drainage, are ineffective in preventing the spread of infection. Antibiotics are only recommended if there are signs of severe infection, systemic symptoms, or a high risk of complications. Patients with severe odontogenic infections (cellulitis, plus signs of sepsis; difficulty in swallowing; impending airway obstruction) should be referred urgently for hospital admission to protect airway, for surgical drainage and for IV antibiotics. 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 there is no response to first line drugs.</td>
<td>If pus is present, refer for drainage, tooth extraction, or root canal. Send pus for investigation. If spreading infection (lymph node involvement or systemic signs, ie fever or malaise) ADD metronidazole. Use clarithromycin in true penicillin allergy and, if severe, refer to hospital.</td>
<td>Amoxicillin OR phenoxymethylpenicillin &amp; Metronidazole, if pus is present</td>
<td>Up to 5 days; review at 3 days</td>
</tr>
</tbody>
</table>

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 Tool**

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

2. **Perform a full set of observations. Are any 2 of the following present?**
   - Temperature: > 38°C or < 36°C
   - Respiratory rate: > 20 per minute
   - Heart rate: > 90 per minute
   - Acute confusion, disorientation, reduced conscious level
   - Consider blood glucose: > 7.7 relevant in non-diabetics

3. **Is any red flag present?**
   - Systolic BP < 90 mmHg
   - Heart rate > 130 per minute
   - Respiratory rate > 25 per minute
   - Oxygen saturation: < 91% (this be appropriate to accept 88% - 91% in patients with known COPD)

**Sepsis may be present**

Evaluate whether acute referral / admission required, especially if:
- already on antibiotics
- partially treated
- no clear source of infection
If treating in the community, consider:
- planned second assessment
- brief written handover documenting observations
- specific safety net advice

**Red Flag Sepsis**

This is a time critical condition, immediate action is required.

Dial 999

Arrange blue light transfer
Write a brief clear handover including observations and antibiotic allergies where present.

'Administer oxygen and other appropriate immediate care as available'

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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:

<table>
<thead>
<tr>
<th>High risk patient</th>
<th>High risk environment</th>
<th>High risk antibiotics (the 4Cs)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older patients &gt;65 years</td>
<td>Contact with <em>C. diff</em> patients</td>
<td>Clindamycin</td>
</tr>
<tr>
<td>Long term conditions requiring frequent antibiotics</td>
<td>Recent hospital admission</td>
<td>Ciprofloxacin and other quinolones</td>
</tr>
<tr>
<td>Recent antibiotic exposure within previous 2 months</td>
<td>Institutionalised</td>
<td>Cephalosporins</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Co-amoxiclav</td>
</tr>
</tbody>
</table>

**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* infection
- Co-administration of PPIs and antibiotic increases the risk of *C. diff* infection beyond that conferred by either treatment alone
- *C. diff* infection risk is increased after even short duration of PPI use

**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.

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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 therapy.

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

<table>
<thead>
<tr>
<th>Contra-indicated in penicillin allergy</th>
<th>Caution in penicillin allergy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amoxicillin</td>
<td>Avoid if serious type 1 penicillin allergy (e.g. anaphylaxis/angioedema)</td>
</tr>
<tr>
<td>Ampicillin</td>
<td>Use with caution if non-severe allergy (e.g. minor rash only)</td>
</tr>
<tr>
<td>Co-amoxiclav</td>
<td>• Cefaclor</td>
</tr>
<tr>
<td>Flucloxacin</td>
<td>• Cefalexin</td>
</tr>
<tr>
<td>Penicillin V</td>
<td>• Cefotaxime</td>
</tr>
<tr>
<td>Pivmecillinam</td>
<td>• Ceftriaxone</td>
</tr>
<tr>
<td></td>
<td>N.B. risk of allergic reaction is greater in β-lactams most similar to penicillins in underlying structure.</td>
</tr>
</tbody>
</table>

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

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.

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.

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 can be useful in visualising and explaining treatment effects and possible side effects to patients.

Cates 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/](http://www.nntonline.net/visualrx/examples/) to see more.

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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

<table>
<thead>
<tr>
<th>Educational Resource</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NECS Antimicrobial Stewardship eLearning</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Health Education England/ e-LFH Reducing Antimicrobial Resistance eLearning package</strong></td>
<td>As part of the 5 year antimicrobial resistance strategy, Health Education England have developed eLearning for all healthcare professionals. The updated Health &amp; 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.</td>
</tr>
<tr>
<td><strong>Future Learn Antimicrobial Stewardship: Managing Antibiotic Resistance</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>TARGET Antibiotic Resistance in Primary Care online course</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Skin Infections online course</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>MARTI Managing Acute Respiratory Tract Infections</strong></td>
<td>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 Cliodna McNulty and funded by an educational grant from the British Society for Antimicrobial Chemotherapy.</td>
</tr>
<tr>
<td><strong>Urinary Tract Infections</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>STAR Stemming the Tide of Antimicrobial Resistance</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>
Changes from version 2.2

This guideline is an update of the North East and Cumbria antibiotic prescribing guideline for primary care version 2.2, published in June 2016.
Acknowledgements

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NHS Newcastle Gateshead Clinical Commissioning Group
NHS North Cumbria 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