NHS
Great Yarmouth and Waveney
Clinical Commissioning Group

HealthEast

Great Yarmouth and Waveney area

Primary Care,
Community Services
and Out of Hours

# Antibiotic Formulary 2015/16

Revision date: Autumn 2016

**The broad spectrum quinolones, clindamycin, co-amoxiclav, second and third generation cephalosporins need to be restricted to reduce the incidence and virulence of clostridium difficile (C. diff) infection.**

**The elderly are prone to C. diff infection. Please risk assess and avoid antibiotics if possible.**

**MRSA is promoted by widespread antibiotic use.**

**Don't use flucloxacillin in patients with MRSA – it will be ineffective.**

**Use shorter courses and high doses wherever possible.**

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# Introduction

The Formulary is for use by NHS Great Yarmouth and Waveney CCG (HealthEast) GPs and non-medical prescribers and also for locally contracted community and out-of-hours services.

Recommendations are based on BNF Guidance and the Health Protection Agency primary care formulary. There are links to the Clinical Knowledge Summaries to guide diagnosis and management.

Local resistance patterns and the increasing incidence and virulence of MRSA and C. diff infection are taken into account. C. diff, is often resistant to quinolones – making quinolones more likely to precipitate C. diff infection which can be fatal.

ADULT treatment doses for patients with NORMAL RENAL AND HEPATIC FUNCTION are given. We generally recommend higher doses and shorter durations to improve compliance.

Administration is oral unless otherwise specified. If intravenous antibiotics are thought to be needed within community services, use the IV equivalent of the oral preparation or seek advice from the microbiologist.

Use the Summary of Product Characteristics for detailed information on each medicine.

Please annotate your formulary for personal use.

Please consider using it as a training aid for new prescribers and as the basis for a clinical meeting.

Electronic links to useful information are provided for patients and prescribers – see links on page six.

# Accessing and commenting on the formulary

The booklet and flashcard are available in hard copy and as digital PDFs. Visit: **http://nww.knowledgeanglia.nh.uk/prescribing_gyw/formularies.htm** Messages on ScrptSwitch will be used to support formulary choices.

Comments on this publication, reporting broken links and suggestions for future editions can be forwarded to Michael Dennis – **michael.dennis@nhs.net** or Tel: 01502 719511.

# Local contacts

For patient specific clinical questions please contact the Clinical Duty Microbiologist via JPUH switchboard – 01493 452 452.

For queries on H pylori eradication regimens and when to use them please contact Dr Matt Williams, Consultant Gastroenterologist at JPUHT on 01493 453 572.

For enquires relating to MRSA or C. diff infection and other multi-resistant organisms such as extended spectrum beta lactamase producers (ESBLs) and vancomycin resistant enterococci (VREs) – please contact the your local Infection and Prevention Control Team on 01502 719 534.

# Contributors

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## Resources

1. The BNF and BNF for children
   **https://www.medicinescomplete.com/mc/index.htm**

2. Electronic Medicines Compendium (Summaries of Product Characteristics – SmPC) – **http://www.medicines.org.uk/emc**

3. Patient friendly information leaflets. Probably the best readily available source is at www.patient.co.uk (linked with the clinical knowledge service) – more specifically try
   **http://www.patient.co.uk/pils.asp** (general leaflets)
   **http://www.patient.co.uk/display/16777232** (infection leaflets)

4. Health Protection Agency. Management of infection guidance for primary care **https://www.gov.uk/government/publications/managing-common-infections-guidance-for-primary-care**

5. This link takes you straight to a visual example of Numbers Needed to Treat and Numbers Needed Harm as a consequence of Treating acute otitis media with antibiotics.
   **http://www.nntonline.net/visualrx/examples**

6. The Clinical Knowledge Service has many useful algorithms for the treatment of common infections – see **http://cks.nice.org.uk**

7. Here you will find useful policies based on national information for assisting with infection control in areas such as MRSA, C. diff, notifiable diseases, catheter care and the like.
   **http://www.eastcoastch.co.uk/page.asp?fldArea=1&fldMenu=3&fldSubMenu=2&fldKey=152**

# Key clinical messages for prescribers

- Please use amoxicillin (not co-amoxiclav) first-line for chest infections. Streptococcus pneumoniae remains the most common respiratory pathogen in Great Yarmouth and Waveney. Locally, the great majority of isolates are susceptible to amoxicillin.

- Cephalosporins other than cefalexin and cefradine are no longer recommended.

- Quinolones are probably over prescribed. There is increasing resistance to quinolones. Locally, resistant C. diff strains are circulating in the community. There is now no place for the use of quinolones without first obtaining prior sensitivity results – please see details in prescribing dilemmas.

- Patients at high risk of contracting C. diff infection are:

  - Age >65 yrs, debilitated and immunocompromised.
  - Previous hospital / care home admission in last two months.
  - Previous antibiotic therapy in the last three months.
  - Previous history of C. diff infection.

  Please avoid quinolones, second and third generation cephalo sporins, clindamycin and co-amoxiclav in these patients if at all possible.

- In patients known to be MRSA positive please avoid antibiotics where possible. Don't prescribe flucloxacillin as it will be ineffective. Doxycycline remains an option. Where possible please swab prior to treatment.

# Educational messages – approaches for prescribers and patients

National comparisons show Gt Yarmouth and Waveney CCG remain low prescribers of broad spectrum agents and quinolones. However overall prescribing rates for self limiting conditions remain too high.

Antibiotic prescribing in self-limiting conditions has been shown to reinforce patient belief that antibiotics are highly beneficial and encourage future consultations and GP workload.

Educational messages have been shown to be effective in satisfying patient expectations. For example, research has shown that patients who receive a leaflet, as an alternative to a prescription, detailing the natural history of their illness were less likely to return to the surgery. Please use leaflets and explanations when you can.

Research has also shown that GPs think a patient "wants" an antibiotic 20% more often than the patient, when questioned, said they did!

Approaches and evidence to discuss with patients:

- For duration of common symptoms - see back cover.
- Half of all antibacterials prescribed in primary care are given for respiratory tract infections, a high proportion of which are viral.
- Serious complications (e.g. post-Streptococcal nephritis following throat infections) are very very rare in otherwise healthy individuals. The evidence to suggest that widespread use of antibiotics would reduce the frequency of such complications is weak and doesn't support widespread prescription.
- Offering delayed prescriptions to patients who request antibiotics for self-limiting conditions has reduced unnecessary antibiotic use. Patient expectations are fulfilled if leaflets are accompanied by an adequate explanation of the natural history of the condition – see back cover.

Types of delayed prescription:

1. Give the patient a prescription at first consultation and suggest they use it only if they don't improve in 24 to 48 hours. A stamp and ink pad are available for prescribers to stamp scripts – Please don't dispense before..... or after.....
2. Tell the patient a prescription will be left at reception within the next 24 to 48 hours and to collect it only if they remain unwell.
3. Ask the patient to return in 24 to 48 hours if they are no better.

## Methicillin Resistant Staphylococcus aureus (MRSA) – management in general practice

See ECCH Policy on managing patients colonised by or infected with MRSA. **http://www.eastcoastch.co.uk/page.asp?fldArea=1&fldMenu=3&fldSubMenu=2&fldKey=152**

Distinguish between colonisation and infection due to MRSA. Colonisation of a wound will not prevent healing and does not normally require systemic antibiotic therapy.

In hospital, attempts are made to eradicate colonisation in order to prevent spread to other patients; especially those with open wounds or invasive devices who could be at risk of serious infection.

Decolonisation may be undertaken in the community only after a risk assessment. Patients requiring decolonisation can include:

- patients awaiting hospital admission for certain surgical procedures such as hip replacement or cataract removal.
- previously unknown new MRSA patients with colonisation discovered post-discharge.

- there are now more systemic infections in vulnerable elderly patients in the community e.g. diabetics and the immunocompromised; on occasion decolonisation may be undertaken to prevent probable serious systemic infection.

## Decolonisation regimen:

**Octenidine (Octenisan®) Body Wash**

- Once a day for five days. Prescribe 500ml.
- Apply to wet skin and don't dilute the product beforehand.
- Use as liquid soap in bath or shower daily and as shampoo on days 1,3 and 5.
- Pay particular attention to armpits, navel, groin, under breasts, hands and buttocks.
- Leave in contact with the skin for 1 minute, wash off and dry skin well.

**Plus**

- Mupirocin 2% nasal ointment (Bactroban 3g), applied to the nostrils three times daily for five days.

**Or**

- Chlorhexidine hydrochloride 0.1% neomycin sulphate 0.5% 15g (Naseptin), applied to the nostrils three times daily for five days. Screening swabs should be taken at least two days after the end of the course. If the patient remains positive for MRSA please seek advice from the Duty Microbiologist or ECCH Infection and Prevention Control Team, prior to admission.

When there is clinical evidence of infection, antibiotic therapy may be indicated. Severe infections should be referred to hospital for intravenous antibiotics. However, it may be appropriate in some mild or moderate infections to consider using topical or oral antibiotics.

Although the great majority of MRSA strains currently prevalent are resistant to macrolides and fluoroquinolones as well as flucloxacillin, most remain susceptible to doxycycline.

Further advice on treatment of MRSA may be obtained from the Duty Microbiologist at JPUHT. Advice on infection control aspects in the community, including nursing homes, is available from ECCH Infection and Prevention Control Team.

See Policy for Caring for Patients with MRSA and patient information leaflets here: **http://www.eastcoastch.co.uk/page.asp?fldArea=1&fldMenu=3&fldSubMenu=2&fldKey=152**

## Clostridium difficile (C. diff)? What is it?

C. diff is a gram-positive, anaerobic bacterium. Some strains produce toxins (toxin positive C. diff) and all produce spores. The spores are resistant to heat and drying and make it difficult to control environmental spread. All C. diff strains can cause: loss of appetite, inflammation of the bowel lining, profuse foul smelling diarrhoea. Severe symptoms include pseudomembranous colitis, toxic mega-colon, perforation, sepsis and death.

The initial screening test for C. diff is based on glutamate dehydrogenase (GDH). GDH is present in all C. diff strains. So a positive GDH is indicative of C. diff being present. This may reflect colonisation or infection.

Toxin production is essential for C. diff infection. A second test for the presence of toxin is carried out on all GDH positive stool specimens:

- GDH NOT detected – No C. diff present.
- GDH DETECTED, toxin NOT detected – may represent colonisation rather than infection. Rule out other causes of diarrhoea. Discuss with Microbiology if there is on-going diarrhoea. If no other cause found, some of these patients may require treatment as for C. diff infection
- GDH DETECTED, Toxin DETECTED – patient has C. diff infection. Treat based on symptom severity

## How is it spread?

C. diff spores live in the environment for long periods. Contaminated surfaces e.g. equipment and furniture harbour spores. People become infected by touching contaminated surfaces and ingesting spores.

Bacteria also shed in the faeces and person-to-person spread occurs by the faecal-oral route.

## Why is C diff a problem?

- Increasing antibiotic use, stripping the bowel of its normal protective flora
- Increasing antibiotic resistance in C. diff
- Increased virulence of the organism
- Higher rate of toxin production
- Environmental contamination

# What can be done?

The Health Act code of practice requires Trusts to have a specific policy for C. diff management:

- Surveillance
- Diagnostic criteria
- Isolation / cohort nursing
- Environmental decontamination
- Antibiotic prescribing policies

Local cases are meticulously documented and followed up. Quinolone resistant C. diff cases are circulating within the Community – it is not just a "hospital problem." All antibiotics have been associated with cases of C. diff but there are some data to help rank the risk as summarised below:

| Relative Risk of Antibiotics and their association with CDI |
|---|
| **High risk antibiotics for CDI** |
| **Second generation cephalosporins** e.g. cefaclor and cefuroxime<br>**Third generation cephalosporins** e.g. cefixime, cefotaxime, ceftazidime and ceftriaxone<br>**Clindamycin**<br>**Co-amoxiclav**<br>**Quinolones** e.g. ciprofloxacin, levofloxacin, ofloxacin, norfloxacin |
| **Intermediate risk antibiotics for CDI** |
| **Macrolides** e.g. erythromycin and clarithromycin<br>**Aminopenicillins*** e.g. amoxicillin, ampicillin<br>*risk increases with prolonged courses |
| **Low risk antibiotics for CDI** |
| **Trimethoprim**<br>**Tetracyclines** e.g. tetracycline, oxytetracycline, doxycycline, minocycline<br>**Benzylpenicillin / Phenoxymethylpenicillin**<br>**Aminoglycosides** e.g. gentamicin<br>**Vancomycin**<br>**Piperacillin with tazobactam** |

# Risk factors for contracting C. diff infection (CDI) are:

- > age especially > 65 years
- Debilitated
- Immunocompromised
- Admission to hospital or care home in the previous two months
- Antibiotic therapy within the last two to three months (especially quinolones, co-amoxiclav, clindamycin and second and third generation cephalosporins)
- History of CDI.

N.B. Please avoid the use of any antibiotics in these patients if at all possible.

Treatment of confirmed cases of CDI will be directed by JPUHT microbiologist. Please avoid the use of all anti-diarrhoeals in these patients.

**Fidaxomicin**

An oral antibiotic reserved for the treatment of CDI. Restricted use – third or fourth CDI episode (i.e. 2nd or 3rd recurrence) where other antibiotics have failed. Prescribe only on the recommendation of a Consultant Microbiologist.

Note: 200mg bd for 10 days – cost circa £1200 per course.

See ECCH Policy and Precautions to be taken when caring for patients with C. diff: **http://www.eastcoastch.co.uk/page.asp?fldArea=1&fldMenu=3&fldSubMenu=2&fldKey=152**
Patient information leaflets can also be found here.

# Patient Clostridium difficile Management Flow Chart

**Notified of C. diff toxin positive sample**

**Contact patient ASAP**

1. Assess severity*
2. Stop precipitating antibiotics if possible
3. Stop/advise against antimotility drugs and proton pump inhibitors
4. Admission may be required if patient unwell/unable to cope at home
5. **Commence antibiotics for C. diff****
6. If this diagnosis is a relapse of a previously positive patient please contact the consultant microbiologist for advice via hospital switchboard

Patient information leaflets are available from all pharmacies in Great Yarmouth and Waveney (Supply information for root cause analysis to ECCH IPCT)

The ECCH IPCT will follow the patient until they are stable.
01502 719534
Give patient standard advice with regards to good hygiene and a bland diet stressing the importance of suitable and adequate fluids and bleach-based cleaning of the home and use of separate toilet where possible

ADVISE PATIENT TO CONTACT GP SURGERY
IF SYMPTOMS PERSIST AFTER 4 DAYS OF TREATMENT

STOOL SAMPLES FOR CLEARANCE **ARE NOT** REQUIRED
If symptoms return contact the ECCH IPCT or JPUH Consultant Microbiologist
01493 452452

*** Severity indicators:**

**for colitis/toxic megacolon:**

- Fever >38 Diarrhoea >5 times a day (not a reliable indicator)
- Abdominal tenderness/pain/ distension

**If available**

- Raised WBC>15,000

**** Antibiotics**

Commence oral
Metronidazole 400mgs TDS
for mild disease for 10 days
or
Vancomycin 125mg QDS
for 10 days for severe disease

# Antibiotic use in pregnancy

## Drugs in Pregnancy

| Drug | First trimester | Second trimester | Third trimester | Comment |
|---|---|---|---|---|
| Tetracyclines e.g. Doxycycline | No | No | No | Deposits in bone including and teeth. Maternal toxicity in high doses. |
| Nitrofurantoin | Yes | Yes | No | Neonatal haemolysis if used at term. |
| Trimethoprim | No | Yes | Yes | Folate antagonist – teratogenic risk. |
| Quinolones | No | No | No | Arthropathy in animal studies. May occasionally be needed on specialist advice. Safer alternatives usually available. |
| Metronidazole | Avoid short, high dose courses e.g. 2g stat | Avoid short, high dose courses e.g. 2g stat | Avoid short, high dose courses e.g. 2g stat | Short, high dose courses not recommended but no evidence of harm. |

# Antibiotic drug interactions with contraceptives

New advice has been issued. Except for antibiotics that are enzyme inducers i.e. rifampicin and rifabutin no additional contraceptive measures are usually needed unless there is diarrhoea or vomiting.

Note also that some anti-retroviral agents are also enzyme inducers and require additional precautions / changes in contraceptive method.

See **http://www.fsrh.org/pdfs/CEUGuidanceDrugInteractionsHormonal.pdf** or the BNF for further details.

# Penicillin allergy

1. Check the history, which is often inaccurate. Patients commonly report minor skin reactions and stomach upsets as penicillin allergy. There is no test for allergy; allergic or anaphylactic response is not dose related.
2. Cephalosporins should be used with caution in penicillin allergic patients. The quoted incidence of cross-reactions is between 0.5 to 6.5%.
3. Where there is a history of immediate hypersensitivity reactions i.e. anaphylaxis, angioneurotic oedema, urticaria – avoid penicillins and the cephalosporins.
4. Substitute drugs – see individual treatment tables.

# Common prescribing dilemmas

## 1. Oral cephalosporins

Their place in general practice can be summarised as follows.

The first generation cephalosporins – cefradine and cefalexin have some uses:

- Cefalexin or cefradine are alternatives to trimethoprim or nitrofurantoin in the management of UTIs. Rather than use them empirically we would prefer they are used according to sensitivity results.
  Note: for a first UTI sample cefalexin / cefradine sensitivities will only be reported IF one of amoxicillin, trimethoprim or nitrofurantoin is shown to be resistant.

- They are not suitable for the management of lower or upper respiratory tract infection.

- The oral broad-spectrum agents e.g. cefaclor, cefuroxime axetil and cefpodoxime are theoretical choices in the management of upper and lower respiratory tract infections and some cases of otitis media. However, they are cited as high risk for causing CDI – please avoid. They are not listed as a formulary choice and alternative treatments are available.

## 2. The macrolides

The macrolides have a similar (not identical) spectrum of activity to penicillin and are an alternative for penicillin allergic patients.

They are active against some penicillin-resistant staphylococci and are used to treat some skin infections. They are also active against many Streptococci e.g. Strep-induced sore throats.

### Clarithromycin or erythromycin?

Price differentials are now small when erythromycin is prescribed as the cost-effective base drug i.e. erythromycin e/c tablets. Other salts and capsules are expensive. Clarithromycin is an erythromycin derivative which may be slightly more active and have higher tissue concentrations than erythromycin.

Clarithromycin can be given twice daily as opposed to four times daily with erythromycin. Both medicines are poorly tolerated – the main side-effect being GI upset.

Clinical differences appear small and both erythromycin and clarithromycin are acceptable.

### Drug interactions

Case reports and studies on interactions are sometimes contradictory between different macrolides and advice to manage interactions is sometimes inconsistent.

If interactions are likely to be a problem then consider an alternative antibiotic within the recommendations.

N.B. Macrolides extend the cardiac QT interval and interact with a number of different medicines.

Co-prescription with drugs that extend QT interval or have cardiotoxic effects is contraindicated.

Prescribing macrolides with statins: Simvastatin should be stopped. Atorvastatin stopped or dose reduced to 20mg whilst on the macrolide. The Pravastatin SmPC recommends prescribing with caution as pravastatin levels change by less than other statins. Statins can be re-started after the course of the macrolide.

Prescription with coumarin anticoagulants e.g. warfarin: Reports and studies vary. Anticoagulant effect can be enhanced but it can be seven days or more until the INR increases. This delay makes the interaction difficult to manage. Recommendations vary between taking an immediate INR and then one seven days later or to take INR every two days until the end of the course.

If in doubt about interactions either use an alternative antibiotic or refer to more specialist drug interaction resources.

## 3. The fluoroquinolones

The established agents are:

- Norfloxacin
- Ofloxacin
- Ciprofloxacin
- Levofloxacin
- Moxifloxacin

Resistance to quinolones is increasing – almost all MRSA, locally, are resistant, as are some strains of C. diff circulating in the community.

Apart from the three exceptions below, quinolones should only be used where Pseudomonas has been identified and antibiotic sensitivities are available.

Exceptions, where sensitivities are unlikely to be available or delayed and / or patients with these conditions are unlikely to be at risk of CDI. These are:

1. Managing Pelvic Inflammatory Disease (PID).
2. Managing acute prostatitis and epididymo-orchitis.
3. Empirical treatment for acute pyelonephritis pending MSU result.

For PID, metronidazole and ofloxacin are recommended as a second-line choice. Most of these patients will be young and unlikely to develop C. diff infection.

For prostatitis or epididymo-orchitis, quinolones are reported to be marginally more effective but both trimethoprim and quinolones are options and trimethoprim will be effective in the majority of patients.

If considering a quinolone, please risk assess the patient for likelihood of precipitating C. diff infection. Treat for 28 days.

Quinolones should not be used for infections likely to be caused by Staphylococci such as skin or soft tissue infections.

## Safety

Of particular concern are tendonitis and tendon rupture which can occur within 48 hrs of starting therapy.

The interaction of ciprofloxacin and theophyllines is potentially life threatening.

The Medicines and Healthcare products Regulatory Agency (MHRA) has restricted the use of Moxifloxacin due to an increased incidence of liver reactions and other serious adverse effects. Its use in primary care is not recommended.

The MHRA has warned that quinolones may induce convulsions in patients with or without a history of convulsions; taking NSAIDs at the same time may also induce them. They should be used with caution in patients with a history of epilepsy or conditions that predispose to seizures.

Please avoid in patients at high risk of developing CDI.

Quinolones should not be used in pregnancy unless absolutely necessary.

There are often safer, more effective options than quinolones.

## 4. Co-amoxiclav

Co-amoxiclav is a broad spectrum antibiotic. A key indication remains immediate treatment of acute pyelonephritis prior to return of sensitivity results – please use co-amoxiclav not a quinolone.

Please avoid first-line use of co-amoxiclav for URTI and LRTI – use amoxicillin. An exception may be where aspiration pneumonia is suspected.

In general we feel co-amoxiclav is over prescribed and in this edition it has been removed from some indications.

# Safety

Due to six-fold increase in cholestatic jaundice when compared with amoxicillin the MHRA recommend ensuring that narrow spectrum agents are tried first-line and duration of co-amoxiclav is limited to 14 days.

Please risk assess patients for their chances of developing C. diff infection and avoid if at all possible.

## 5. Flucloxacillin

The MHRA has advised that flucloxacillin has, very rarely, caused cholestatic jaundice and hepatitis which has occurred several weeks after stopping therapy. Increased risk is incurred when courses exceed two weeks and in the elderly. Use with caution in patients with hepatic impairment.

Flucloxacillin is ineffective against MRSA infection.

# Better antibiotic prescribing

- Follow the formulary and use it as a training guide.
- Take pre-treatment samples and be guided by local sensitivity results. Use the duty microbiologist.
- Stop unnecessary antimicrobial use for self-limiting conditions e.g. viral upper respiratory tract infections.
- Use short courses e.g. simple UTIs.
- Avoid widespread use of broad-spectrum antibiotics e.g. ciprofloxacin and co-amoxiclav, to reduce risk of CDI.
- Avoid cephalosporins, other than cefradine and cefalexin for specific indications.
- Avoid repeat courses without microbiological confirmation – especially in the elderly.
- Avoid antibiotics in catheterised (usually elderly) patients, unless there is a severe deteriorating clinical picture. Microbiology will often be positive but this is not enough, of itself, to treat.

# Upper respiratory tract infections

| Treatment | 1st Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **Tonsillitis Strep Pyogenes** likely (sore throat)[1] | Penicillin V 500mg qds | Clarithromycin 500mg bd | |
| | **10 days** | **5 days** | |
| **Sinusitis** | No antibiotic | Amoxicillin 1g tds | Doxycycline 200mg stat then 100mg od with / or Clarithromycin 500mg bd |
| | | **7 days** | |
| **Normal non-pandemic circumstances**[2] Influenza **prophylaxis** in at risk groups[3] See current BNF | Oseltamivir 75mg oral capsule od | Zanamivir 10mg (2 inhalations by diskhaler) od | |
| | **10 days** | | |
| **Normal non-pandemic circumstances**[2] Influenza **treatment** in at risk groups[3] See current BNF | Oseltamivir 75mg oral capsule bd or Zanamivir 10mg (2 inhalations by diskhaler) bd | | |
| | **5 days** | | |

# Upper respiratory tract infections cont:

| Treatment | 〉 1st Choice | 〉 2nd Choice | 〉 3rd Choice |
|---|---|---|---|
| **Otitis externa**[4] Treatment Options: Mild | 2% acetic acid (Ear Calm) is available OTC (mildly anti-infective and antibacterial) use plus or minus corticosteroid drops in mild cases only | | |
| Moderate | Topical neomycin: Betnesol N drops | Polymyxin (colistin) = Otosporin drops | |
| | **7 days** | | |
| Cellulitis severe or patient systemically unwell | Flucloxacillin 1g qds | Clarithromycin 500mg qds | |
| | **7 days** | | |
| Probable fungal infection | Topical Clotrimazole 1% solution | | |
| | **4 weeks** | | |
| **Otitis media acute**[5] | No antibiotic | Amoxicillin 1-5 years 250mg tds. 5-18 years 500mg tds | Clarithromycin Dose: see SmPC |
| | | **5 days** | |
| **Otitis media with effusion** | 6-12 weeks watchful waiting. During this period do not prescribe antibiotics, steroids, antihistamines, decongestants, or mucolytics. See CKS for further managment. | | |

# Upper respiratory tract infections cont:

**Notes:**

1. Tonsillitis is commonly viral, most patients don't benefit from antibiotics. Normal duration is eight days; antibiotics shorten this by about eight hours. Try a strategy of delayed prescription if appropriate. Patients with 3 or 4 Centor criteria (fever, purulent tonsils, cervical adenopathy, and absence of cough) or history of otitis media may benefit more from antibiotics. You need to treat 30 children and 145 adults to prevent one case of otitis media.
2. This advice will be superseded in the event of a pandemic and when atypical strains or unusual patient groups are being adversely affected – specialist advice will be issued by the Department of Health.
3. For otherwise healthy adults, antivirals are not recommended. Treat 'at risk'patients, only when influenza is circulating in the community or in a care home where influenza is likely, within 48 hours of onset. At risk: 65 years or over, chronic respiratory disease (including COPD and asthma) significant cardiovascular disease (not hypertension), immunocompromised, diabetes mellitus, chronic neurological, renal or liver disease and pregnant women. Annual vaccination is essential for all those at risk of influenza.
4. If there is sufficient earwax or debris to obstruct topical medication, consider cleaning the external auditory canal (may require referral). If there is extensive swelling of the auditory canal, consider inserting an ear wick (may require referral). Topical medication is recommended unless there is evidence of spreading cellulitis or patient systemically unwell.
   Condition may be painful – prescribe paracetamol or ibuprofen + / – dihydrocodeine or codeine for pain. Provide appropriate aural hygiene self-care advice to aid recovery and to reduce risk of future infection. Pseudomonas aeruginosa is often a colonising organism and does not usually require antibiotic treatment. Aural toilet is usually sufficient. However, in some immunocompromised or diabetic patients it may cause malignant otitis externa, which is a medical emergency – seek specialist advice.
5. Many are viral. Illness resolves in 60% of patients within 24 hours. Antibiotics do not reduce pain in the first 24 hours or subsequent attacks or deafness. Need to treat 7 to 20 children (depending upon age) to reduce pain in one child at 2-7 days. Consider delayed prescription and prescribing analgesia. Macrolides less effective so only use in penicillin allergy.

# Lower respiratory tract infections

| Treatment | 1st Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **Acute bronchitis** Uncomplicated cough | | **Nil** | |
| | **Commonly viral – antibiotics not normally indicated** | | |
| **Acute bronchitis with bacterial infection** | Amoxicillin 500mg tds | Doxycycline 200mg stat then 100mg od | Clarithromycin 500mg bd |
| | **5 days** | | |
| | Indicated by presence of purulent sputum, temperature, crackles and systemically unwell | | |
| **Acute Exacerbations of COPD** | Amoxicillin 500mg tds | Doxycycline 200mg stat then 100mg od | Clarithromycin 500mg bd |
| | **5 days** | | |
| | Treat exacerbations promptly with antibiotics if purulent sputum and increased shortness of breath and / or increased sputum volume. | | |
| **Community acquired pneumonia**[1,4] CRB65 score = 0 | Amoxicillin[2] 500mg tds | Doxycycline 200mg stat then 100mg od | Clairthromycin 500mg bd |
| | **Review at 48 hours, treat for 7 days** | | |

# Lower respiratory tract infections cont:

| Treatment | 1st Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **Community acquired pneumonia**[4] CRB65 Score = 0 and at home **Post-influenzal pneumonia**[3] | Amoxicillin 500mg tds plus Clarithromycin[3] 500mg bd | Doxycycline[3] 200mg stat then 100mg od | |
| | **Review at 48 hours, treat for 7 days** | | |
| **Community acquired pneumonia**[4] CRB65 score = 3-4 Urgent Hospital Admission | If delayed admission IM Benzyl Penicillin or Amoxycillin 1g orally stat | | |

**Notes:**

1. Strep pneumoniae most likely. Start antibiotics immediately. Always review at 48 hours. Unresponsive pneumonia – refer to hospital.
   N.B. Quinolones are not an appropriate empirical choice.
2. Low dose amoxicillin is more likely to select for resistance so use higher doses e.g. 500mg tds in adults.
3. Post influenza co-infection with Staph aureus, or Group A strep and other atypical more likely. Amoxicillin plus clarithromycin or doxycycline alone more appropriate. Review at 48 hours. Unresponsive pneumonia – refer to hospital.
   N.B. Quinolones are not an appropriate empirical choice.
   N.B Mycoplasma infection is rare in over 65s.
4. CRB65 score to help guide and review treatment. Each scores 1
   (i): Confusion (AMT<8) (iii): BP systolic <90 or diastolic = or <60
   (ii): Respiratory Rate >30/min (iv): Age > 65 years

   Score 0: suitable for home treatment
   Score 1-2: hospital assessment or admission
   Score 3-4: urgent hospital admission

# Genito-urinary tract infections

| Treatment | 1st Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **UTI uncomplicated** [1,2,3]<br>No fever / flank pain<br>**HPA UTI Guide**<br>http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1194947404720<br>**No MSU** | Nitrofurantoin 100mg m/r bd<br>or<br>Trimethoprim 200mg bd<br>**3 days women,**<br>**7 days men** | Treatment Failure (Requires sensitivity result) | |
| **UTI pregnancy**[2]<br>Send MSU<br>– start empirical treatment | Nitrofurantoin (not at full-term) 100mg m/r bd | Trimethoprim (not 1st trimester) 200mg bd | Cefalexin 500mg bd |
| | **7 days** | | |
| **Acute Pyelonephritis**[4]<br>Send MSU<br>– start empirical treatment | Co-amoxiclav 500/125mg tds<br>**7 days** | Ciprofloxacin 500mg bd<br>**7 days** | |
| **UTI children**[5,6,6a]<br>Send pre-treatment MSU for all | Trimethoprim<br>or<br>Nitrofurantoin<br>or<br>Amoxycillin (if susceptible) | Cefalexin<br>Under 5 years: 125mg tds.<br>5 years and over: 250mg tds. | |
| | **7 days** | | |

# Genito-urinary tract infections cont:

| Treatment | 1st Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **Recurrent UTI**[2]<br>Women 3 or more UTIs per year<br>**Higher risk CDI in elderly**<br>– avoid antibiotics if possible | Prophylactic doses<br>Nitrofurantoin 50 – 100mg<br>Trimethoprim 100mg<br>**Single dose post coital or once daily at night** | | |
| **UTI**[2]<br>(Long term suppressive treatment)<br>Higher risk CDI in elderly – avoid if possible | Usually only used on recommendation of a consultant.<br>Commonly used drugs and adult dosage:<br>Trimethoprim 100mg at night<br>Nitrofurantoin 50-100mg at night | | |
| **Indwelling urethral catheter**<br>Higher risk CDI in elderly – avoid if possible<br>Dipstick tests are unreliable and should not be used | Bacteriuria is inevitable in long term catheterised patients and catheters should be changed in-line with the catheter policy or clinical need, otherwise 12 weeks.<br>Maintain adequate fluid intake, avoid dehydration.<br>Antibiotics should only be used if systemically unwell and please ensure urine specimens are obtained and labelled correctly i.e. CSU or MSU. | | |
| **Acute Prostatitis**[7]<br>Pre-treatment MSU | Trimethoprim 200mg bd | Ciprofloxacin 500mg bd | |
| | **Review at 14 days, treat for 28 days** | | |

# Genito-urinary tract infections cont:

| Treatment | 〉 1st Choice | 〉 2nd Choice | 〉 3rd Choice |
|---|---|---|---|
| **Epididymo-orchitis**[8] | Doxycycline 100mg bd | Ofloxacin 200mg bd | |
| | **10 to 14 days (review at day 10)** | | |
| **Pelvic Inflammatory Disease**[9]<br>**BASHH**<br>http://www.bashh.org/guidelines (then select 'PID 2012') | Cefixime* 400mg (stat) plus Metronidazole 400mg bd plus Doxycycline 100mg bd | Metronidazole 400mg bd plus Ofloxacin** 400mg bd | |
| | **14 days** | | |
| **Bacterial Vaginosis**<br>Pregnant patients seek advice | Metronidazole 400mg bd (or 2g stat dose) | Metronidazole 0.75% vaginal gel | Clindamycin 2% cream |
| | **7 days** | **5 nights** | **7 nights** |
| **Vaginal Candidiasis**<br>(Non-pregnant) | Clotrimazole 10% cream 5g | Clotrimazole 500mg pessary | Fluconazole 150mg orally |
| | **Stat dose** | | |
| **Vaginal Candidiasis**<br>(Pregnant) | Clotrimazole 100mg pess | Miconazole 2% cream 5g intravaginally twice daily | |
| | **6 nights** | **7 days** | |

# Genito-urinary tract infections cont:

| Treatment | 1st Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **Chlamydia trachomatis**[10] (Opportunity to screen all 15 to 25 yrs) | Azithromycin 1g stat | Doxycycline 100mg bd<br>**7 days** | |
| **Trichomonas** Treat and refer to GUM for contact tracing Pregnant patients seek advice | Metronidazole 2g stat | | |

# Genito-urinary tract infections cont:

**Notes:**

1. Diagnose initially on clinical signs – e.g. dysuria, frequency, haematuria, smell or cloudiness [2 or 3] in absence of vaginal discharge / irritation enough for likely positive diagnosis and empirical treatment. Where symptoms less clear [2 or less] consider dipstick test. Positive nitrite and ideally positive leucocyte + / - protein increases chances of bacterial infection. Treat empirically (or try delayed prescription). Negative nitrate, leukocyte, blood and protein unlikely to be UTI – look for alternative diagnosis.
   Perform MSU on empirical treatment failures only, to determine 2nd line therapy.

2. Nitrofurantoin, trimethoprim and cefalexin for treatment of UTI in adults with reduced renal function. For children seek advice.

   Nitrofurantoin - Avoid if e-GFR less than 45mL/minute/1.73M$^2$; may be used with caution if e-GFR 30-44 mL/minute/1.73M$^2$ as a short-course only (3 to 7 days), to treat uncomplicated lower urinary-tract infection caused by suspected or proven multidrug resistant bacteria and only if potential benefit outweighs risk; risk of peripheral neuropathy; antibacterial efficacy depends on renal secretion of the drug into the urinary tract.

   Trimethoprim - e-GFR less than 10ml/minute/1.73M$^2$ – avoid – (levels need to be monitored).
   e-GFR 15-30 use half normal dose after 3 days, if extended course required.
   e-GFR 15-10 use half-normal dose.

   Cefalexin at normal doses (250mg qds or 500mg bd) is an alternative, except where e-GFR less than 10 mL/minute/1.73M$^2$ when maximum total daily dose is 750mg.
   Note: clinician will need to request cefalexin sensitivity to be reported in these cases (path lab will not know patient's e-GFR).

3. Pivmecillinam and fosfomycin are useful when UTIs are resistant to all our first line agents. Fosfomycin and pivmecillinam are now included in second-line sensitivity testing. Please do not use either of these agents empirically.

   Pivmecillinam - readily available - 400mg tds - 3 days women and 400mg tds - 7 days men.

   Fosfomycin - difficulty with supply and expensive in primary care. Currently a special order via a pharmacy for 3g sachet. 3g stat women. 3g followed by a further 3g forty-eight hours later in men. JPUHT currently use un-licensed capsules - 500mg tds 5 days and may be able to help with supply.

4. Locally we would prefer immediate use of co-amoxiclav first line (not quinolone). Send MSU. Review at 24 hours. Check for bacteriological clearance after one week even if asymptomatic.

# Genito-urinary tract infections cont:

**Notes continued:**

5. Send MSU. Waiting 24 hours for result is not detrimental to outcome.
6. Less than 3 months – urgent referral. Greater than three months use positive nitrite to start treatment. Treatment failures and symptoms suggestive of upper urinary tract involvement – refer.

6a. Trimethoprim:
child 1 month–12 years, 4mg/kg (max. 200mg) bd; or
6 weeks–6 months 25mg bd,
6 months–6 years 50mg bd,
6–12 years 100mg bd.

Nitrofurantoin:
Child 3 months–12 years 750micrograms/kg qds for 3–7 days.

Amoxycillin:
Child 1 month–1 year 125mg tds; increased if necessary up to 30mg/kg tds.
Child 1–5 years 250mg tds; increased if necessary up to 30mg/kg tds.
Child 5–12 years 500mg tds; increased if necessary up to 30mg/kg (max. 1g) tds.

7. There is limited evidence that the quinolones are more effective than trimethoprim. Trimethoprim will be effective in the majority of cases. If you decide to use a quinolone please risk assess for chances of developing C. diff infection.
8. If STD transmitted epididymo-orchitis suspected; refer to GUM as IM ceftriaxone 500mg stat required followed by doxycycline 100mg bd 10 – 14 days in view of high-level gonococcal resistance to quinolones.
9. If STD suspected refer to GUM for treatment, contact tracing and follow-up. Always culture for gonorrhoea and chlamydia prior to treatment.
*IM ceftriaxone 500mg stat. is cephalosporin of choice but less readily available in community – locally we have agreed cefixime 400mg orally as alternative although not ideal (see BASHH guidance).
**28% gonorrhoea isolates resistant to quinolones (so avoid if STD likely).
10. In pregnancy and breast feeding azithromycin is most effective but cure rate is still low, so test for cure after six weeks and be aware of possibility of spread to infant.

# Gastrointestinal tract infections

| Treatment | 1st Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **H pylori in peptic disease**[1]<br>**See notes below**<br>• Proven PUD – endoscoped and biopsy positive – treat<br>• Proven non-ulcer dyspepsia – endoscoped – biopsy positive – treat<br>• Prior PUD – H pylori treatment naïve patients – treat without testing<br>• Prior PUD – previously H pylori treated – need further investigating re-testing – seek advice<br>• Patients under 55 year dyspepsia (no red flag symptoms) – stool antigen positive – treat<br>• Patients over 55 years with new onset / persistent dyspepsia – endoscope – follow advice | Omeprazole 20mg bd<br>plus Clarithromycin 500mg bd<br>plus Amoxycillin 1g bd<br>(or Metronidazole 400mg bd if penicillin allergic)<br><br>or if Clarithromycin intolerant<br>Omeprazole 20mg bd<br>plus Amoxicillin 1g bd<br>plus Metronidazole 400mg bd<br><br>**7 days** | | |
| • Patients developing PUD (shown by endoscopy) on aspirin – biopsy positive treat<br>• Patients developing dyspepsia (no red flag) on aspirin – stool antigen positive – treat<br>• Patients developing dyspepsia on NSAID – PPI prophylaxis if not already receiving<br><br>Contact Dr Matt Williams at JPUHT Gastroenterology Department 01493 453572 for further advice | Omeprazole 20mg bd<br>plus Clarithromycin 500mg bd<br>plus Amoxycillin 1g bd<br>(or Metronidazole 400mg bd if penicillin allergic)<br><br>or if Clarithromycin intolerant<br>Omeprazole 20mg bd<br>plus Amoxicillin 1g bd<br>plus Metronidazole 400mg bd<br><br>**14 days** | | |

# Gastrointestinal tract infections cont:

| Treatment | 1st Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **Giardiasis** | Metronidazole 400mg tds<br>**5 days** | | |
| **Cryptosporidium** | Treatment not normally indicated, except in AIDS related diarrhoea | | |
| **E coli O157 colitis** | As advised by microbiologist. Not normally recommended as antibiotics may increase the risk of haemolytic uraemic syndrome | | |
| **Diverticular Disease** [2] | Trimethoprim 200mg bd and Metronidazole 400mg tds | Co-amoxiclav 500/125mg tds | |
| | **7 days (normally high dose)** | | |
| **Campylobacter** [3] | No antibiotics Fluid replacement | Clarithromycin 500mg bd | |
| | | **3 to 5 days** | |
| **Shigella** [3] | No antibiotics Fluid replacement | | |
| **Salmonella** [3] Immuno-compromised patient seek advice | No antibiotics Fluid replacement | | |

# Gastrointestinal tract infections cont:

| Treatment | 1st Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **CDI**[4] (C. diff toxin positive) | Stop all antibiotics. Stop PPI unless history of GI bleed or confirmed peptic ulcer disease. Treatment guided by Consultant Microbiologist – sensitivities and severity. Oral metronidazole 400mg tds or vancomycin 125mg qds<br>**A minimum of 10 days** | | |

**Notes:**

1. If standard regimens have failed, regimens containing Denol-tab (bismuthate) available as a special from IDIS, or a quinolone e.g. levofloxacin may be recommended. Please do not prescribe these empirically (only on the advice of gastroenterologist or microbiologist).
2. The value of antibiotics for diverticular disease is limited. Secondary care may recommend co-trimoxazole (sulfamethoxazole and trimethoprim) rather than trimethoprim. Be aware co-trimoxazole can rarely cause Stevens-Johnson syndrome and blood dyscrasias - especially in the elderly. Avoid trimethoprim and co-trimoxazole in allergic patients and those on methotrexate.
3. Treatment of Campylobacter, Shigella and Salmonella infections are only indicated in severe or progressive infections exhibiting bloody diarrhoea, fever or abdominal distension. For Shigella and Salmonella consult Microbiologist for antibiotic treatment and duration.
4. Very important to discuss relapsed patients with microbiologist.

# Skin and soft tissue infections

| Treatment | 1st Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **Cellulitis** | Flucloxacillin 500mg qds | Clarithromycin 500mg bd | Co-amoxiclav 500/125mg tds (facial cellulitis) |
| | **7 days in typical community infection with review. If slow response further 7 days treatment.** | | |
| | If MRSA suspected use doxycycline 100mg bd | | |
| | **7 days or if serious admit for i/v antibiotics** | | |
| **Leg Ulcers** Usually colonised Active infection only send pre-treatment swab | Flucloxacillin[1] 500mg qds | Clarithromycin 500mg bd | |
| | **3 to 5 days** | | |
| **Human / Animal bites** Prophylaxis or treatment | Co-amoxiclav 500/125mg tds | Doxycycline 100mg bd plus Metronidazole 400mg tds if severe | Clarithromycin 500mg bd plus Metronidazole 400mg tds |
| | **7 days review at 24 to 48 hours** | | |
| | Clean the wound. Assess tetanus and rabies risk. Antibiotic prophylaxis advised for: bites > 24hr old, crush or puncture wounds, cat bites, hand wound and at risk patients e.g. diabetics, elderly. Human bite: Antibiotic prophylaxis advised. Assess HIV / hepatitis B&C risk | | |

# Skin and soft tissue infections cont:

| Treatment | 1st Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **Wounds badly soiled i.e. dirty, traumatic wounds**<br>Send pre-treatment swab<br>Treat empirically | Co-amoxiclav 500/125mg tds | Clarithromycin 500mg bd plus Metronidazole 400mg tds | |
| | **5 days** | | |
| **Acne**[2]<br>Moderate to severe | Doxycycline[3] 50mg od | Oxytetracycline 500mg bd | Clarithromycin 500mg bd |
| | **At least 3 months** | | |
| **Fungal nail infections**<br>Take nail clippings<br>N.B. Avoid use of nail lacquers / varnishes | Oral terbinifine[4] for dermatophyte infections 250mg od | Pulsed Itraconazole 200mg bd N.B. Works for yeast, dermatophyte and non-dermatophyte infections | |
| | **Fingers 6 to 12 weeks**<br>**Toes 3 to 6 months** | **Fingers 7 days per month – 2 courses**<br>**Toes 7 days per month – 3 courses** | |
| **Herpes zoster/ Shingles**[5] | Aciclovir 800mg five times daily | | |
| | **7 days** | | |

# Skin and soft tissue infections cont:

| Treatment | 1st Choice | 2nd Choice | 3rd Choice |
|---|---|---|---|
| **Infected Diabetic Foot Ulcer**<br>Foot Clinic Referral:<br>Fax 01493 334119 | Patient known to be MRSA positive – discuss with Microbiologist – do not use empirical guidelines – otherwise: Assess severity of infection – remembering redness/swelling/warmth may be reduced in presence of ischaemia and nephropathy. **Note:** Superficial swabs rarely identify the pathogen. If possible take deep wound swabs,tissue from the ulcer base or aspirated pus and send to microbiology. Initiate empirical antibiotics as below, mark the cellulitic margin and refer to foot clinic. | | |
| **With minor infection** | Flucloxacillin 500mg to 1g qds | Clarithromycin 500mg bd | |
| | **10 days** | | |
| **Osteomyelitis, without spreading infection** | Flucloxacillin 1g qds plus sodium fusidate 500mg tds | | |
| | **Up to six weeks of both antibiotics with review[6]** | | |
| **With necrosis**<br>(managed by clinic) | Add Metronidazole 400mg tds | | |
| | **duration depends on microbiology and necrosis[6]** | | |
| **Antibiotic Prophylaxis** | See latest edition of BNF – Guidance given is comprehensive and up to-date | | |

# Skin and soft tissue infections cont:

**Notes:**

1. If flucloxacillin is the recommended treatment, check that MRSA has not been cultured and / or there is no previous history of MRSA.
   If MRSA is / has been present – don't use flucloxacillin – it will be ineffective.
2. Propionibacterium acnes. The tetracyclines should not be used in pregnancy, during breastfeeding, or in children under 12 years of age, as they are deposited in the teeth and bones of the unborn or developing child.
3. Doxycyline is first choice based on cost and convenience.
4. Idiosyncratic liver reactions occur rarely with terbinafine.
5. Non-ophthalmic: Treat >50 yrs. if <72hrs of onset of rash, as post-herpetic neuralgia rare in <50 yrs but occurs in 20% >60 yrs. Always treat ophthalmic zoster / also if eczema / Ramsey Hunt syndrome – urgently seek specialist advice.
6. Monitor LFTs weekly.

# Eye infections

| | |
|---|---|
| **Conjunctival Infections** | Chloramphenicol 1% ointment or 0.5% drops four to six times a day into both eyes |
| | **Circa – 5 days (48 hours after resolution)** |

## Notes:

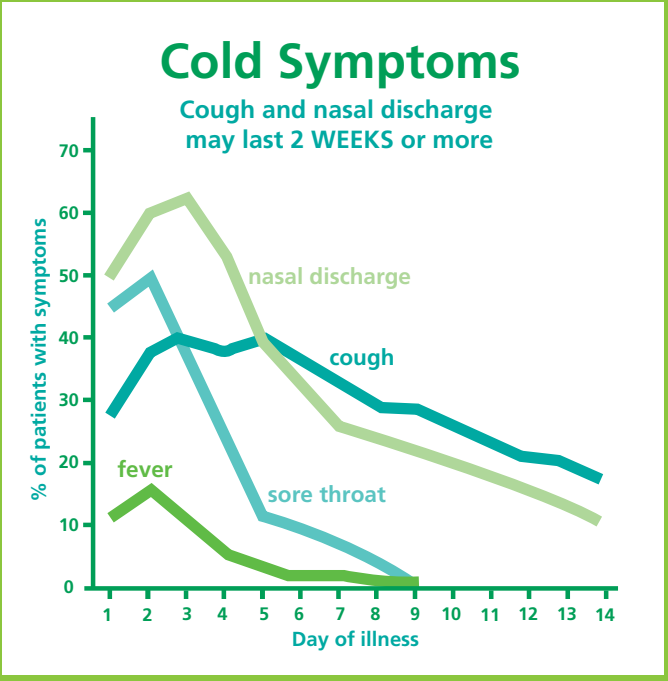
# Mean duration of illness and symptoms

It may be helpful to advise patients of the average total length of the illness (before and after seeing the doctor)

| | |
|---|---|
| • acute otitis media: | 4 days |
| • acute sore throat/acute pharyngitis/acute tonsilitis: | 1 week |
| • common cold: | 1 1/2 weeks |
| • acute rhinosinusitis: | 2 1/2 weeks |
| • acute cough/acute bronchitis: | 3 weeks |

Note: these are average durations: about one half of all patients will experience symptoms for longer.

**The graph below provides an estimate of the duration of common cold symptoms.**



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