



2014

Antimicrobial Guide and Management of Common Infections in Primary Care

Strategies to Optimise Prescribing of Antimicrobials in Primary Care

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Incorporating the
Mid Mersey Antimicrobial guidelines 2011
And
North Mersey Antimicrobial guidelines 2012

A joint initiative between;

Aintree University Hospitals NHS Trust
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Liverpool Women's Hospital NHS Foundation Trust
The Royal Liverpool & Broadgreen University Hospitals NHS Trust
Southport & Ormskirk NHS Trust
St Helens & Knowsley Teaching Hospitals NHS Trust
Warrington & Halton Hospitals NHS Foundation Trust
Merseycare NHS Trust
5 Boroughs Partnership
Liverpool Community Health
Liverpool CCG
Knowsley CCG
South Sefton CCG
Southport & Formby CCG
St Helens CCG
Halton CCG
Warrington CCG
West Lancashire CCG

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Antimicrobial Guide and Management of Common Infections in Primary Care settings

Introduction

This edition of the 'Antimicrobial Guidelines and Management of Common Infections in Primary Care' has been designed with three aims in mind:

- To encourage the rational and evidence-based use of antibiotics
- To minimise the emergence of bacterial resistance
- To provide a simple, pragmatic approach to the management of common infections in primary care

Antimicrobials should only be prescribed when there is proven or strongly suspected bacterial infection and in all cases the benefit of administering the medicine should be considered in relation to the risk involved. This is particularly important during pregnancy, when breastfeeding, using drugs in children and the elderly, and considering documented allergies to antimicrobials previously prescribed. These guidelines are **not** based on costs. **Some of the recommendations in this guideline are unsuitable for pregnant women (unless otherwise stated). Please refer to BNF for alternative antimicrobials in pregnancy.**

Management of an infection will not always mean prescribing an antimicrobial drug. Prescribers using this guide will have the best chance of using the most effective strategy first. This edition of the guide has been reviewed by the Pan-Mersey Antimicrobial Steering Group with input from both primary and secondary care practitioners.

Things you can do to make a difference:

- **Don't prescribe antibiotics for viral sore throats, simple coughs and colds**
- **Use this guideline to reduce the risk of antimicrobial resistance by avoiding unnecessary use of broad spectrum antimicrobials such as cephalosporins, quinolones, clindamycin and co-amoxiclav.**
- **Limit prescribing for uncomplicated cystitis to three days in non-pregnant, otherwise fit women of child-bearing age.**
- **Avoid widespread use of topical antibiotics, especially when available systemically.**
- **Don't prescribe antibiotics over the telephone, other than in exceptional cases.**
- **Don't list antibiotics on your repeat prescribing system, other than in exceptional cases.**
- **Use this guide, and consider using a 'delayed' prescription where this has been shown to be effective.**
- **Using patient information leaflets can reduce antibiotic use. See useful references p5.**
- **Always check previous positive microbiology results prior to starting antibiotics. The empirical regimes in this guideline cover most organisms, however, if the patient has a history of multi-resistant organisms not covered by this guideline, please contact a microbiologist**

This Antimicrobial Guide aims to produce rational prescribing by the individual practitioner for their patients. The British National Formulary (BNF) and Summary of product Characteristics provide additional information on the side effects and contraindications of all the drugs listed. Doses in this guideline are for adults unless otherwise stated.

Useful References

Health Protection Agency. Management of Infection Guidance for Primary Care.
http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1279888711402

RCGP TARGET Antibiotics Toolkit

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

The aim of the toolkit is to provide a central resource for clinicians and commissioners about safe, effective, appropriate and responsible antibiotic prescribing,

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

European Antibiotics Awareness Day

A collection of campaign materials used for this awareness day on November 18th.

<http://ecdc2007.ecdc.europa.eu/en/EAAD/Pages/Home.aspx>

Laboratory sensitivity reports

Please note that sensitivities for antimicrobials other than those recommended in these Guidelines may be reported, but **should only be prescribed where the guideline choices are inappropriate**. Empirical treatment should always be used according to these guidelines unless sensitivities indicate otherwise.

“Help your Microbiology Department to help you”. Including as much clinical information as possible on the sample request form will allow the most appropriate sensitivities to be reported e.g. type of urine sample, antimicrobials already tried, pregnancy, significant co-morbidities such as chronic kidney disease, allergies.

Penicillin allergy

All medical and non-medical prescribers are reminded of the advice contained in the **BNF** www.bnf.org/

“Individuals with a history of anaphylaxis, urticaria or rash **immediately** after penicillin administration are at risk of ***immediate hypersensitivity*** to a penicillin; these individuals **should not receive a penicillin**. Patients who are allergic to one penicillin will be allergic to all because the hypersensitivity is related to the basic penicillin structure. **As patients with a history of immediate hypersensitivity to penicillins may also react to cephalosporins and other beta-lactam antimicrobials, they should not receive these antimicrobials.**

Individuals with a history of a minor rash (i.e. non-confluent, non-pruritic rash restricted to a small area of the body) or a rash that occurs more than 72 hours after penicillin administration are *probably not allergic to penicillin* and in these individuals a penicillin should not be withheld unnecessarily for serious infections. The possibility of an allergic reaction should, however, should be borne in mind. Other beta-lactam antibiotics (including cephalosporins) can be used in these patients.”

***Clostridium difficile* infection – risk assessment and reduction strategies**

Clostridium difficile can be present in the gut without causing illness. It is estimated that 66% of infants and 3% of healthy adults carry *Clostridium difficile*. In some circumstances, *Clostridium difficile* can produce toxins that cause *Clostridium difficile* infection [CDI]. The spectrum of CDI ranges from mild diarrhoea to severe colitis/ toxic megacolon and can be life threatening.

Risk factors for CDI include:

- Recent treatment with broad-spectrum antibiotics
- Serious underlying disease +/- immunosuppression
- Age > 65 years
- Recent treatment with acid suppressants, particularly PPIs

Environmental contamination with *C. diff* spores has been documented in healthcare establishments, including care homes, and can persist for many months, with carpets and soft furnishings acting as potential reservoirs for infection of a susceptible patient.

Alcohol gels are ineffective against *C. difficile* spores.

Recent experience in the care home sector locally has highlighted the continuing need for **ALL PRESCRIBERS** to be cautious when prescribing broad spectrum antibiotics or PPIs, ***particularly for the elderly.***

Every opportunity should be taken to review patients on long-term PPIs and to step down and stop treatment if appropriate.

Care homes have residents registered with various GP practices & so individual prescribers may be unaware that there have been cases of *C. difficile* in a specific home. Even when the staff of the home rigorously apply infection control procedures, it is still vital that ALL PRESCRIBERS continue to follow the advice in the current **Primary Care Antimicrobial Guideline**.

Advice on infection prevention and control of *C. difficile* can be obtained from your local community Infection prevention and control teams listed on p7.

References

Department of Health (2007) A Simple Guide to *Clostridium difficile*. 16/07/07

www.dh.gov.uk

Department of Health and Health Protection Agency (2009) ***Clostridium difficile* infection: How to deal with the problem.** Department of Health, Jan 2009.

www.dh.gov.uk/publications

Health Protection Agency (2011) Topics A-Z *Clostridium difficile* www.hpa.org.uk

Public Health England (2013) **Updated guidance on the management and treatment of *Clostridium difficile* infection.** May 2013

http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317138914904

MRSA bacteraemia – risk assessment and reduction strategies

Known risk factors for MRSA bacteraemia:

- Invasive indwelling devices – such as indwelling urinary catheter
- Chronic illness – especially diabetes, renal dysfunction, impaired immunity
- Chronic skin conditions
- Wounds / non intact skin
- Antimicrobial therapy especially 3rd generation cephalosporins and fluoroquinolones
- Advanced age
- Previous hospitalisation
- Male gender

Screening for MRSA

Early identification of patients at risk of MRSA bacteraemia may prevent the patient from becoming septic & requiring hospital admission.

Follow your local Infection Prevention and Control procedures for screening patients.

Suppression therapy (also known as decolonisation)

For patients known to have MRSA, suppression may be indicated. The purpose of suppression is to lower the burden of MRSA in the nose and on the skin in order to reduce the risk of bacteraemia / other severe infections and to reduce transmission.

MRSA can develop resistance to the products used for suppression. Therefore suppression therapy should only be used when there is a clear indication.

Always follow your local Infection Prevention and Control procedures for suppression therapy.

PVL producing *Staphylococcus aureus*

Panton – Valentin Leukocidin (PVL) is a toxin produced by some strains of *Staphylococcus aureus* (both MRSA and MSSA). Less than 2% of *Staphylococcus aureus* produce PVL in the UK. They can occasionally cause severe infections such as bacteremia or necrotizing pneumonia. Young healthy people can be affected especially those living in communal settings or partaking in contact sports.

A history of recurrent boils / pus producing skin infection is an indication of PVL. If you suspect PVL please take samples and specifically request PVL testing as not all laboratories routinely test for PVL. For further advice contact your Infection Prevention and Control Team / Microbiologist.

**FOR ADVICE ON MRSA SUPPRESSION, PLEASE
REFER TO YOUR LOCAL POLICY OR CONTACT
YOUR LOCAL INFECTION PREVENTION &
CONTROL TEAM**

CCG	Community Infection Prevention & Control Teams - contact numbers
Halton	01744 624159 or 01744 457206 mobile 07900 226782
Knowsley	0151 292 3519 or 0151 676 5440
Liverpool	0151 295 3036
South Sefton	0151 295 3036
Southport & Formby	0151 295 3036
St Helens	01744 624159 or 01744457206 mobile 07900 226782
Warrington	01925 843723

References

Department of Health (2006) **Saving Lives: a delivery programme to reduce Healthcare Associated Infection, inc MRSA. Screening for Meticillin Resistant Staphylococcus aureus (MRSA) colonization. A strategy for NHS Trusts: a summary of best practice.** November 2006.

Fraise A.P & Bradley C (2009) **Ayliffe's Control of Healthcare-Associated Infection. A Practical Handbook, 5th edition.** Hodder Arnold Publishing

Public Health England (2009) Frequently Asked Questions on MRSA.
<http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/StaphylococcusAureus/GeneralInformation/staphFrequentlyAskedQuestions/> 04/11/2009 last accessed 24/10/13

Treatment of Splenectomy Patients

Patients who suffer with asplenia or hyposplenia are at increased risk of overwhelming bacterial infection. Infection is most commonly pneumococcal but other organisms such as *Haemophilus influenzae* type b and meningococci may be involved.

This risk is greatest in the first two years following splenectomy and is greater amongst children but persists into adult life.

Vaccination schedule (updated in line with Green Book)

Suggested schedule for immunisation with conjugate vaccines in individuals with asplenia, splenic dysfunction, immunosuppression or complement deficiency			
Age at which asplenia, splenic dysfunction or immunosuppression acquired or when complement deficiency diagnosed	Vaccination schedule Where possible, vaccination course should ideally be started at least two weeks before surgery or commencement of immunosuppressive treatment. If not possible, see advice in the pneumococcal chapter of the Green Book.		
	Month 0	Month 1	Later
First presenting under two years	Complete according to national routine childhood schedule including booster doses of Hib/MenC and PCV13.	A dose of MenACWY conjugate vaccine should be given at least one month after the Hib/MenC and PCV13 booster doses	After the second birthday, one additional dose of Hib/MenC and a dose of PPV should be given.
First presenting over two years and under five years (previously completed routine childhood vaccinations with PCV7)	Hib/MenC booster PCV13	MenACWY conjugate vaccine	PPV (at least 2 months after PCV13)
First presenting over two years and under five years (previously completed routine childhood vaccines with PCV13)	Hib/MenC booster PPV	MenACWY Conjugate vaccine	
First presenting over two and under five (unvaccinated or previously partially vaccinated with PCV7)	Hib/MenC vaccine First dose of PCV13	MenACWY conjugate vaccine	Second dose of PCV13 and then PPV (at least two months after PCV13)
First presenting over five years (regardless of vaccination history)	Hib/MenC vaccine PPV	MenACWY conjugate vaccine	

PCV = pneumococcal conjugate vaccine, PPV = pneumococcal polysaccharide vaccine

Data on long-term antibody levels in these groups of patients are limited. Additional doses to cover the higher risks of Hib, meningococcal and pneumococcal disease during childhood, should be considered, depending on the child's underlying condition. Specialist advice may be required.

Please check online for most up to date information

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/147827/Green-Book-Chapter-7.pdf

Prophylactic antibiotics should be offered to all patients.

Lifelong antibiotic prophylaxis is appropriate for high-risk groups including those individuals:

- aged less than 16 years or greater than 50 years
- with inadequate serological response to pneumococcal vaccination,
- a history of previous invasive pneumococcal disease,
- splenectomy for underlying haematological malignancy, particularly in the context of on-going immunosuppression.

Low-risk patients should be counselled as to the risks and benefits of prophylaxis, particularly where adherence is an issue.

Lifelong compliance with prophylactic antibiotics is problematic. If the patient does not continue to be at high risk as per the criteria above, the patient must have antibiotic prophylaxis until at least 2 years after splenectomy.

If compliance is a problem, patient must be advised to have an emergency supply of amoxicillin or erythromycin to take in the event of fever as well plus be advised to seek medical attention urgently.

Phenoxymethylpenicillin is preferred unless cover is also needed against Haemophilus influenza for a child (in which case, give amoxicillin) or if the patient is allergic to penicillin, give erythromycin).

Phenoxymethylpenicillin	Children < 1 year Children 1-5 years Children 5-18 years Adult	62.5mg bd 125mg bd 250mg bd 500mg bd
Amoxicillin	Child 1 month – 5 years Child 5 -12 years Child 12 – 18 years	125mg bd 250mg bd 500mg bd
Erythromycin	Child under 2 years Child 2-8 years > 8 years and adults	125mg bd 250mg bd 500mg bd

Adapted from BNF for children 2011-12 and HPA guidelines

Other measures to reduce risk include:

- ✓ Patients should be asked to consult if they have a febrile illness and may be given a stock of antibiotics to start treatment by themselves. They should carry a card and/or Medic-Alert bracelet or necklace.
- ✓ When travelling abroad patients should obtain advice from a reputable travel advice centre (e.g. Liverpool School of Tropical Medicine) to ensure precautions are adequate and up to date.
- ✓ Patients should avoid malaria (which is more severe in asplenic patients) by avoiding malaria areas or, if going to such areas, adhere scrupulously to antimalarial prophylaxis and anti-mosquito precautions.
- ✓ Avoid tick bites as there is a risk of Babesiosis and Lyme disease.

Eye, Ear Nose and Throat

Management of acute sore throat

Clinicians should consider the potential for bacterium Group A β -haemolytic streptococcus (GABHS) infection.

Clinical prediction for the presence or absence of Group A β -haemolytic streptococcus in acute sore throat in adults (GABHS)

The Centor Criteria	
<ul style="list-style-type: none">• Tonsillar exudate• Tender anterior cervical lymphadenopathy• Absence of cough• Current pyrexia > 38° C	<ul style="list-style-type: none">✓ The presence of 3 out of 4 of the Centor criteria have a positive predictive value of 40-60% for GABHS✓ The absence of 3 out of 4 of the Centor criteria has a negative predictive value of 80%.

Recommendations

- ❑ If the patient has three or four of the Centor criteria present treat with antibiotics
- ❑ If the patient has only one or two of the Centor criteria present do not treat with antibiotics
- ❑ Risk of GABHS is higher in age group 3 – 14 years
- ❑ Provide analgesics and antipyretics if necessary regardless of the presence of these criteria
- ❑ If in doubt or the patient is insistent on an antibiotic consider using a deferred prescription.

The use of delayed prescriptions

- Giving out antibiotics automatically for sore throat increases the number of future consultations for the same symptoms
- For every 9 patients not automatically given antibiotics one future consultation is avoided.
- See NICE Clinical Guideline 69 for information on the average total length of common respiratory tract infections

<http://www.nice.org.uk/nicemedia/pdf/cg69fullguideline.pdf>

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Acute viral sore throat	No antibiotic indicated Issue Patient Information Leaflet (PIL) on viral sore throats If in doubt, use of deferred prescription is an option	Use CENTOR to guide diagnosis If 3 or 4 present treat as for bacterial sore throat (see below) N.B. If symptoms persist refer to ENT

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Acute laryngitis	No antibiotic indicated Issue Patient Information Leaflet (PIL) on viral sore throats see useful references p3	
Acute bacterial sore throat	Phenoxymethylpenicillin 500mg qds for 10 days or Clarithromycin 500mg bd for 5 days if allergic to penicillin	Take a throat swab if Centor criteria apply, and in persistent infections lasting 3-4 weeks (CKS) or family or institutional outbreaks Treatment advice also applies to Scarlet Fever but for 10 days
Acute sinusitis	Use symptomatic relief (analgesia) before prescribing antibiotics Amoxicillin 500mg tds for 7 days or Doxycycline 200mg stat. then 100mg od for 7 days in total (for children under 12 use clarithromycin instead of doxycycline) For persistent symptoms Co-amoxiclav 625mg tds for 7 days	Avoid antibiotics as 80% resolve in 14 days without, and they only offer marginal benefit after 7 days.
Chronic sinusitis	Refer to ENT and treat according to advice	
Conjunctivitis	Chloramphenicol 0.5% eye drops 2 hourly for 2 days then 4 hourly (whilst awake) and Chloramphenicol 1% ointment at night Fusidic acid 1% gel two times a day Treat for 48 hours after resolution.	Treat if severe, as most viral or self-limiting. 65% of cases resolve on placebo by day 5 For neonatal infections, take a swab for Chlamydia prior to initiation of therapy. If no response after 3 days refer.

Management of acute otitis media (AOM)

- Consider whether admission or referral is necessary. **For children younger than 3 months of age with acute otitis media (AOM)**, maintain a low threshold for admission.
- Treat pain and fever with paracetamol or ibuprofen if there are no contraindications.
- **Consider whether antibiotics are required. For most people with suspected acute AOM**, advise a no antibiotic prescribing strategy or a delayed antibiotic prescribing strategy.
- **For children younger than 3 months of age with AOM**, maintain a low threshold for prescribing antibiotics.

Offer an immediate antibiotic prescription to:

- People who are systemically very unwell (but who do not require admission)
- People at high risk of serious complications because of significant heart, lung, renal, liver, or neuromuscular disease, immunosuppression, or cystic fibrosis, and young children who were born prematurely
- People whose symptoms of AOM have already lasted for 4 days or more and are not improving.

Depending on severity, consider offering an immediate antibiotic prescription to:

- Children younger than 2 years of age with bilateral AOM
- Children with perforation and/or discharge in the ear canal (otorrhoea) associated with AOM.

Children under the age of 2 years are more at risk than older children. If antibiotics are withheld, careful surveillance is recommended (see references below)

See NICE Clinical Guideline 160 for information on managing fever in children under 5 years

<http://guidance.nice.org.uk/CG160>

See NICE Clinical Guideline 69

<http://www.nice.org.uk/nicemedia/live/12015/41322/41322.pdf>

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Acute otitis media	First line treatment is paracetamol or ibuprofen and observe If no improvement after 72 hours; Amoxicillin tds: 1 month – 18 years; 40mg/kg daily in 3 divided doses (max. 1.5g daily in 3 divided doses) for 5 days or if allergic to penicillin Clarithromycin bd for 5 days.	80% of cases will resolve in 72 hours. If no vomiting and temp <38.5 use Paracetamol or ibuprofen. If in doubt, use of a DELAYED PRESCRIPTION is an option
Chronic otitis media		Refer to ENT

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Otitis externa	<p>First use aural toilet (if available) and analgesia. First line: acetic acid 2% (EarCalm®) 1 spray tds for 7 days.</p> <p>Second line: neomycin sulphate with corticosteroid</p>	<p>If cellulitis or disease extending outside ear canal, start oral antibiotics and refer.</p>

Respiratory Tract Infections

Management of acute bronchitis in otherwise healthy adults

Recommendations

- ❑ Exclude pneumonia as a likely diagnosis using patient history and physical examination. The NICE clinical guideline on feverish illness in children (CG160) may be used to aid the diagnosis in children:
<http://publications.nice.org.uk/feverish-illness-in-children-cg160>
- ❑ **Do NOT use quinolone (ciprofloxacin, ofloxacin) first line due to poor pneumococcal activity.**
- ❑ Provide a patient information leaflet explaining the limitations of antibiotics for this indication. **More than 90% of cases of acute bronchitis do not have a bacterial cause**
- ❑ **Purulent sputum can arise from either viral or bacterial infection. The presence of purulent sputum is not a predictor of bacterial infection**
- ❑ Consider using a delayed prescription for antibiotics
- ❑ Annual immunisation against influenza & pneumococcal infection should be offered to all at-risk patients including patients over 65 years.

See NICE Clinical Guideline 69

<http://www.nice.org.uk/nicemedia/pdf/cg69fullguideline.pdf>

The **CRB-65 score** may be used as a tool to predict the severity of community acquired pneumonia in adults:

Use CRB-65 score to help guide and review: Each scores 1:

Confusion (recent);
Respiratory rate >30/min;
BP systolic <90 or diastolic ≤ 60;
Age >65;

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

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Community acquired Pneumonia in adults	<p>If CRB-65 = 0: Amoxicillin 500 mg tds for 7 days or Clarithromycin 500mg bd for 7 days or Doxycycline 200mg stat then 100 mg od for 7 days in total</p> <p>If CRB-65 = 1 & AT HOME, Amoxicillin 500mg tds for 7 days AND Clarithromycin 500mg bd for 7 days or Doxycycline alone 200mg stat then 100mg od for 7 days in total</p>	<p>Only a small range of pathogens causes CAP, with <i>Streptococcus pneumoniae</i> being the most frequent. The frequency of pathogens can vary in specific patient groups. Mycoplasma and legionella infections are less frequent in the elderly. For those patients referred to hospital with suspected CAP, general practitioners may consider administering antibiotics immediately where the illness is considered to be life threatening or if there are likely to be delays (>2 hours) in admission (BTS guidelines 2001).</p>
Community acquired pneumonia in children 0-3 months	Refer to paediatric specialist	http://www.brit-thoracic.org.uk/Guidelines/Pneumonia-Guidelines.aspx
> 3 months	<p>Consider using traffic light assessment tool in the NICE guideline on Feverish Illness in Children to assess the need for admission to hospital</p> <p>Seek specialist advice on treatment or referral</p>	http://publications.nice.org.uk/feverish-illness-in-children-cg160

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Acute cough, bronchitis in otherwise healthy adults	<p>Likely to be viral and not require antibiotics.</p> <p>If antibiotics are indicated: Amoxicillin 500mg tds for 5 days or Doxycycline 200mg stat then 100 mg daily for 5 days in total</p>	Symptom resolution can take 3 weeks. Consider use of delayed antibiotic prescription + advice leaflet
Acute cough, bronchitis with existing co-morbidities and adults over 80.	Refer to NICE CKS guidance	http://cks.nice.org.uk/cough
Acute infective exacerbations of chronic obstructive pulmonary disease	<p>Amoxicillin 500mg tds for 5 days or Doxycycline 200mg stat then 100mg od for 5 days in total or Clarithromycin 500mg bd for 5 days</p> <p>Co-amoxiclav should be reserved for patients with risk factors for antimicrobial resistance e.g. co-morbid disease, severe COPD, frequent exacerbations, antibiotics in last 3 months Co-amoxiclav 625mg tds for 5 days</p>	<p>Treat if dyspnoea with changes in sputum i.e. increase and purulence. Antibiotics are less effective if only one symptom present.</p> <p>Obtain sputum sample wherever possible (before second line antibiotic used) For further information refer to http://www.nice.org.uk/CG12 http://www.goldcopd.org/Guidelines/guidelines-resources.html</p>
Acute viral exacerbations in asthma		Antibiotics not indicated. Symptomatic treatment only
Viral coughs and cold		Antibiotics not indicated. Symptomatic treatment only. Cough may persist for several weeks

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Whooping cough	<p>Treatment should be given to</p> <ul style="list-style-type: none"> Any person in whom the clinician suspects pertussis infection OR Any person with an acute cough lasting for ≥ 14 days without an apparent cause plus one or more of the following: <ul style="list-style-type: none"> paroxysms of coughing post-tussive vomiting inspiratory whoop <p>Clarithromycin 500mg bd for 7 days If allergic to macrolides: co-trimoxazole 960mg bd for 7 days (not in pregnancy)</p>	<p>Treatment of children does not affect duration of illness, but may control the spread of infection as untreated children shed organism for many weeks. Non-infectious coughing may continue for several weeks.</p> <p>NB. cases of pertussis should be notified to Public Health England but treatment should be commenced as soon as possible and not withheld until advice is sought.</p> <p>http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1287142671506</p>
Bronchiolitis / croup in children		<p>Antibiotics NOT indicated.</p> <p>Symptomatic treatment only.</p>
Infective exacerbation of Bronchiectasis	Discuss with appropriate Specialist	Always send a sputum sample
Influenza	<p>Oseltamivir 75mg bd for 5 days (10)</p> <p>For prophylaxis, oseltamivir 75mg daily for 10 days (10) in at-risk adults and for at-risk children with influenza-like illness (ILI) when influenza is circulating in the community.</p> <p>Refer to most recent supporting info from PHE for up to date dosing for children or BNFc.</p> <p>http://www.bnf.org/bnf/org_450055.htm</p>	<p>Avoid use in otherwise healthy adults.</p> <p>Treatment must be started within 48 hours of onset of symptoms of ILI.</p> <p>Local health protection teams will advise when influenza is considered to be circulating in the community</p> <p>To check current situation log onto https://www.gov.uk/government/organisations/public-health-england</p>

Gastrointestinal Infections

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
<p>Acute diarrhoea & vomiting</p> <p>(NB. Food poisoning is notifiable to Consultant in Health Protection)</p> <p>(see also Clostridium difficile section)</p>	<p>Oral rehydration therapy is the mainstay of treatment. Children aged less than six months may be prescribed rehydration sachets, in older age groups clear fluids are adequate</p> <p>Antimotility agents e.g. loperamide should only be prescribed for short-term management of symptoms (1-2 days) in the absence of fever or bloody diarrhoea and only for adults & children over 12 years</p>	<p>Usually viral and self-limiting. Antibiotics only tend to prolong the carrier state, do not shorten the duration of illness and may be contraindicated. Antibiotics should only be commenced on advice of microbiologist or consultant in health protection or Infection prevention and Control. Check travel, food, hospitalisation and antibiotic history (Clostridium difficile is increasing in incidence) Suggest stool specimen if:</p> <ol style="list-style-type: none"> 1. Patients with inflammatory bowel disease. 2. Immunosuppressed patients for further info https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/239274/Green_Book_updated_110913.pdf 3. Persistent diarrhoea (more than one week) if no obvious cause 4. Bloody diarrhoea. Sample essential. Antibiotics may be contraindicated (e.g. <i>E coli</i> 0157) 5. Recent foreign travel 6. Suspected food poisoning.
<p>Campylobacter enteritis</p> <p>N.B. Notifiable to Consultant in Health Protection</p>		<p>Antibiotic treatment not usually indicated.</p> <p>Initiate on the advice of microbiologist if the patient is systemically unwell.</p>
<p>Salmonellosis</p> <p>N.B. Notifiable to Consultant in Health Protection</p>		<p>Antibiotic treatment not usually indicated.</p> <p>Initiate on the advice of microbiologist if the patient is systemically unwell.</p>

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Clostridium difficile (confirmed)	<p>Stop unnecessary antimicrobials +/- PPIs</p> <p>Refer to the Public Health England guidance on management of C. difficile</p>	<p>May occur up to eight weeks after antibiotic treatment.</p> <p>Consider hospital referral if severe symptoms and rule out toxic colitis.</p> <p>PHE Guidance on management May 2013 http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317138914904</p> <p>Testing for clearance of toxin is not required</p> <p>Antimotility agents e.g. loperamide should NOT be prescribed</p>
Giardia lamblia	<p>Metronidazole: Adults: 2g single dose daily for 3 days</p> <p>Children: 1-3 years 500mg daily for 3 days 3-7 years 600-800mg daily for 3 days 7-10 years 1g daily for 3 days</p>	<p>Consider 'blind' treatment of family contacts only if they are symptomatic</p>
Threadworms, pinworms (<i>Enterobius vermicularis</i>)	<p>Mebendazole 100mg stat. For adults and children > 6 months; as re-infection is very common, a second dose may be given after 2 weeks. NB this is an unlicensed use for children under 2 years</p> <p>Piperazine (Pripsen[®] Sachets) Repeat course always needed. Children 3 months – 1 year: one level 2.5ml spoonful repeated after 14 days Children 1- 6 years: one level 5ml spoonful repeated after 14 days Children over 6-18 years:</p>	<p>All members of the family require treatment.</p> <p>Good hygiene is needed to avoid re-infection.</p> <p>Washing hands and scrubbing nails before eating and after visiting the toilet are essential.</p> <p>A bath in the morning removes ova laid overnight.</p>

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
	one sachet repeated after 14 days	
Acute cholecystitis	Provide symptomatic relief prior to admission.	Urgently admit to hospital anyone with suspected acute cholecystitis
Acute exacerbation of diverticulitis	Co-amoxiclav 625mg tds If penicillin allergic: Ciprofloxacin 250-500mg bd PLUS metronidazole 400mg tds, both for 7 days	Consider admission for severe cases. Review within 48 hours, or sooner if symptoms deteriorate. Arrange admission if symptoms persist or deteriorate
Eradication of Helicobacter pylori infection	<p>Option 1: Lansoprazole 30mg bd Clarithromycin 250mg bd Metronidazole 400mg bd for 7 days</p> <p>Option 2: Lansoprazole 30mg bd Amoxicillin 1g bd Clarithromycin 500mg bd for 7 days</p> <p>For children, refer to specialist advice.</p>	<p>Choose regime most suitable for patient's allergies and consultant recommendations.</p> <p>NB Do not use Clarithromycin or Metronidazole if used in the past year for any infection.</p> <p>Eradication is beneficial in known DU, GU or low grade MALToma</p> <p>For NUD, the NNT is 14 for symptom relief.</p> <p>Consider test and treat in persistent un-investigated dyspepsia. Do not offer eradication for GORD.</p> <p>DU/GU relapse: retest for H. pylori using breath or stool test OR consider endoscopy for culture & susceptibility.</p> <p>NUD: Do not retest offer PPI or H2 RA.</p> <p>(Diabact UBT available on FP10)</p> <p>Refer to NICE guidance on Dyspepsia or local Dyspepsia pathway.</p> <p>http://guidance.nice.org.uk/CG17</p>

Urinary Tract Infections

Management of uncomplicated cystitis

Consider whether urine culture is needed

Do not send urine if asymptomatic unless antenatal

THE ELDERLY:

Asymptomatic bacteriuria in the over 65s is very common and is not related to increased morbidity or mortality. Investigation and treatment will increase side-effects and medicalise the condition.

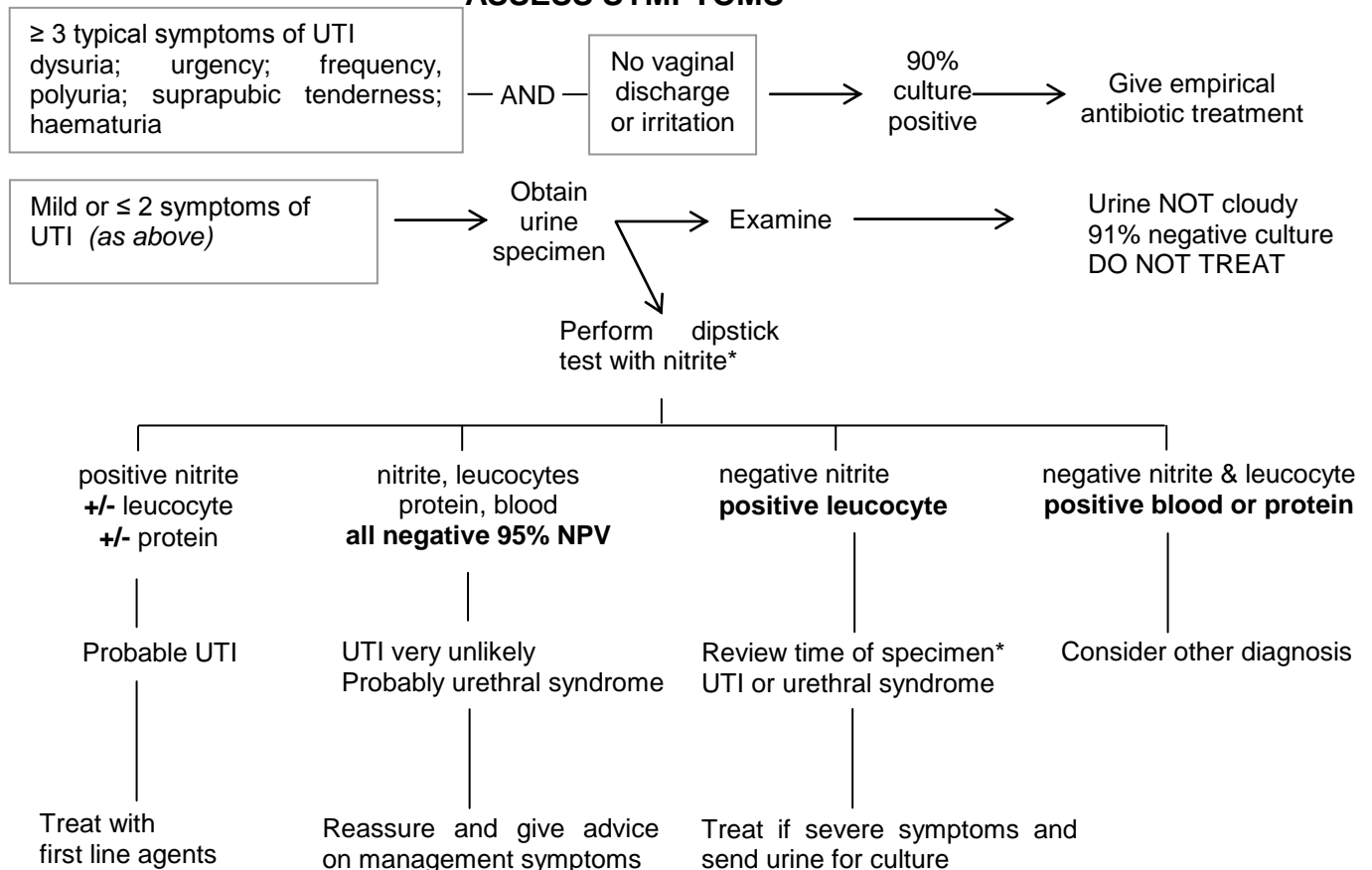
Only sample if: two signs of infection, especially dysuria, pyrexia $>38^{\circ}\text{C}$ or new incontinence. **Treat the patient NOT the urine**

ACUTE UNCOMPLICATED UTI IN ADULT WOMEN: Affects up to 15% of women each year

Routine urine culture is unnecessary. Use symptoms, urine appearance and dipstick urine tests to diagnose UTI and reduce antibiotic use and unnecessary laboratory investigations

50% of women with symptoms of UTI have negative culture and symptoms are due to inflammation of the urethra – the ‘so called’ urethral syndrome.

ASSESS SYMPTOMS



Nitrite is produced by the action of bacterial nitrate reductase in urine. As contact time between bacteria and urine is needed, morning specimens are most reliable. Leucocyte esterase detects intact and lysed leucocytes produced in inflammation. Haematuria and proteinuria occur in UTI but are also present in other conditions. When reading test **WAIT for the time recommended by manufacturer.*

LABORATORY TESTING FOR CULTURE AND SENSITIVITY SHOULD BE PERFORMED IN ;

- Pregnancy -screen for asymptomatic bacteriuria at first antenatal visit, as associated with pyelonephritis and premature delivery. (Dipstick testing should not be used to screen for UTI in pregnancy)
- investigation of possible UTI
- Suspected UTI in children, any sick child and every young child with unexplained fever
- Suspected pyelonephritis (temp $\geq 39.4^{\circ}\text{C}$ rigors; nausea; vomiting; diarrhoea; loin pain or tenderness)
- Impaired host defences e.g. poorly controlled diabetes, immunosuppression
- Recurrent UTI, as resistance more common
- Catheterised patients: Avoid unnecessary samples as bacteriuria is usual. Send sample if features of systemic infection
- Failed antibiotic treatment or persistent symptoms
- Abnormalities of genitourinary tract e.g. calculus, neurogenic bladder, vesicoureteric reflux
- **Renal impairment.**
- **Suspected UTI in men**

In sexually active young men and women with urinary symptoms, consider Chlamydia trachomatis

Infants and Children

Refer urgently to a paediatric specialist a child of any age where there is a high risk of serious illness.

The following reference may be helpful:

<http://eng.mapofmedicine.com/evidence/terms.htm;jsessionid=F5CF8B5F79784FA3BC998DDAFED29B0E?next=/>

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Uncomplicated cystitis in women.	Fluids and Trimethoprim 200 mg bd for 3 days or Nitrofurantoin capsules 50mg qds for 3 days or 100mg MR bd	Asymptomatic bacteriuria in adults or the over 65's should not generally be treated

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
<p>Complicated UTI in women</p> <p>When one or more factors are present predisposing person to persistent or recurrent infection or treatment failure eg UTI with: urinary tract abnormalities incl. calculi; impaired host defences, impaired renal function (see NICE Clinical Knowledge Summaries (CKS) definitions),</p>	<p>Fluids and Trimethoprim 200mg bd for 10 days or nitrofurantoin 50mg qds or 100mg MR bd for 10 days</p> <p>Renal impairment CKD stages 1,2 or 3: Trimethoprim 200mg bd for 10 days in patients with eGFR >30</p> <p>Nitrofurantoin capsules 50mg qds for 10 days (or 100mg MR bd) is 2nd line alternative if eGFR >60 (CKD stage 1)</p> <p>Patients with CKD 4 or 5 ie eGFR<30: Cefalexin 500mg bd for 10 days</p>	<p>Submit MSU whenever possible and prescribe when sensitivities are known.</p> <p>Choice of antimicrobial agent should be based on sensitivities of the urine isolate and clinical assessment.</p> <p>If patient suffers repeat infection but had responded to a first line agent on a previous occasion, that same agent should be restarted rather than assuming that an alternative agent will be necessary. If trimethoprim is unavoidable in patients at risk of hyperkalaemia ie CKD 4&5, then U&E monitoring is advised. Review and consider temporary withdrawal of ACE-I, ARB or spironolactone depending on clinical assessment and indication for these drugs.</p>
<p>UTI in Men</p>	<p>Fluids and Trimethoprim 200mg bd for 7 days or</p> <p>Nitrofurantoin capsules 50mg qds for 7 days (or 100 mg MR bd)</p> <p>Renal impairment CKD stages 1,2 or 3: Trimethoprim 200mg bd for 7 days in patients with eGFR >30 or</p> <p>Nitrofurantoin capsules 50mg qds for 7 days (or 100mg MR bd) is 2nd line alternative only if eGFR >60</p> <p>Patients with CKD 4 or 5 ie eGFR<30: Cefalexin 500mg bd for 7 days</p>	<p>Submit MSU wherever possible. Consider referral. Or consider Chlamydia in sexually active age group. Avoid PSA testing – levels will be raised</p>

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
UTI in Pregnant women	<p>Fluids and Nitrofurantoin 50mg qds (or 100mg MR) bd for 7 days except at term</p> <p>Or Cefalexin 500mg bd for 7 days</p> <p>Or trimethoprim 200mg bd for 7 days (off-label) unless folate deficient (see adjacent comment)</p>	<p>Submit MSU for culture and repeat MSU after treatment completed.</p> <p>Asymptomatic bacteriuria in pregnancy should usually be treated.</p> <p>Amoxicillin may be recommended where resistance patterns are low.</p> <p>Trimethoprim should be supplemented with folate in 1st trimester. Avoid if taking other folate antagonists eg antiepileptic or proguanil)</p>
<p>Recurrent UTI in non-pregnant women > 3 UTIs/year due to relapse or reinfection.</p> <p>Relapse is likely caused by same strain of organism if infection recurs within a short period eg within 2 weeks after treatment.</p> <p>Reinfection is recurrent UTI with <i>a different strain or species</i> of organism and is the likely cause if UTI recurs more than 2 weeks after treatment.</p>	<p>Fluids advised.</p> <p>Often multi-resistant.</p> <p>Treat for 7 days</p>	<p>Treat on basis of culture and sensitivity. Consider referral as may be underlying cause.</p> <p>Further local advice on the management of recurrent UTI in adult women and adult men is available via:</p> <p>www.mapofmedicine.com</p>
Prophylaxis for recurrent UTI in adults	<p>Post-coital or stand by antibiotics may reduce occurrence</p> <p>Nitrofurantoin 50-100mg post-coital stat or trimethoprim 100mg prophylaxis nocte (off – label)</p>	<p>Refer to urology. Patients should be reviewed at regular intervals to assess the risk:benefits in relation to C difficile infection. Prophylactic antibiotics should be reviewed after 6months and stopping should be considered.</p>
Acute pyelonephritis in adults	<p>Ciprofloxacin 500mg bd for 7 days</p> <p>Or co-amoxiclav 500/125 for 14 days</p>	<p>Submit MSU and consider blood culture and admission.</p> <p>Prescribe analgesia (paracetamol or ibuprofen) for pain and fever</p>

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Bladder catheter in situ	Treat only if associated with systemic symptoms, e.g. pyrexia, rigors.	<ol style="list-style-type: none"> 1. Ensure high fluid intake. 2. Where adequate fluid intake cannot be assured and bladder washout indicated, use saline. 3. There is a high incidence of bacteriuria with long-term catheters. Antibiotics do not eliminate these, but lead to the growth of resistant organisms. 4. Dipstick testing should not be performed on CSU specimens (SIGN guidelines) 5. Culture of urine is not normally advised 6. Antibiotics will not eradicate asymptomatic bacteruria: only treat if systemically unwell or pyelonephritis likely. Do not use prophylactic antibiotics for catheter changes unless history of catheter-change associated UTI or trauma.
Epididymo-orchitis Refer to GUM/Sexual Health Service if sexually active	<p>Ciprofloxacin 500mg stat plus Doxycycline 100mg bd for 14 days in sexually active men</p> <p>Ciprofloxacin 500mg bd for 10 days if Enterobacteriaceae</p>	Sexual history is imperative. If sexually active (especially < 35 years) <i>C trachomatis</i> and / or <i>N gonorrhoea</i> most likely – refer to GUM/Sexual Health service . Submit MSU. If infection follows recent hospitalisation with bladder catheterisation or in the elderly, use Ciprofloxacin.
Prostatitis	<p>Ciprofloxacin 500mg bd for 4 weeks</p> <p>2nd line trimethoprim 200mg bd 28 days</p>	Prolonged treatment required. Consider Chlamydia infection.
Urethritis		Refer to GUM/Sexual Health Service and submit MSSU.

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Sterile pyuria		If sexually active consider Chlamydia and refer to GUM/Sexual health service . Tuberculosis, fastidious organisms and tumours or stones are associated with sterile pyuria (as is concurrent antimicrobial treatment). Refer to urology.
UTI in infants < 3 months		Refer immediately to Paediatrician.
Cystitis / Lower UTI – Infants & children > 3 months	Treat if positive nitrite on dipstick with fluids and Trimethoprim bd for 3 days at treatment dose 2 nd line Co-amoxiclav tds for 3 days	Always submit a pre-treatment urine sample, clean catch if possible. Consider prophylaxis after treatment if recurrent infection or systemically unwell and refer to Paediatrician.
Acute pyelonephritis / Upper UTI - Infants & children > 3 months	Co-amoxiclav tds for 7 days	Always submit urine sample, clean catch if possible. Consider referral to Paediatrician, depending on severity or in penicillin allergy.

Genito-urinary Infections

Clinical diagnosis	Treatment advice/ adult dosages	Comments and guidelines for lab testing
Vaginal Discharge a) Candidiasis	Clotrimazole pessary 500mg stat or vaginal cream 10% stat at night or Fluconazole 150mg stat (1) In pregnancy avoid oral azoles and use intravaginal treatment for 7 days clotrimazole 100mg pessary nocte for 6 nights or miconazole 2% cream 5g intravaginally bd for 7 days	Investigate recurrent cases (4 or more episodes annually) and refer if appropriate
b) Trichomonas vaginalis	Metronidazole 400mg bd for 7 days In pregnancy or breastfeeding avoid 2g single dose metronidazole. Consider clotrimazole 100mg pessary at night for 6 nights for symptom relief only (note: this has no activity against trichomonas).	MUST be referred to GUM/Sexual Health Services for contact tracing & follow-up. Sexual partners should be treated simultaneously.
c) Bacterial vaginosis	Metronidazole 400mg bd for 7 days If pregnant, Clindamycin 2% cream 5g pv at night for 5 nights Or metronidazole 0.75% vaginal gel 5g applicatorful at night for 5 nights	Refer to GUM/Sexual Health Services if diagnosis is uncertain
d) Children	Be guided by swab and culture sensitivity as often unexpected pathogens such as H influenzae, pneumococci or group A streptococci are present	Consider all possible causes including foreign bodies and abuse. If abuse suspected refer urgently to paediatricians and consider safeguarding issues
Candida balanitis	Clotrimazole cream 2%	Check for underlying problems

Clinical diagnosis	Treatment advice/ adult dosages	Comments and guidelines for lab testing
Pelvic sepsis / pelvic inflammatory disease	Ofloxacin 400mg bd for 14 days plus Metronidazole 400mg bd for 14 days	Consider Chlamydia infection. MUST be referred to GUM/Sexual Health Services for contact tracing and follow-up It may be preferable to <u>initiate</u> treatment in primary care if there would be a delay of >24h until the patient was assessed by GUM/Sexual Health Service. If gonorrhoea likely, refer to GUM/Sexual Health Service
Chlamydia infection	Azithromycin 1g stat or Doxycycline 100mg bd for 7 days If at risk of pregnancy: Azithromycin 1g stat (most effective but off-label use) or Erythromycin 500mg qds for 7 days Or Amoxicillin 500mg tds for 7 days Pregnant patients should be given a test of cure 5 weeks after completing therapy (6 weeks after azithromycin). For suspected epididymitis in men ofloxacin 400mg bd 14 day Doxycycline 100mg bd 14 days	Treat partners & refer to local Sexual Health / GU service Look for signs of PID or epididymitis and refer to appropriate guidance. Exclude other STI. If gonorrhoea is not reasonably excluded, use of azithromycin alone may contribute to development of resistance. Patients should be advised that they should refrain from any sexual activity until they and their partner(s) have completed treatment. N.B. May be asymptomatic or mild symptoms of infection
Genital herpes Refer all patients to GUM/Sexual Health Service for virological confirmation. Phone local department same day.	Aciclovir 400mg tds for 5 days	It may be preferable to <u>initiate</u> treatment in primary care if there would be a delay of >24h until the patient was assessed in GUM/Sexual Health Service

Skin Infections

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Impetigo	<p>As resistance is increasing, topical treatment should only be used when a few localised lesions are present:</p> <p>Fusidic Acid ointment tds for 5 days, Or for MRSA only, topical mupirocin tds for 5 days.</p> <p>For more extensive infection:</p> <p>Flucloxacillin 500mg qds for 7 days or Clarithromycin 500mg bd for 7 days (if allergic to penicillin)</p> <p>Or for MRSA only: Doxycycline 200mg od on day 1 followed by 100mg od for another 6 days (i.e. 7 days in total)</p>	<p>Advise on importance of personal hygiene e.g. not to share towels, flannels etc. Avoid topical steroids or long term topical antibiotic use. Further advice may be obtained from the community infection control nurse.</p>
Cellulitis / Erysipelas	<p>Flucloxacillin 500mg qds for 7 days or</p> <p>Clarithromycin 500mg bd for 7 days if allergic to penicillin</p>	<p>Consider admission and discuss with microbiologist. Review response to treatment after 7 days. If slow response, continue for further 7 days.</p>
Facial Cellulitis	<p>Co-amoxiclav 500/125 tds for 7 days If penicillin allergic: Clarithromycin 500mg bd for 7 days</p>	
Post-operative wound infections	<p>Flucloxacillin 500mg qds for 7 days.</p> <p>Clarithromycin 500mg bd for 7 days if allergic to penicillin</p>	<p>Swab wound for culture & sensitivity Consider nature of operation and likely pathogens including MRSA status Consider hospital admission and discuss with medical microbiologist.</p>

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Boils	If cellulitis has been excluded antibiotics not indicated. Drainage is advised.	<i>(Also see recurrent boils)</i>
Recurrent boils associated with carriage of <i>Staph. aureus</i>	Topical antiseptic for one week – see page 6. Mupirocin 2% nasal ointment bd for 5 days	Swabs to confirm nasal carriage of <i>Staphylococcus aureus</i> . Ask for PVL testing to be carried out.
Leg ulcers	Flucloxacillin 500mg qds for 7 days or Clarithromycin 500mg bd for 7 days	Ulcers always colonized. Check MRSA status. Antibiotics do not improve healing unless active infection. If active infection, send pre-treatment swab. Review antibiotics after culture results. Active infection if cellulitis / increased pain/pyrexia/purulent exudate/odour Refer to wound care formulary or tissue viability nurse if available.
Infected animal bites (from non-rabies endemic areas), prophylaxis for cat bite, severe cat scratches and complicated dog bite Refer serious bites (especially in children) to AED	Co-amoxiclav 500/125 tds for 7 days or If allergic to penicillin: Doxycycline 100 mg bd for 7 days (cat/dog) plus Metronidazole 400mg tds for 7 days Children under 12 years with confirmed penicillin allergy: Clarithromycin for 7 days plus Metronidazole for 7 days. Advise to re-consult if failing to improve as prophylaxis is sub-optimal.	Adequate wound toilet is essential & the mainstay of treatment. Consider surgical debridement if required Assess rabies risk for animal bites occurring abroad. Assess tetanus immunisation status N.B. Consider risk of blood borne virus transmission. Further guidance from Public Health England

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Prophylaxis for human bite	Co-amoxiclav 500/125 tds for 7 days or if allergic to penicillin: Clarithromycin 500mg bd for 7 days plus metronidazole 400mg tds for 7 days	Adequate wound toilet is essential & the mainstay of treatment. Consider surgical debridement if required Assess HIV/Hepatitis B risk for human bites. N.B. Consider risk of blood borne virus transmission. Further guidance from Public Health England
In growing toe nail infection	Flucloxacillin 500mg qds for 7 days OR if allergic to penicillin: Clarithromycin 500mg bd for 7 days	Wound debridement. Lateral nail ablation recommended when infection settled if problem is recurrent.
Superficial skin and soft tissue infections Paronychia	Flucloxacillin 500mg qds for 7 days or Clarithromycin 500mg bd for 7 days if allergic to penicillin If infection due to MRSA, use doxycycline 100mg bd for 7 days Use sensitivity results to guide therapy.	Wound debridement if suspected foreign body and swab. Empirical antibiotic treatment
Diabetic Foot Ulcer (Grade 0 or 1)	Flucloxacillin 1g qds OR Clarithromycin 500mg bd for 7 days if allergic to penicillin	Refer to foot ulcer clinic
Herpetic lesions: a) Chicken pox / Varicella zoster	Children: antiviral treatment not recommended < 14 years Adults: If onset of rash <24h or severe pain or dense/oral rash or secondary household case or steroids or smoker consider: Aciclovir 800mg five times a day for 7 days if within 24 hours of onset of rash	Virus is highly communicable. Admit patient urgently if immunocompromised Seek advice from obstetrician for pregnant patients with chicken pox. Contacts: For babies under one month old contact microbiologist for advice. Non-immune pregnant contacts may be offered specific immunoglobulin ¹ . Contact microbiologist for advice. http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/ChickenpoxVaricellaZoster/GeneralInformation/

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
b) Shingles / Varicella zoster	Aciclovir 800mg five times a day for 7 days if within 72 hours of onset of rash Second line if compliance a problem, as ten times cost Valaciclovir 1g tds for 7days Or famciclovor 250mg tds for 7 days	Treatment not normally recommended unless over 60 years. Refer urgently if ocular involvement
c) Oral Herpes	Aciclovir 5% cream five times a day for 5 days at first sign of attack.	Cold sores do not normally require antiviral treatment. Mainstay for primary acute oral herpes stomatitis is oral fluids.
¹ VZIG is available via the Public Health Laboratories at University Hospital (Aintree or Preston)		
d) Genital Herpes		See page 29
Mastitis	Flucloxacillin 500mg qds for 14 days if clinical evidence of infection. If penicillin allergic: Erythromycin 250-500mg qds for 14 days	The most common cause of mastitis is ineffective attachment at the breast. It is essential that this is corrected otherwise the problem will persist & secondary problems may result despite antibiotic treatment
Scabies	Permethrin 5% dermal cream applied for 12 hours. Apply to whole body from neck down. Do not apply after hot bath. It is important that ALL household and sexual contacts (previous 2 months) should also be treated at the same time. Apply 2 treatments 1 week apart If allergic to permethrin, Malathion 0.5% aqueous solution, 2 applications 1 week apart	Infants/>65 require head and face application (avoiding eyes) initially. Unlicensed use in under 2 months Itch may persist for 4-6 weeks following effective treatment; Crotamiton or aqueous cream may be beneficial. Sedative antihistamines may help with nocturnal itch. Wash clothes and bedding. If patient institutionalised refer to <u>Community Infection Prevention & Control Team</u> .

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Crusted (Norwegian) Scabies	Rare. Treat as for scabies but include head and neck.	Refer to Dermatology for specialist advice including prescribing oral ivermectin (unlicensed)
Head Lice Only treat if live moving lice are found black or brown eggs, not empty white egg cases	Malathion 0.5% aqueous solution Consider wet combing, or dimeticone as alternatives to insecticide treatment	A course involves two treatments one week apart. Reinfection is more probable than treatment failure. Use different insecticides for subsequent course following treatment failure. Avoid shampoos and do not use insecticides as prophylaxis
Crab lice / Pubic lice	Malathion 0.5% aqueous solution	Apply to all hairy parts of body. Repeat after 7 days. Consider other sexually transmitted infections.
Body lice	Malathion 0.5% aqueous solution	Hot wash all clothes and bedding or dry clean

The following conditions of the skin are traditionally treated with antimicrobials but are not strictly speaking infections of non commensal organisms of the skin

<p>Acne</p> <p>a) mild</p> <p>b) moderate</p>	<p>Topical benzoyl peroxide OR Topical retinoid OR Topical antibiotic clindamycin, erythromycin</p> <p>Oxytetracycline 500mg bd for 4-6 months</p> <p>Second line: Clarithromycin 250mg bd for 4-6 months is an alternative but less effective (useful in children)</p> <p>If 2 x 6months fails REFER</p>	<p>If topical treatment ineffective or acne is moderate to severe, oral antibiotics are preferred. Consider swab in failure of clinical response. Severe acne, cases unresponsive to prolonged antibiotics, presence of scarring or psychological problems should be referred to a dermatologist.</p>
<p>Rosacea (may co-exist with acne)</p>	<p>Metronidazole cream 1% applied daily for 8 weeks</p> <p>Second line: Oxytetracycline 500mg bd for 3-6 months. Repeat courses if necessary</p> <p>OR: doxycycline 100mg od NB unlicensed; photosensitivity reported</p> <p>If any 2 x 6 months oral courses fails, REFER</p>	<p>Avoid topical benzoyl peroxide</p>

Fungal Infections

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
<p>Oral Thrush (acute pseudomembranous candidosis)</p> <p>Consider referral for dental opinion</p>	<p>Nystatin oral suspension 100,000 units qds or Miconazole oral gel 5-10 ml in the mouth after food 4 times daily, retained near oral lesions before swallowing NB must confirm patient is NOT on warfarin therapy Continue for 3 days after lesions healed.</p>	<p>Correct precipitating causes e.g. antibiotics, inhaled corticosteroids (review technique, issue spacer, advise mouth rinsing). Consider possibility of serious underlying systemic illness. Disinfect denture with sodium hypochlorite 1% solution (neat Milton).</p>
<p><u>Breast-feeding mothers</u> Consider diagnosis of oral thrush in baby if painful breast-feeding cannot be resolved. Treat nipple surface and baby's mouth simultaneously</p> <p>Ductal candidiasis (with deep breast pain)</p>	<p>Miconazole unlicensed for infants < 4 months – see page 11 for pre-term infants</p> <p>Oral Fluconazole can be used – seek Specialist advice</p>	<p>Miconazole 2% cream applied to nipple & areola after feeds. Any visible cream should be wiped away before the next feed but washing is not required.</p>
<p>Candida associated angular stomatitis / cheilitis</p> <p>Refer to dental surgeon</p>	<p>Miconazole cream 2 – 4 times daily continuing for 2 days after lesions healed</p>	<p>Commonly associated with denture stomatitis. May be seen in nutritional deficiency or HIV infection. If failure to respond to 1–2 weeks of treatment investigate the possibility of underlying disease.</p>
<p>Acute sore mouth (caused by antibiotics)</p>	<p>Nystatin oral suspension 100,000 units qds for 7 days OR Miconazole oral gel, 5-10ml qds for 7 days NB must confirm patient is NOT on warfarin therapy</p>	<p>If the mucosa is sore, some patients may not be able to tolerate lozenges</p>

Clinical diagnosis	Treatment advice	Comments and guidelines for lab testing
Dermatophyte infection of skin and hair	Terbinafine 1% cream bd for 1 – 2 weeks	Refer to dermatologist if extensive. Send skin scrapings for culture and microscopy. Commence treatment if microscopically positive and review once culture results available. Continue treatment for 7 days after lesions have healed. Apply cream beyond the margin of the lesions.
Scalp	Ketoconazole 2% shampoo. Apply twice weekly for two to four weeks plus oral Terbinafine 250mg od for 4 weeks. Seek specialist advice before considering antifungal treatment in children	Send hair and scalp scrapings for laboratory confirmation before commencing systemic therapy. Commence treatment if microscopically positive and review once culture results available. Refer to dermatologist
Fingernails	Terbinafine 250mg od for 12 weeks for superficial infection or if terbinafine inappropriate - Amorolfine 5% lacquer twice weekly for 6 months.	Send nail clippings to laboratory. Treat only if laboratory confirm infection.
Toenails	Terbinafine 250mg od for 6 months. For superficial infection or if terbinafine inappropriate - Amorolfine 5% lacquer twice weekly for 12 months.	Send nail clippings to laboratory. Treat only if laboratory confirm infection.

Children's Doses for antimicrobials recommended in this guideline

See Children's BNF <http://www.bnf.org/bnf/index.htm>

Amoxicillin	1 month – 1 year 1 – 5 years 5 - 18 years	62.5mg tds 125mg tds 250mg tds Use double dose in Otitis Media, Community Acquired Pneumonia and severe infections
Benzylpenicillin by IV or IM injection for suspected meningitis	Under 1 year 1 – 9 years 10 years and over	300mg 600mg 1.2gram
Cefalexin	1 month - 1 year 1 - 5 years 5 - 12 years 12 – 18 years	125mg bd 125mg tds 250mg tds 500mg bd or tds, increased to 1–1.5g tds or qds for severe infections
Clarithromycin	1 month – 12 years: Body-weight under 8kg Body-weight 8–11kg (1 – 2 yrs) Body-weight 12–19kg (3 – 6 yrs) Body-weight 20-29kg (7-9 yrs) Body-weight 30-40kg (10-12 yrs) 12 – 18 years	7.5mg/kg bd 62.5mg bd 125mg bd 187.5mg bd 250mg bd 250mg – 500mg bd
Co-amoxiclav	1 month – 1 year 1 – 6years 6 – 12years 12 -18 years	0.25ml/kg of 125/31 suspension tds 5ml of 125/31 suspension tds 5ml of 250/62 suspension tds One 250/125 tablet tds Use double dose in severe infection
Co-amoxiclav dose for twice daily (400/57) suspension	2 months – 2 years 2 - 6 years (13 – 21kg) 7 – 12years (22 – 40kg)	0.15ml/kg of 400/57 suspension bd 2.5ml of 400/57 suspension bd 5ml of 400/57 suspension bd
Flucloxacillin	1 month - 2 years 2 – 10 years 10 - 18 years	62.5 - 125mg qds 125 - 250mg qds 250 - 500mg qds Consider using cefalexin liquid as an alternative to flucloxacillin liquid due to very poor palatability
Metronidazole	Anaerobic infections 1 month – 2 months 2 months – 12 years 12 – 18 years Pelvic inflammatory disease 12 – 18 years Dental infections 1 – 3 years 3 – 7 years 7 – 10 years 10 – 18 years	7.5mg/kg bd 7.5mg/kg (max 400mg) tds 400mg tds 400mg bd 50mg tds 100mg bd 100mg tds 200mg – 250mg tds

Miconazole oral gel	<p>Unlicensed use under 4 months (or 5-6 months of life of an infant born pre-term)</p> <p>Neonate (oral fungal infections only)</p> <p>Child 1 month–2 years</p> <p>Child 2–6 years</p> <p>Child 6–12 years</p> <p>Child 12–18 years</p>	<p>1ml 2 – 4 times daily smeared around the mouth after feeds</p> <p>2.5ml twice daily smeared around the mouth after food</p> <p>5ml twice daily after food; retain near lesions before swallowing</p> <p>5ml 4 times daily after food;</p> <p>5–10ml 4 times daily after food;</p>
Nitrofurantoin	<p>Child 3 months–12 years</p> <p>Child 12–18 years</p>	<p>750micrograms/kg 4 times daily for 3–7 days</p> <p>50mg 4 times daily for 3–7 days; increased to 100 mg 4 times daily in severe chronic recurrent infections</p>
Nystatin oral suspension	1 month – 18 years	100,000 units qds
Phenoxymethyl-penicillin (Penicillin V)	<p>1 month - 1 year</p> <p>1 - 6 years</p> <p>6 - 12 years</p> <p>12 – 18 years</p>	<p>62.5mg qds</p> <p>125mg qds</p> <p>250mg qds</p> <p>500mg qds (max 1gram qds)</p> <p>Dose can be increased to ensure at least 12.5mg/kg in severe infection</p>
Trimethoprim treatment	<p>1 month – 12 years</p> <p>12 – 18 years</p>	<p>4mg/kg (max 200mg) bd</p> <p>200mg bd</p>
prophylaxis	<p>1month – 12 years</p> <p>12 – 18 years</p>	<p>2mg/kg (max 100mg) on</p> <p>100mg on</p>

Outpatient Parenteral Antimicrobial Therapy (OPAT)

OPAT allows medically stable patients who would otherwise be fit for discharge from hospital, to receive intravenous antibiotics at home. This service aims to promote quality of life and reduce the necessity for prolonged hospital admission.

Patients receiving OPAT will have been assessed for their suitability for the service according to strict criteria. The Consultant will retain clinical & prescribing responsibility for the management of the patient whilst they are receiving IV antimicrobials. Once the patient is switched onto an oral preparation responsibility is referred back to the GP.

Overall responsibility for monitoring and prescribing for other medical conditions remains with the supervising GP.

OPAT services vary across the Mersey area. The table below provides contact details for individual areas.

CCG	Referrals	Contact Numbers	Working Hours
Liverpool South Sefton Southport & Formby	IV Team for Liverpool & Sefton Liverpool Community Health Also via Unplanned Care Direct (UCD) for Liverpool GPs Single Point of Contact ICS Direct for Sefton GPs	(0151) 285 4696 Fax: (0151) 285 4698 0845 345 0878 0300 100 1001	08.15 – 20.00 7 days a week
Knowsley	Patients from St Helens & Knowsley Hospitals via District Nurse Liaison Patients from Aintree Hospitals & Walton Neuro via District Nurse Liaison 8.30am – 4.30pm, Saturday & Sunday Patients from Royal Liverpool & Broadgreen Hospitals please contact the Royal Matrons or the CAT team All other Centres can refer direct to the individual District Nursing Teams	0151 290 2030 Fax: 0151 290 2034 0151 529 3984 Pager: # 6188 or 6183 Saturday or Sunday: 0151 290 2030	7.30am – 4.30pm, 7 days a week 8.30am – 4.30pm, Monday to Friday 8.30-4.30 Sat/Sun

Miscellaneous

Clinical diagnosis	Treatment advice/ adult dosages	Comments and guidelines for lab testing
Bacterial meningitis / Meningococcal septicaemia Notifiable immediately to Consultant in Health Protection	If not allergic to penicillin administer Benzylpenicillin IV/IM prior to admission: < 1 year 300mg stat 1-9 years 600mg stat > 10 years 1.2g stat Admit urgently	Give IM only if venous access cannot be found. In this instance allergy means a clear history of anaphylaxis. A history of rash following penicillin is not a contraindication. Close contacts of meningococcal infection will be offered chemoprophylaxis by Consultant in Health Protection
Hepatitis a) Hepatitis A Notifiable to Consultant in Health Protection	Close contacts require prophylaxis with normal immunoglobulin, preferably after lab confirmation of the index case (acute serum sample positive for Hep A IgM) Community infection nurse will liaise with GP re vaccination of contacts. Discuss with Consultant in Health Protection	For diagnosis of acute Hepatitis A request Hepatitis A IgM & IgG tests (serology) Transmission is enteric, food/water but rarely blood. Management is supportive; adequate fluid intake and appropriate nutrition and rest. Advise patient about scrupulous hygiene.
b) Hepatitis B Notifiable to Consultant in Health Protection	As Hepatitis A: Patients without icteric illness can be missed. Raised alanine aminotransferase is a good indicator if infection suspected.	Request serology for acute Hepatitis B Transmission is blood and all other body fluids. Management as Hepatitis A Untreated will develop into chronic Hepatitis. Refer.
c) Hepatitis C Notifiable to Consultant in Health Protection	No prophylaxis REFER to Gastroenterologist or Infections Disease Specialist for drug treatments following NICE guidelines. Counselling available, to be arranged by Health Protection	To diagnose active infection: Request Hepatitis C antibody test. Repeat test to confirm a new positive. Refer if positive Transmission is via blood NB LFT will give false negatives

Antimicrobial Prophylaxis

Endocarditis

Refer to the NICE Clinical Guideline Number 64 issued in March 2008 – Prophylaxis against infective endocarditis.

<http://publications.nice.org.uk/prophylaxis-against-infective-endocarditis-cg64>

Regard people with the following cardiac conditions as being at risk of developing infective endocarditis:

- acquired valvular heart disease with stenosis or regurgitation
- valve replacement
- structural congenital heart disease, including surgically corrected or palliated structural conditions, but excluding isolated atrial septal defect, fully repaired ventricular septal defect or fully repaired patent ductus arteriosus, and closure devices that are judged to be endothelialised.
- hypertrophic cardiomyopathy
- previous infective endocarditis.

Offer people at risk of infective endocarditis clear and consistent information about prevention, including:

- the benefits and risks of antibiotic prophylaxis, and an explanation of why antibiotic prophylaxis is no longer routinely recommended the importance of maintaining good oral health.
- symptoms that may indicate infective endocarditis and when to seek expert advice.
- the risks of undergoing invasive procedures, including non-medical procedures such as body piercing or tattooing.

Do not offer antibiotic prophylaxis against infective endocarditis:

- to people undergoing dental procedures
- to people undergoing non-dental procedures at the following sites:
 - upper and lower gastrointestinal tract
 - genitourinary tract; this includes urological, gynaecological and obstetric procedures, and childbirth
 - upper and lower respiratory tract; this includes ear, nose and throat procedures and bronchoscopy

Do not offer chlorhexidine mouthwash as prophylaxis against infective endocarditis to people at risk undergoing dental procedures.

Investigate and treat promptly any episodes of infection in people at risk of infective endocarditis to reduce the risk of endocarditis developing.

Offer an antibiotic that covers organisms that cause infective endocarditis if a person at risk of infective endocarditis is receiving antimicrobial therapy because they are undergoing a gastrointestinal or genitourinary procedure at a site where there is a suspected infection.

Malaria

Malaria prophylaxis should **not** be prescribed on an NHS prescription form. Patients should be advised to purchase their medicines from a pharmacy where it often costs less than the prescription charge. Mefloquine, *Maloprim®*, *Malarone®* and doxycycline are 'prescription only medicines' which should be provided on private prescription. Where doxycycline is prescribed for chemoprophylaxis of malaria it should only be prescribed privately.

Local Community Pharmacists have access to up to date advice about appropriate regimes and can advise travellers accordingly.

The length and timing of commencement of prophylaxis is determined by the regime required. Regular GP literature also provides updated advice on the choice of antimalarials for different regions of the world. Further information is available from Liverpool School of Tropical Medicine - **0151 705 3100** or from hospital pharmacy medicines information services. Pre-travel Clinic service available by appointment but adults attending may incur a charge. Other resources are:

<http://www.nathnac.org/travel/>

<http://www.fitfortravel.nhs.uk/home.aspx>

Prophylactic medicines **do not provide absolute** protection against malaria. Personal protection against being bitten using mosquito nets, insect repellents and appropriate clothing is also important.

Current statutorily notifiable diseases and food poisoning (2010)

These infections must be reported to Public Health England (see useful contact numbers)

Acute encephalitis	Malaria
Acute meningitis	Measles
Acute poliomyelitis	Meningococcal septicaemia
Acute infectious hepatitis	Mumps
Anthrax	Plague
Botulism	Rabies
Brucellosis	Rubella
Cholera	SARS
Diphtheria	Scarlet fever
Enteric fever (typhoid or paratyphoid fever)	Smallpox
Food poisoning	Tetanus
Haemolytic uraemia syndrome (HUS)	Tuberculosis
Infectious bloody diarrhoea	Typhus
Invasive group A streptococcal disease	Viral haemorrhagic fever (VHF)
Legionnaires' disease	Whooping cough
Leprosy	Yellow fever

Members of the Pan Mersey Antimicrobial Steering Group for 2013

The guidelines were developed jointly between primary and secondary care.

The Steering Group would like to take the opportunity to thank all those in primary and secondary care who contributed to the latest review of these guidelines.

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Dr Sian Alexander White, GP, Liverpool

Please feed back any comments on any aspects of these guidelines through members of this group.

Useful Contact Numbers

Medical Microbiologists and Virologists

Contact respective hospital switchboards to obtain microbiological advice out of hours

Royal Liverpool & Broadgreen University Hospitals NHS Trust Tropical & Infectious Diseases Unit	switchboard 0151 706 2000 microbiology 0151 706 4425 0151 706 3836
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Aintree University Hospitals NHS Foundation Trust	switchboard 0151 525 5980 microbiology 0151 529 4900
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Alder Hey Children's NHS Foundation Trust	switchboard 0151 228 4811
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Southport & Ormskirk Hospital NHS Trust	switchboard 01704 547471 microbiology 01704 704173
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Lancashire Teaching Hospitals NHS Foundation Trust	switchboard 01772 716565 microbiology 01772 523116
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St Helens and Knowsley NHS Trust	switchboard 0151 426 1600 microbiology 0151430 1837
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Warrington and Halton NHS Trust	switchboard 01925 635911 microbiology 01925 662545
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Public Health England	switchboard 0844 225 1295 option 1, option 1
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Out of hours advice

For health professionals: To contact a public health professional in an emergency out of hours; in the evenings, at weekends or during bank holidays, please phone: 0151 706 2000 ask for "Public Health on call"

Liverpool School of Tropical Medicine	0151 705 3100
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Consultant in Genito-Urinary Medicine Southport & Ormskirk Hospital NHS Trust	01704 513303
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Royal Liverpool and Broadgreen University Hospitals NHS Trust	0151 706 2000 (inc. out of hours)
RLBUH Health Advisors	0151 706 2622

ENT – Aural Toilet Clinics at the following sites, by referral only:

Alder Hey Children's NHS Foundation Trust	Tel 0151 252 5206 Fax 0151 252 5301
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Southport & Ormskirk Hospital NHS Trust	Tel 01704 705227 Fax 01704 703492
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Warrington & Halton Hospitals	Tel 01925 662486
Newton Community Hospital Newton-le-Willows	Tel 01925 222731

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