Northern Ireland Management of Infection Guidelines for Primary Care 2013

For Review 2015

HSC Health and Social Care Board

HSC Public Health Agency

Department of Health, Social Services and Public Safety
www.dhsspsni.gov.uk

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Aims

- **To provide a simple best guess approach to the treatment of common infections.**
- **To promote the safe, effective and economic use of antibiotics.**
- **To minimise the emergence of bacterial resistance in the community.**

Principles of Treatment

1. These guidelines are based on the best available evidence but the decision to prescribe rests with individual practitioners.
2. These guidelines are for empirical treatment of infection; a patient's treatment may be subject to change or else discontinued upon the availability of microbiology test results.
3. As these guidelines are empiric they do not override local prescribing decisions to address local circumstances e.g. where microbiologists are aware of an emerging pattern of resistance, they can issue guidance to local prescribers on the current most appropriate antibiotic for that infection.
4. **Do not accept telephone requests for antibiotics without speaking to the patient and discourage these requests.**
5. Limit telephone consultations for antibiotics to exceptional cases.
6. **Prescribe an antibiotic ONLY when there is likely to be a clear clinical benefit.**
7. Do not prescribe antibiotics for viral sore throat or simple coughs and colds.
8. **Consider alternative measures** such as cough bottles, analgesics, decongestants or delayed prescriptions. Remember that over-the-counter (OTC) cough and cold medicines should not be used in children under 6 years of age.
9. Avoid the use of co-amoxiclav, quinolones and cephalosporins to reduce the risk of MRSA & *Clostridium difficile*.
10. Prescribe generic antibiotics whenever possible.
11. Avoid widespread use of topical antibiotics. Mupirocin must be reserved for treatment of MRSA.
12. Where empirical therapy has failed or special circumstances exist, advice can be obtained from your local microbiologist / infectious disease specialist.
13. Some antibiotics must be avoided in pregnancy and breast-feeding. When treating pregnant and breast-feeding mothers, please check the suitability of the antibiotics recommended, and choose an alternative where appropriate.
14. Where the weight of a child is available this should over-ride the age in calculating doses.

All doses are oral unless stated. All dosing regimens assume normal renal and hepatic function.
For the purposes of these guidelines, adult doses may be used for children over 12 years of age.
The majority of liquid antibiotic bottles provide enough for 5 days treatment.

Hypersensitivity Reactions to Penicillins

The most important side-effect of the penicillins is hypersensitivity which causes rashes and anaphylaxis and can be fatal. Allergic reactions to penicillins occur in 1–10% of exposed individuals; anaphylactic reactions occur in less than 0.05% of treated patients.

Patients with a history of atopic allergy (e.g. asthma, eczema, hay fever) are at a higher risk of anaphylactic reactions to penicillins. Individuals with a history of anaphylaxis, urticaria, or rash immediately after penicillin administration are at risk of immediate hypersensitivity to penicillin; these individuals should not receive a penicillin. Patients who are allergic to one penicillin will be allergic to all.

Patients with a history of immediate hypersensitivity to penicillins may also react to the cephalosporins and other beta-lactam antibiotics. If a penicillin (or another beta-lactam antibiotic) is essential in an individual with immediate hypersensitivity to penicillin then specialist advice from microbiologist / infectious disease specialist should be sought on hypersensitivity testing or using a beta-lactam antibiotic with a different structure to the penicillin that caused the hypersensitivity.

Individuals with a history of a minor rash 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, be borne in mind. Other beta-lactam antibiotics (including cephalosporins) can be used in these patients.

Patients with perceived penicillin allergy may be treated with less effective and/or more toxic antibiotics, leading to side-effects, antibiotic failure or resistance.

The reasons why a patient believes they have a penicillin allergy, the history of the perceived allergy and the nature of the allergy should be investigated. It is important to distinguish between non-allergic adverse effects and true allergic reactions.

Clostridium difficile

The use of broad-spectrum antibiotics such as cephalosporins, quinolones, co-amoxiclav and clindamycin has been associated with the rise in *Clostridium difficile* associated diarrhoea (CDAD) observed in both primary and secondary care.

CDAD is one of the key unintended consequences of often unnecessary and inappropriate antibiotic prescribing. It leads to a significant increase in morbidity, mortality and use of health-care resources.

Treatment of CDAD: see page 25

To help prevent patients developing CDAD, prescribers should:

- avoid prescribing unnecessary and/or inappropriate antibiotics
- follow the NI Management of Infection Guidelines when prescribing antibiotics empirically
- avoid prescribing the broad-spectrum antibiotics listed above (especially in patients who are at increased risk of developing CDAD. This includes patients with co-morbidities, patients with illnesses affecting their GI system and all patients aged >65 years of age)
- review empirical antibiotic treatment if causative pathogen is identified.

The use of proton-pump inhibitors (PPIs) is often a contributing factor in the development of CDAD. Review all patients treated with PPIs and discontinue treatment if appropriate.

Patients diagnosed with CDAD - discontinue any unnecessary antibiotic and/or PPI treatment.

Patients with previous history of CDAD:
Prescribers MUST ensure that any antibiotic treatment is appropriate and absolutely necessary.

Influenza

Influenza Treatment	**Annual vaccination is essential for all those at risk of influenza**. For further information on influenza vaccination - refer to the "Green Book": http://immunisation.dh.gov.uk/green-book-chapters/ **Chief Medical Officer at DHSSPSNI will inform GP practices when it is appropriate to prescribe anti-viral medication for the treatment or prophylaxis of influenza.** **In this situation:** • **Treat 'at risk' patients**, when influenza is circulating in the community and **within 48 hours** of onset or in a care home where influenza is likely. • **'At risk' patients include:** pregnant women, patients aged over 65 years, patients aged under 65 years who are at risk of developing medical complications from influenza and patients with one of the following conditions: diabetes mellitus, immunosuppression, chronic respiratory disease including asthma and COPD, chronic heart disease, chronic renal disease, chronic liver disease or chronic neurological disease. • **Previously healthy people excluding pregnant women – treatment/ prophylaxis only prescribed if patient considered at serious risk of developing serious complications from influenza.** Further information available at: http://www.hpa.org.uk/infections/topics_az/influenza/seasonal/pdfs/Treatmentflowchart.pdf

Influenza (continued)

Adults: At risk of complicated influenza **including pregnant women**	Oseltamivir 75mg	**Treatment – BD for 5 days**	**Prophylaxis – Daily for 10 days**
Adults: Severely immunosuppressed	Zanamivir 10mg (by inhalation of powder)	**Treatment – BD for 5 days**	**Prophylaxis – Daily for 10 days**
Adults: Confirmed / suspected oseltamivir resistant influenza	Zanamivir 10mg (by inhalation of powder)	**Treatment – BD for 10 days** (off-label duration)	**Prophylaxis – Daily for 10 days**
Child: At risk of complicated influenza Or Severely immunosuppressed child aged under 5	Oseltamivir 0-1month – 2mg/kg 1-3months – 2.5mg/kg 3-12months – 3mg/kg 1-13 years (<15kg) – 30mg 1-13 years (15-23kg) – 45mg 1-13 years (23-40kg) – 60mg 1-13 years (>40kg) – 75mg	**Treatment – BD for 5 days**	**Prophylaxis – Daily for 10 days**
Child (over 5 years): Severely immunosuppressed Or Confirmed/suspected oseltamivir resistant influenza	Zanamivir 10mg (by inhalation of powder)	**Treatment – BD for 5 days**	**Prophylaxis – Daily for 10 days**

Influenza (continued)

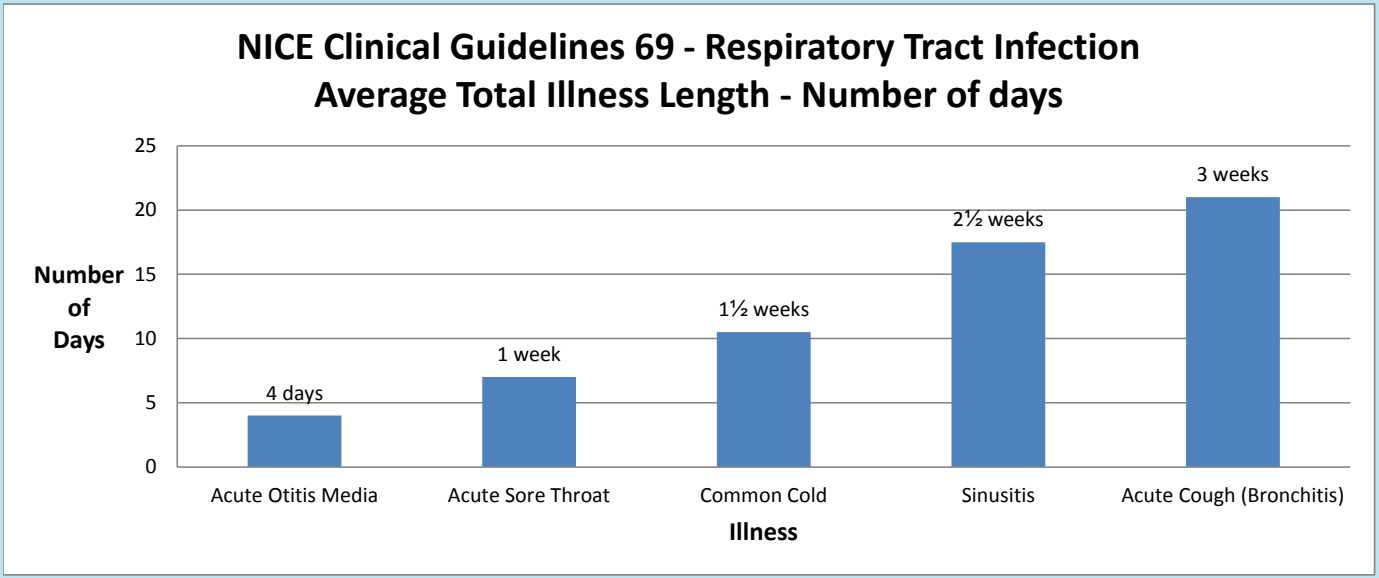
Child (under 5 years): Confirmed/suspected oseltamivir resistant influenza	Discuss with Specialist

Oseltamivir oral suspension should be used only for children under the age of one. This is an off-label use of oseltamivir supported by the BNF for children. Children > 1 year and adults with swallowing difficulties, and those receiving nasogastric oseltamivir, should use capsules which are opened and mixed into an appropriate sugary liquid.

Inhaled zanamivir – some patients are unable to inhale zanamivir (including children under 5, for whom it is unlicensed). Patients who are severely immunosuppressed and cannot take inhaled zanamivir should receive oseltamivir PO. As they are at increased risk of developing oseltamivir resistant influenza, they should be reviewed clinically to assess response to therapy. Patients who have suspected or confirmed oseltamivir resistant infection and cannot take inhaled zanamivir should receive nebulised aqueous zanamivir. This is an unlicensed medication available on a compassionate use basis for named patients in the UK and the dose is provided on the manufacturer's guidance supplied with the drug. The powder preparation for the Diskhaler should NEVER be made into nebuliser solution or administered to a mechanically ventilated patient.

Symptoms of Respiratory Tract Infections

Offer all patients advice about the usual natural history of their respiratory tract illness and the average total length of illness, NICE Clinical Guideline 69: http://guidance.nice.org.uk/CG69/QuickRefGuide/pdf/English



Upper Respiratory Tract Infections

Throat Infection/ Pharyngitis/ Tonsillitis	**The majority of sore throats are viral; most patients do not benefit from antibiotics.** Patients with 3 or more of the following Centor Criteria are more likely to benefit from antibiotics: **fever, purulent tonsils, cervical adenopathy, or absence of cough.** Those with confirmed Group A Streptococci infection should be treated for 10 days. Consider antibiotics if history of valvular heart disease, marked systemic upset, peritonsillar cellulitis or at increased risk from acute infection e.g. immunocompromised or diabetic.					
	Adult 1st line	**Penicillin V**	500mg		QDS	10 days
	Adult penicillin allergic / 2nd line	**Clarithromycin**	500mg		BD	5 - 10 days
	Child 1st line	**Penicillin V**	1 month - < 1 year	62.5mg	QDS	5 - 10 days
			1 - 6 years	125mg		
			6 - 12 years	250mg		
	Child penicillin allergic / 2nd line	**Clarithromycin***	< 8 kg	7.5mg/kg	BD	5 - 10 days
			8 - 11 kg	62.5mg		
			12 - 19 kg	125mg		
			20 - 29 kg	187.5mg		
			30 - 40 kg	250mg		
Peritonsillar Abscess	May require referral to secondary care for drainage					
Croup	No antibiotic required. Mild cases can be managed in community. More severe croup requires hospital admission and possibly steroids before transfer. See BNF.					

*Erythromycin suspension may be used as an alternative to clarithromycin suspension, as it is less expensive and its taste may be more acceptable to children.

Upper Respiratory Tract Infections						
Otitis Media	Consider symptomatic treatment in the first instance. Antibiotics are more likely to be of benefit for those under 6 months in age and those with bilateral infection.					
	Adult 1st line	**Amoxicillin**	500mg		TDS	5 - 10 days
	Adult penicillin allergic / 2nd line	**Clarithromycin**	500mg		BD	5 - 10 days
	Child 1st line	**Amoxicillin**	Child > 1 month 40mg/kg PER DAY split into 3 divided doses (max 1.5g daily in 3 divided doses)		TDS	5 - 10 days
	Child penicillin allergic / 2nd line	**Clarithromycin***	< 8 kg	7.5mg/kg	BD	5 - 10 days
			8 - 11 kg	62.5mg		
			12 - 19 kg	125mg		
			20 - 29 kg	187.5mg		
			30 - 40 kg	250mg		

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Upper Respiratory Tract Infections

Acute Otitis Externa

Systemic antibiotics are not usually required unless there are signs of associated lymphadenitis or perichondritis.
Debris in ear must be removed to allow topical medication to be absorbed effectively; this may require referral for suction removal.
Advise patient to keep ears dry and not to insert any implements into the ears.
Prescribe analgesia as this may be a painful condition.

Swab patient's ear and refer to an emergency ENT clinic if:

- Persistent discharge or pain
- Diagnostic doubt as to condition of tympanic membrane
- Immunocompromised patient
- Poorly controlled diabetic patient
- Risk of malignant otitis externa
- Patient does not respond to second-line treatment option

1st line: Adults & children > 2 years	**Otomize® Ear Spray**	1 spray	TDS	7 days
2nd line: If no response within 72 hours to 1st line therapy: Adults & children > 2 years	**Gentamicin 0.3% ear drops**	2 - 3 drops	3 - 4 times daily and at night	7 days

Upper Respiratory Tract Infections

Sinusitis

Antibiotics are not required for most people presenting with acute sinusitis.
80% will resolve in 14 days without antibiotics.
Use adequate analgesia and symptomatic relief; consider use of delayed prescription.
Further information available at:
http://cks.nice.org.uk/sinusitis

NICE recommends consideration of an immediate antibiotic prescription if patient is systemically unwell or is at high-risk of complications because of a pre-existing co-morbidity: http://www.nice.org.uk/nicemedia/live/12015/41322/41322.pdf

Red flag symptoms for sinusitis include:

- Unilateral signs (e.g. unilateral polyp or mass)
- Bleeding
- Diplopia or porptosis
- Orbital swelling or erythema
- Suspicion of intracranial or intraorbital complication
- Immunocompromised patient

Adult 1st line	**Amoxicillin or**	500mg – 1G (if severe)		TDS	7 – 10 days
	Doxycycline	100mg		BD	7 – 10 days
Adult penicillin allergic / 2nd line	**Clarithromycin**	500mg		BD	7 – 10 days
Child > 5 years 1st line	**Amoxicillin**	250mg		TDS	7 – 10 days
Child > 5 years penicillin allergic / 2nd line	**Clarithromycin***	12 - 19 kg	125mg	BD	7 – 10 days
		20 - 29 kg	187.5mg		
		30 - 40 kg	250mg		

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Lower Respiratory Tract Infections

Non-Pneumonic Lower Respiratory Tract Infection ('Acute Bronchitis')	**Antibiotics are of little benefit in otherwise healthy adults with no co-morbidities or systemic illness.** Symptom resolution can take up to 3 weeks. Consider antibiotic use in >60 years or if underlying chest disease.					
	Adult 1st line	**Amoxicillin**	500mg		TDS	5 - 10 days
	Adult penicillin allergic / 2nd line	**Clarithromycin or**	500mg		BD	5 - 10 days
		Doxycycline	100mg		BD	5 - 10 days
	Child 1st line	**Amoxicillin**	1 month - 1 year	62.5mg	TDS	5 - 10 days
			1 - 5 years	125mg		
			5 - 12 years	250mg		
	Child penicillin allergic / 2nd line	**Clarithromycin***	< 8 kg	7.5mg/kg	BD	5 - 10 days
			8 - 11 kg	62.5mg		
			12 - 19 kg	125mg		
			20 - 29 kg	187.5mg		
			30 - 40 kg	250mg		

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Lower Respiratory Tract Infections					
Acute Exacerbation of COPD	Antibiotics of unlikely benefit unless 2 or 3 of the following are increased: breathlessness, sputum volume, sputum purulence				
	Adult 1st line	**Amoxicillin**	500mg	TDS	5 – 10 days
	Adult penicillin allergic or previous exposure to amoxicillin	**Clarithromycin or**	500mg	BD	5 – 10 days
		Doxycycline	100mg	BD	5 – 10 days
	Adult with **Risk Factors** for antibiotic resistant organism: • Co-morbid disease • Severe COPD • Frequent exacerbations • Antibiotics (other than amoxicillin) in previous 3 months	**Amoxicillin**	1G	TDS	5 – 10 days

Lower Respiratory Tract Infections

Community Acquired Pneumonia

Start antibiotics immediately.
Review patients within 48 hours or earlier and if no response consider admission or discuss with microbiologist / infectious disease specialist.
Admit children < 3 months old or if vomiting or severely ill.

CRB-65 score is useful to assess severity in adults. Score 1 point for:

- Increased **C**onfusion,
- **R**espiration rate >30/min,
- **B**lood pressure systolic <90mmHg or diastolic ≤60mmHg
- Age over **65**.

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

Adult CRB-65 = 0	**Amoxicillin**	500mg	TDS	7 - 10 days
Adult CRB-65 = 0 penicillin allergic	**Clarithromycin or**	500mg	BD	7 - 10 days
	Doxycycline	100mg	BD	7 - 10 days

Lower Respiratory Tract Infections						
Community Acquired Pneumonia	Adult CRB-65 = 1 (& AT HOME)	**Amoxicillin PLUS Clarithromycin** **OR** **Amoxicillin initially and consider adding Clarithromycin after 48 hours if no improvement**	Amoxicillin 500mg TDS Clarithromycin 500mg BD			7 – 10 days
	Adult CRB-65 = 1 (& AT HOME) penicillin allergic	**Doxycycline**	100mg		BD	7 – 10 days
	Child	**Amoxicillin** (Note – BNF for children recommends high doses of amoxicillin for CAP)	1 month - 1 year	125mg	TDS	7 - 10 days
			1 - 5 years	250mg		
			5 - 12 years	500mg		
	Child penicillin allergic	**Clarithromycin***	< 8 kg	7.5mg/kg	BD	7 - 10 days
			8 - 11 kg	62.5mg		
			12 - 19 kg	125mg		
			20 - 29 kg	187.5mg		
			30 - 40 kg	250mg		

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Genito Urinary Tract Infections

Uncomplicated Urinary Tract Infection (UTI) Adult Women < 65 years

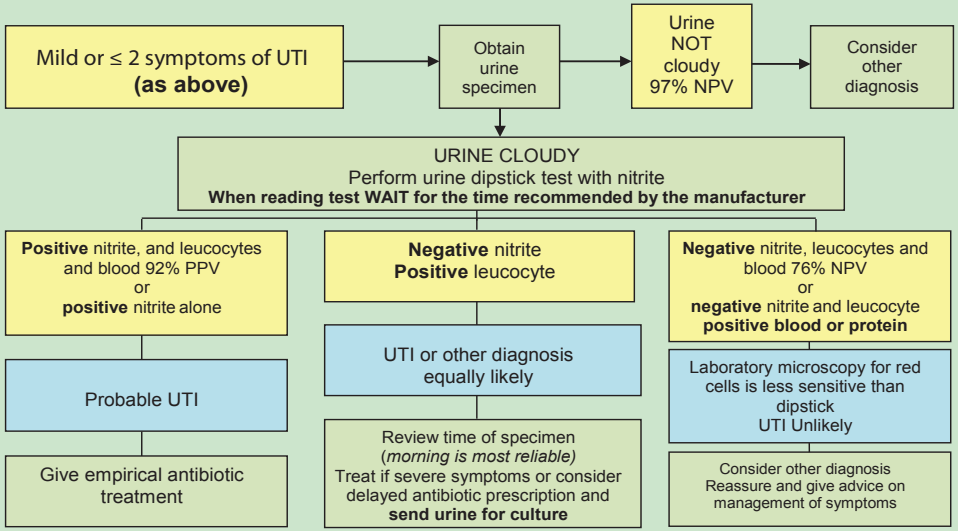
Acute uncomplicated UTI in women <65 years often resolves in a few days without treatment. Consider chlamydia in sexually active young women.

Do not routinely culture urine unless suspected pyelonephritis, failed antibiotic treatment or persistent symptoms, recurrent UTI, abnormalities of genitourinary tract, renal impairment.

Symptoms of UTI include dysuria, frequency, suprapubic tenderness, urgency, polyuria, haematuria: **Severe or ≥ 3 symptoms of UTI and NO vaginal discharge/irritation - prescribe empirical antibiotic treatment.**

Empirical Treatment

Trimethoprim or	200mg	BD	3 days
Nitrofurantoin	50mg	QDS	3 days



Genito Urinary Tract Infections

<table>
<tr><td rowspan="2">Urinary Tract Infection
Pregnant Women</td><td colspan="4">Send pre-treatment MSU for culture and sensitivity testing – indicate on laboratory request form that sample is from pregnant patient.
• Asymptomatic bacteriuria – await MSU results and treat as per sensitivities
• Symptomatic bacteriuria – commence empirical treatment with cefalexin, then deescalate treatment from cefalexin if appropriate when laboratory results are available.

Treatment choices when sensitivities are known in order of preference are amoxicillin (do not use empirically, only use if susceptible), nitrofurantoin, trimethoprim and cefalexin.
Cautions:
Nitrofurantoin – do not use at term / use with caution in third trimester.
Trimethoprim – avoid in first trimester or if patient has low folate status or is on folate antagonist e.g. antiepileptic medication.</td></tr>
<tr><td>Cefalexin
(empiric treatment)</td><td>500mg</td><td>BD</td><td>7 days</td></tr>
<tr><td rowspan="3">Recurrent Urinary Tract Infections in Women ≥ 3 UTIs/ year</td><td colspan="4">Recurrent UTI - a repeated UTI, which may be due to relapse or reinfection.
Diagnosis of recurrent UTI should be based on detection of a urinary pathogen on culture of the urine and on clinical judgement - the number of recurrences regarded as clinically significant depends on the risks of infection and the impact on the patient.
Note:
• Relapse is recurrent UTI with the same strain of organism. Relapse is the likely cause if infection recurs within a short period (for example within 2 weeks) after treatment.
• Reinfection is recurrent UTI with a different strain or species of organism. Reinfection is the likely cause if UTI recurs more than 2 weeks after treatment.</td></tr>
<tr><td>Trimethoprim
or</td><td>100mg</td><td>Nocte</td><td rowspan="2">Prophylactic use at night - take before going to bed, after emptying bladder.

Maximum treatment - 6 months, then review.</td></tr>
<tr><td>Nitrofurantoin</td><td>50 - 100mg</td><td>Nocte</td></tr>
</table>

Genito Urinary Tract Infections				
Urinary Tract Infection Adult Men < 65 years	Send a pre-treatment MSU OR if symptoms are mild/non-specific, use –ve nitrite and leucocytes to exclude UTI. Consider chlamydia in sexually active young men with urinary tract symptoms.			
	Trimethoprim or	200mg	BD	7 days
	Nitrofurantoin	50mg	QDS	7 days
Urinary Tract Infection Children	Send pre-treatment MSU. Child <3 months: refer urgently for assessment. Child ≥ 3 months: use positive nitrite to start antibiotics. Imaging: refer only if child <6 months, recurrent or atypical UTI. See NICE Guidelines for management of proven UTI in children http://www.nice.org.uk/CG54 Where infection suspected, prompt antibacterial treatment minimises renal scarring. Treat initially with trimethoprim then on basis of sensitivity.			
	Trimethoprim	Child 6 weeks – 12 years 4mg/kg (maximum 200mg) OR:		3 days (lower UTI) 7 days (upper UTI)
		6 weeks – 6 months	25mg BD	
		6 months – 6 years	50mg BD	
		6 – 12 years	100mg BD	

Genito Urinary Tract Infections

Urinary Tract Infection
Women & Men
> 65 years

Do not send urine for culture in asymptomatic patient with positive dipstick.
Do not treat asymptomatic bacteriuria, as it is very common, but is not associated with increased morbidity.

- Only send urine for culture if two or more signs of infection, especially dysuria, fever > 38 °C or new incontinence.
- Treating does not reduce mortality or prevent symptomatic episodes, but increases the chance of side effects & antibiotic resistance.

Renal Impairment a dose reduction of nitrofurantoin or trimethoprim may be required.

Trimethoprim or	200mg	BD	Females: 3 days Males: 7 days
Nitrofurantoin	50mg	QDS	Females: 3 days Males: 7 days

Catheter in situ

- Do not treat asymptomatic bacteriuria in those with indwelling catheters, as bacteriuria is very common.
- Treating with antibiotics does not reduce mortality or prevent symptomatic episodes, but increases side effects & antibiotic resistance.
- Antibiotics will not eradicate asymptomatic bacteriuria; only treat if patient is systemically unwell or pyelonephritis is likely.
- Only send urine for culture in catheterised patients if features of systemic infection. However, always:
  - Exclude other sources of infection.
  - Check that the catheter drains correctly and is not blocked.
  - Consider need for continued catheterisation.
  - If the catheter has been in place for more than 7 days, consider changing it before/when starting antibiotic treatment. (Allow patient to remain without catheter for as long as possible between removal of catheter and insertion of new catheter).
- **Do not offer prophylactic antibiotics routinely** when changing catheters in patients with long-term indwelling urinary catheters**.** Consider antibiotic prophylaxis for patients who have a history of symptomatic urinary tract infection after catheter change or patients who experience trauma during catheterisation.

Further information available at: http://guidance.nice.org.uk/CG139

Genito Urinary Tract Infections					
Sexually Transmitted Infections (STIs)	For suspected STIs, refer patients to local genitourinary clinic. Further information on STIs available at: http://www.bashh.org/guidelines				
Candidiasis (vulvo-vaginal infection)	Advise patient to consider self-referral to the community pharmacy minor ailments scheme should they experience this condition in the future. Further information available at: http://www.hscbusiness.hscni.net/services/2055.htm				
	Adult	**Clotrimazole or**	500mg pessary or 10% intravaginal cream	Stat	
		Fluconazole	150mg	Stat	
Chlamydia	Provide initial treatment, then refer onwards to local genitourinary clinic. Azithromycin - 1st line treatment choice for all females and heterosexual males. Doxycycline - consider 1st line for men who have sex with men.				
	Adult	**Azithromycin or**	1g	Stat	
		Doxycycline	100mg	BD	7 days
Bacterial Vaginosis	Adult Women	**Metronidazole or**	400mg	BD	7 days
		Clindamycin	2% intravaginal cream	Nocte	7 days

***Clostridium difficile* associated diarrhoea (CDAD)**	**Clinical diagnosis of CDAD** Patients with diarrhoea (profuse +/- blood), particularly patients aged >65 years of age who are currently on antibiotic treatment (or recent antibiotic treatment) should have a stool sample sent to laboratory for *Clostridium difficile* testing. CDAD is a toxin mediated disease. Not all strains of *Clostridium difficile* produce toxin, therefore the testing process for *Clostridium difficile* is now more complex as laboratories perform a two stage test: • Stage 1 - Glutamate dehydrogenase (GDH) test. A positive result indicates carriage of *Clostridium difficile* in the bowel. • Stage 2 – *Clostridium difficile* toxin test. A positive result indicates that *Clostridium difficile* is causing an infection and that patient may require treatment. Note: some strains of *Clostridium difficile* which are capable of producing toxin may not have done so yet. If a patient with negative toxin result continues to experience symptoms of CDAD, send another stool sample to laboratory for toxin testing. Any queries around interpretation of test results should be referred to local microbiologist. **Prevention of CDAD:** • Avoid unnecessary and/or inappropriate prescribing of antibiotics. • Avoid using broad-spectrum antibiotics such as cephalosporins, quinolones, co-amoxiclav and clindamycin (especially in patients who are at increased risk of developing CDAD. This includes patients with co-morbidities, patients with illnesses affecting their GI system and all patients aged >65 years of age). • Follow the NI Management of Infections Guidelines when prescribing antibiotics empirically. • Review empirical antibiotic treatment if causative pathogen has been identified. • The use of proton-pump inhibitors (PPIs) is often a contributing factor in the development of CDAD. Review patients treated with PPIs and discontinue treatment if appropriate.

Gastro-Intestinal Infections					
***Clostridium difficile* associated diarrhoea (CDAD)**	**Patients diagnosed with CDAD:** • Review the need for any currently prescribed antibiotic and discontinue if possible. • Stop any PPI treatment if possible. • Do not prescribe any antimotility agents or laxatives. **Patients with history of CDAD:** • Prescribers MUST ensure that any future antibiotic treatment is appropriate and absolutely necessary.				
	Adult – severe disease	Signs of severe disease include: Temperature > 38.5°C, WCC > 15 x 10^9/l, CRP > 150mg/l, rising serum creatinine, pain/tenderness and signs of severe colitis. Any patient severely unwell with CDAD - discuss case with local microbiologist / infectious disease specialist and consider urgent referral to hospital.			
	Adult – mild disease	Patient is symptomatic but does not meet any of the criteria for severe CDAD and may be managed at home depending on co-morbidity and social circumstances.			
		Metronidazole	400mg	TDS	10 - 14 days

Skin & Soft Tissue Infections					
Acne & Folliculitis	Adult 1st line topical therapy	**Benzoyl peroxide**	2.5% gel increasing to 5% if tolerated	BD	Review after 2 months
	Adult topical if benzoyl peroxide not tolerated	A topical retinoid e.g. Adapalene or Tretinoin or Isotretinoin may be used as an alternative. Benzoyl peroxide or other abrasive cleansers may cause peeling which should be given time to subside before using a topical retinoid.			
	Adult 1st line systemic therapy	**Oxytetracycline or Tetracycline or**	500mg	BD	Review in 3 months, full Rx may take 6 - 12 months
		Lymecycline	408mg	OD	
	Adult 2nd line systemic therapy	**Erythromycin or**	500mg	BD	
		Doxycycline	100mg	OD	
	Adult 3rd line systemic therapy	Refer to dermatology			

Skin & Soft Tissue Infections

Abscesses / Boils	1st line: Boils don't usually respond to antibiotics. Treat with drainage as soon as possible. **Antibiotics should only be used as an interim measure until drainage takes place. Following drainage the continuing need for antibiotics should be reassessed.**					
	Adult	**Flucloxacillin**	1G		QDS	Abscess should be drained as soon as possible
	Adult penicillin allergic	**Clarithromycin**	500mg		BD	
	Child	**Flucloxacillin**	1 month - 2 years	62.5 - 125mg	QDS	
			2 - 10 years	125 - 250mg		
			10 - 12 years	250 - 500mg		
	Child penicillin allergic	**Clarithromycin***	< 8 kg	7.5mg/kg	BD	
			8 - 11 kg	62.5mg		
			12 - 19 kg	125mg		
			20 - 29 kg	187.5mg		
			30 - 40 kg	250mg		

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Skin & Soft Tissue Infections

Cellulitis / Impetigo	Serious or deteriorating cellulitis is an emergency and will need referral for IV antibiotics. **Bacteria are always present in leg ulcers, antibiotics do not improve healing.** Use antibiotics only if cellulitis, increasing pain, enlarging ulcer or pyrexia. Contact microbiologist / infectious disease specialist if river or sea water exposure					
	Adult 1st line	**Flucloxacillin**	500mg - 1G		QDS	7 - 14 days
	Adult penicillin allergic / 2nd line	**Clarithromycin**	500mg		BD	7 - 14 days
	Child 1st line	**Flucloxacillin**	1 month – 2 years	62.5 - 125mg	QDS	7 - 14 days
			2 - 10 years	125 - 250mg		
			10 - 12 years	250 - 500mg		
	Child penicillin allergic / 2nd line	**Clarithromycin***	< 8 kg	7.5 mg/kg	BD	7 - 14 days
			8 - 11 kg	62.5mg		
			12 - 19 kg	125mg		
			20 - 29 kg	187.5mg		
			30 - 40 kg	250mg		

*Erythromycin suspension may be used as an alternative to clarithromycin suspension, as it is less expensive and its taste may be more acceptable to children.

Skin & Soft Tissue Infections							
Bites - Human	Surgical toilet is most important. Assess tetanus risk. Antibiotic prophylaxis advised for all human bites. Also assess HIV / hepatitis B and C risk.						
	Adult 1st line	**Co-amoxiclav**	625mg			TDS	7 days
	Adult penicillin allergic / 2nd line	**Metronidazole PLUS**	400mg			TDS	7 days
		Doxycycline	100mg			BD	
	Child 1st line	**Co-amoxiclav**	1 month – 1 year	0.25mL/kg of 125/31 suspension		TDS	7 days
			1 - 6 years	5mL of 125/31 suspension			
			6 - 12 years	5mL of 250/62 suspension			
	Child penicillin allergic / 2nd line	**Clarithromycin* PLUS**	< 8 kg	7.5mg/kg		BD	7 days
			8 - 11 kg	62.5mg			
			12 - 19 kg	125mg			
			20 - 29 kg	187.5mg			
			30 - 40 kg	250mg			
		Metronidazole	1 – 2 months	7.5mg/kg	BD		7 days
			2 months – 12 years	7.5mg/kg (Max 400mg)	TDS		

*Erythromycin suspension may be used as an alternative to clarithromycin suspension, as it is less expensive and its taste may be more acceptable to children.

Skin & Soft Tissue Infections

Bites – Animal

Surgical toilet is most important. Assess tetanus and rabies risk.
Antibiotic prophylaxis advised for puncture wounds and bites involving hand, foot, face, joint, tendon, ligament; immunocompromised, diabetic, elderly, cirrhotic or asplenic patients.

Note: Clarithromycin does not work for animal bites.

Adult 1st line	**Co-amoxiclav**	625mg		TDS	7 days
Adult penicillin allergic / 2nd line	**Metronidazole PLUS**	400mg		TDS	7 days
	Doxycycline	100mg		BD	
Child 1st line	**Co-amoxiclav**	1 month – 1 year	0.25mL/kg of 125/31 suspension	TDS	7 days
		1 – 6 years	5mL of 125/31 suspension		
		6 – 12 years	5mL of 250/62 suspension		
Child penicillin allergic / 2nd line	Where a child who has been bitten by an animal is genuinely penicillin allergic and requires antibiotic prophylaxis - consult your local microbiologist / infectious disease specialist for advice. Clarithromycin does not work for animal bites.				

Skin & Soft Tissue Infections

Athlete's Foot (Tinea Pedis)	Advise patient to consider self-referral to the community pharmacy minor ailments scheme should they experience this condition in the future. Further information available at: http://www.hscbusiness.hscni.net/services/2055.htm				
	Adult and Child	**Clotrimazole**	1% Cream 20g	BD - TDS	Use for 2 weeks after area has healed
		Miconazole	2% Cream 30g	BD	Continue for 10 days after area has healed
Fungal Nail Infections (Onychomycosis)	Send nail clippings to laboratory for testing: start therapy only if infection is confirmed by laboratory. Use terbinafine first line, but if candida or non-dermatophyte infection confirmed, use oral itraconazole. For children, seek specialist advice.				
	Adults – Superficial only	**Amorolfine**	5% nail lacquer	1 - 2 times weekly	6 months (finger nails) 9 - 12 months (toe nails)
	Adults – 1st line	**Terbinafine**	250mg	Daily	6 – 12 weeks (finger nails) 3 – 6 months (toe nails)
	Adults – 2nd line	**Itraconazole**	200mg	BD	7 days per month, subsequent courses repeated after 21 days 2 courses (finger nails) 3 courses (toe nails)

Skin & Soft Tissue Infections					
Fungal Skin Infections	Patients with fungal skin infections in the groin area may obtain advice and treatment via the community pharmacy minor ailment scheme. Advise patient to consider self-referral to the scheme should they experience this condition in the future. Further information available at: http://www.hscbusiness.hscni.net/services/2055.htm				
	Adults	**Terbinafine**	1% cream	BD	1 - 2 weeks
	Adults if candida possible	**Miconazole**	2% cream	BD	2 weeks (continue for 1 - 2 weeks after area has healed)
	Adults – systemic treatment for intractable conditions only (skin scrapings sent to laboratory and infection confirmed)	**Terbinafine**	250mg	Daily	4 weeks
	Children	**Miconazole**	2% cream	BD	2 weeks (continue for 1 - 2 weeks after area has healed)

Viral Skin Infections

Shingles

Offer non-immunocompromised patients appropriate analgesia and local skincare advice to prevent secondary bacterial infection.

Treat:
- If patient is over 50 years of age and within 72 hours of rash
- Active ophthalmic shingles
- Ramsey Hunt Syndrome
- Eczema

Seek urgent specialist advice: for management of high-risk patients following significant exposure to shingles or chicken pox. Post-exposure management is to protect individuals at high-risk of suffering severe varicella and those who may transmit infection to those at high-risk. High-risk patients include:
- Pregnant women
- Immunocompromised patients
- Neonates

For further information on varicella vaccination and post-exposure management – refer to the "Green Book":
http://immunisation.dh.gov.uk/green-book-chapters/chapter-34/

Adults 1st line	**Aciclovir**	800mg	Five times a day	7 days
Adults 2nd line	**Valaciclovir**	1G	TDS	7 days

Eye Infections				
Conjunctivitis	1st line: Treat only if severe, as most are viral or self-limiting. Bacterial conjunctivitis is usually unilateral and also self-limiting – it is characterised by red eye with mucopurulent, not watery, discharge. Ointment stays in the eye longer and therefore is a good night-time treatment option, however due to blurring of vision, drops may be more acceptable to some patients during day.			
	Adults & children >1month - if severe	**Chloramphenicol 0.5% drops and/or 1% ointment**	Use every 3 hours	Use for 48 hours after resolution

Dental Infections Presenting in General Practice

GPs should not routinely be involved in dental treatment. Dental infections should be assessed by a qualified dental practitioner as soon as possible.
An antibiotic prescription is a temporary measure which should only be provided when clinically indicated and by someone who feels competent to assess the problem.

Out-of-hours dental treatment is appropriate in the following situations: severe swelling, intractable pain, bleeding, and trauma.

*Information on the availability of out-of-hours dental services is detailed below or alternatively may be accessed at: http://www.gpoutofhours.hscni.net/Emergency%20Dental%20Services.html

Area	Contact Details
Greater Belfast Area	**Relief of Dental Pain Service -** Dental Out-patients Department, Belfast City Hospital **Telephone number:** 028 9026 3992 **Monday to Friday:** Clinic opens at 7.00pm **Saturday, Sunday and Bank Holidays:** Clinic opens at 10.00am, 2.30pm and 7.00pm (The first 15 patients to arrive at each clinic will be seen)
Northern Trust Area	**Relief of Dental Pain Clinic -** Dalriada Urgent Care Centre, Ballymena **Telephone number:** 028 2566 3510 **Monday to Friday:** Clinic opens 6.30pm – 9.30pm **Saturday, Sunday and Bank Holidays:** Clinic opens 9.30am – 12.30pm
Southern Trust Area	**Emergency Dental Clinic -** Craigavon Area Hospital **Telephone number:** 028 3861 2292 **Monday to Friday:** Clinic opens 7.00pm – 9.00pm **Saturday & Sunday:** Clinic opens 10.00am – 12 noon
Western Trust Area	Phone own dentist and details of local out-of-hours arrangements will be available on the answering machine.

*Information accurate at time of publication.

Dental Infections Presenting in General Practice					
Dental Abscess	Advise urgent dental consultation as dental abscess is treated in the first instance by drainage and repeated courses of antibiotics are not appropriate. Antibiotics are only recommended if there are signs of severe infection, systemic symptoms or high risk of complications. Otherwise regular analgesia should be first option until a dentist can be seen. **In severe spreading infection (cellulitis, lymph node involvement or swelling) or systemic involvement (pyrexia, malaise) a combination of amoxicillin and metronidazole can be used and referral to hospital considered.** **If obstruction of the airways is possible, urgent referral to hospital is required.**				
	Adult 1st line	**Amoxicillin**	500 mg	TDS	5 days
	Adult 2nd line	**Metronidazole**	200 - 400mg	TDS	5 days
Other dental conditions	Advise dental consultation for treatment of other dental infections including acute necrotising gingivitis, pericoronitis and mucosal inflammation or ulceration. See BNF for treatment information if necessary.				

Meningitis

Transfer all patients to hospital immediately
Administer antibiotic STAT while arranging transfer
Treatment should ideally be administered IV

1st line: Benzylpenicillin IV/IM	
Child < 1 year	300mg
Child 1-9 years	600mg
Adult & Child > 10 years	**1.2G**

Penicillin allergic: Cefotaxime IV/IM		
Do not use cefotaxime in patients with history of immediate hypersensitivity reaction to penicillin - use IV chloramphenicol – if this is not available, refer patient urgently to hospital.		
Adults	**1G**	
Child	**Child (1 month-12 years) 50mg/kg** Where weight of a child is available, this should over-ride age in calculating dose	
Age	Approx Weight	Dose
1 month	9lbs or 4kg	200mg
3 months	13lbs / 6kg	300mg
6 months	18lbs/ 8kg	400mg
12 months	22lbs/ 10kg	500mg
3 years	2st5lbs/ 15kg	750mg
6 years	3st2lbs/ 20 KG +	1G