



# Guidelines For Antimicrobial Prescribing In Primary Care In Ireland

November 2011

A Strategy for the Control of  
Antimicrobial Resistance in Ireland

S A R I

**HE** Feidhmeannacht na Seirbhíse Sláinte  
Health Service Executive





# Management of Infection Guidance for Primary Care In Ireland – November 2011

## Background

Antimicrobial resistance is recognised as a significant threat to public health by compromising our ability to treat infections effectively. It is widely acknowledged that antibiotic resistance is driven by high rates of antibiotic prescribing.

The continuing problem of antimicrobial resistance has prompted efforts to reduce unnecessary antibiotic use to maximise the lifespan of these valuable drugs and to strive to prevent a return to the “pre-antibiotic” era.

Evidence-based antimicrobial guidelines are a key tool in efforts to improve antibiotic prescribing, reduce the progression of antibiotic resistance and optimise patient outcomes.

These guidelines were developed by the Community Antimicrobial Stewardship subcommittee of the SARI National Committee. With the advent of the RCPI /HSE clinical programme on healthcare-associated infection and antimicrobial resistance, the SARI committee(s) agreed to complete its work and hand over its functions to a new committee. A new national committee was established in September 2011 under the governance of the Royal College of Physicians in Ireland (RCPI); the RCPI Clinical Advisory Group on Healthcare-associated Infection. This committee has taken over the functions of the SARI National Committee. Dr. Nuala O’ Connor represents the ICGP on the RCPI Clinical Advisory Group.

These guidelines may be used for consultation and local adaptation.

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## Table of Contents

	Page
Aims	3
Principles of Antimicrobial Treatment	3
Upper Respiratory Tract Infections	4
Lower Respiratory Tract Infections	6
Influenza	7
Meningitis	7
Urinary Tract Infections	8
Gastrointestinal Infections	9
Genital Tract Infections	10
Skin and Soft Tissue Infections	11
Prescribing for Children	14
Diagnosis and Management of Urinary Tract Infection in Long Term Care Residents over 65 years	15

## Aims

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

## Principles of Antimicrobial Treatment

1. This guidance is based on the **best available evidence** but its application must be modified by professional judgement.
2. A dose and duration of treatment is suggested. In severe or recurrent cases consider a larger dose or longer course
3. Prescribe an antibiotic **only** when there is likely to be a clear **clinical benefit**.
4. Consider a **no**, or **delayed**, antibiotic strategy for acute sore throat, common cold, acute cough and acute sinusitis.
5. Limit prescribing over the telephone to exceptional cases.
6. **Try to avoid over-use of broad spectrum antibiotics** (eg co-amoxiclav, quinolones and cephalosporins) as this can increase risk of **penicillin non-susceptible pneumococci**, *Clostridium difficile*, MRSA and resistant urinary tract infection (UTIs) and also limit the future usefulness of these important agents. Consider use of **narrow spectrum agents** (e.g. penicillin, amoxicillin, flucloxacillin, trimethoprim) as outlined in these guidelines for specific indications where clinically appropriate.
7. **Note:** Hospital antibiotic guidelines can differ from community guidelines as patients are generally systemically unwell when hospitalised and may require intravenous and/or broader spectrum agents due to possible recent exposure to antibiotics in the community and/or failed initial therapy and increased severity of illness.
8. **Avoid** widespread use of **topical** antibiotics (especially those agents also available as systemic preparations, e.g. fusidic acid).
9. In pregnancy **AVOID** tetracyclines, quinolones and *high dose* metronidazole (2g). Short-term use of trimethoprim (unless low folate status or taking another folate antagonist such as antiepileptic or proguanil) or nitrofurantoin (at term, theoretical risk of neonatal haemolysis) is unlikely to cause problems to the foetus.
10. Clarithromycin has fewer side-effects than erythromycin. However, erythromycin is preferable to clarithromycin if patient is on warfarin. Clarithromycin has a greater potential for raising INR. *Note, spectrum of activities of these drugs not identical.* Exercise caution when considering concomitant administration of macrolides and statin therapy due to potential risk of rhabdomyolysis.
11. Where a 'best guess' therapy has failed or special circumstances exist, seek microbiological advice.

# UPPER RESPIRATORY TRACT INFECTIONS:

Consider delayed antibiotic prescriptions.<sup>A-</sup>

Illness	Comments		Treatment	Dose	TX Duration
<p><b>Pharyngitis / sore throat / tonsillitis</b></p>	<ol style="list-style-type: none"> <li><b>The majority of sore throats are viral; most patients do not benefit from antibiotics.</b> Consider a delayed antibiotic strategy and explain soreness will take about 8 days to resolve. Patients with 3 of 4 centor criteria (history of fever, purulent tonsils, cervical adenopathy, absence of cough) or history of otitis media may benefit more from antibiotics.<sup>A-</sup> Antibiotics only shorten duration of symptoms by 8 hours.<sup>A+</sup></li> <li>Antibiotics to prevent otitis media NNT 200,<sup>A+</sup> Quinsy NNT &gt;4000.<sup>B-</sup></li> <li>Penicillin for 7 days is more effective than 3 days.<sup>B+</sup> Twice daily higher dose can also be used.<sup>A-</sup> QDS may be more appropriate if severe.<sup>D</sup></li> <li>Phenoxymethylpenicillin suspension is available in two flavours; Calvepen® (caramel) and Kopen® (orange).</li> </ol>	<p><b>Symptomatic relief</b> Discomfort on swallowing – lozenges containing benzocaine or flurbiprofen Sore, 'tickly' throat – demulcent pastilles Sucking a lozenge or pastille promotes saliva production which lubricates &amp; soothes the throat. Main disadvantage; high sugar content though sugar-free preparations are available. Local analgesia- anti-inflammatory spray or mouthwash (e.g. benzydamine)</p>	<p><b>Consider a no or delayed antibiotic strategy.<sup>A+</sup></b> If antibiotics deemed clinically indicated:</p> <p><i>first line (Adults)</i> phenoxymethylpenicillin clarithromycin <i>if allergic to penicillin</i></p> <hr/> <p><i>first line (Children)</i> phenoxymethylpenicillin suspension (250mg /5ml)  erythromycin  OR  clarithromycin <i>if allergic to penicillin</i></p>	<p>333-666 mg QDS 250-500 mg BD</p> <hr/> <p>&lt; 1 yr 62.5mg QDS 1-5 yrs 125mg QDS 6-12 yrs 250mg QDS</p> <p>&lt; 2 yrs 125mg QDS 2-8 yrs 250mg QDS</p> <p>&lt; 1 yr 62.5mg BD 1-5 yrs 125mg BD 5-12yrs 250mg BD</p>	<p>10 days 5 days</p> <hr/> <p>7-10 days</p> <p>5 days</p>

<p><b>Otitis media (child doses)</b></p>	<ol style="list-style-type: none"> <li>1. Many are viral. Illness resolves over 4 days in 80% without antibiotics.<sup>A+</sup></li> <li>2. Antibiotics do not reduce pain in first 24 hours, subsequent attacks or deafness.<sup>A+</sup></li> <li>3. Need to treat 20 children &gt;2y and seven 6-24m old to get pain relief in one at 2-7 days.<sup>A+B+</sup></li> <li>4. Children with otorrhoea, or &lt;2years with bilateral acute otitis media, have greater benefit but are still eligible for delayed prescribing.<sup>A+</sup></li> <li>5. Haemophilus is an extracellular pathogen, thus macrolides, which concentrate intracellularly, are less effective treatment.</li> <li>6. Antibiotics to prevent mastoiditis NNT&gt;4000.<sup>B</sup></li> </ol>	<p><b>Symptomatic relief</b> Use NSAID or paracetamol.<sup>A+</sup></p>	<p><b>Consider a no or delayed antibiotic strategy.<sup>A+</sup></b> If antibiotics deemed clinically indicated</p> <p><i>first line</i> amoxicillin</p> <p>erythromycin</p> <p>OR clarithromycin <i>if allergic to penicillin</i></p> <p><i>second line</i> co-amoxiclav</p>	<p>40 mg/kg/day in 3 divided doses (Maximum 1g TDS)</p> <p>&lt; 2 yrs 125mg QDS 2-8 yrs 250mg QDS</p> <p>&lt; 1 yr 62.5mg BD 1-5 yrs 125mg BD 5-12yrs 250mg BD</p> <p>&lt; 1 yr max 68mg TDS 1-6 yrs 156mg TDS 6-12 yrs 312 mg TDS</p>	<p>5 days</p>
<p><b>Acute Sinusitis</b></p>	<ol style="list-style-type: none"> <li>1. Many are viral. Symptomatic benefit of antibiotics is small.</li> <li>2. 80% resolve in 14 days without antibiotics and they only offer marginal benefit after 7 days (NNT 15).<sup>A+</sup></li> <li>3. Reserve for severe<sup>B+</sup> or symptoms (&gt;10 days).</li> <li>4. Cochrane review concludes that amoxicillin and phenoxymethylpenicillin have similar efficacy to the other recommended antibiotics.</li> <li>5. In persistent infection use an agent with anti-anaerobic activity e.g. co-amoxiclav.<sup>B+</sup></li> </ol>	<p><b>Symptomatic relief</b> Use NSAID or paracetamol<sup>B+</sup> Systemic decongestants: pseudoephedrine Improve air circulation &amp; mucus drainage Saline preparations for local irrigation (e.g. nasal rinses, sprays, drops) Topical decongestants: oxymetazoline, xylometazoline Suitable for most patient groups (hypertensive, diabetes, pregnant women post first trimester) Topical route should not be used &gt;7 days due to rebound congestion</p>	<p><b>Consider a no or delayed antibiotic strategy.<sup>A+</sup></b> If antibiotics deemed clinically indicated:</p> <p>amoxicillin<sup>A+</sup></p> <p>OR</p> <p>doxycycline</p> <p>OR</p> <p>clarithromycin <i>if allergic to penicillin</i></p> <p><i>second line:</i> co-amoxiclav</p>	<p>500 mg TDS</p> <p>200 mg stat/100 mg OD</p> <p>250-500mg BD</p> <p>625 mg TDS</p>	<p>7-10 days</p>

Note: Doses are oral and for adults unless otherwise stated. Please refer to BNF/BNFC/MIMS/Product SPC for further information (Refer to page 14 for guidance on dosing in children). Letters indicate strength of evidence range from A+ (systematic review) to D (informal opinion).

# LOWER RESPIRATORY TRACT INFECTIONS

**Note:**

**Avoid tetracyclines in pregnancy.**

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

The quinolones ciprofloxacin and ofloxacin have poor activity against pneumococci.

However, they do have use in PROVEN pseudomonal infections. Moxifloxacin and Levofloxacin has some anti-Gram-positive activity but should not be needed as first line treatment.

Illness	Comments		Treatment	Dose	TX Duration
<p><b>Acute cough, bronchitis (in otherwise healthy adults &amp; children)</b></p>	<p>In primary care, antibiotics have marginal benefits in otherwise healthy adults.<sup>A+</sup></p> <p>Patient leaflets can reduce antibiotic use.<sup>B+</sup></p>	<p><b>Symptomatic relief</b> Cough expectorants: guaifenesin Mucolytic agent: carbocisteine</p> <p>Cough suppressants: dextromethorphan Codeine containing products should be used with care due to dependence potential</p>	<p><b>Consider no antibiotics where possible.<sup>A+</sup></b></p> <p>If antibiotics deemed clinically indicated:</p> <p>amoxicillin OR doxycycline</p>	<p>500 mg TDS 200 mg stat/100 mg OD</p>	<p>5 days</p>
<p><b>Acute exacerbation of COPD</b></p>	<p>30% viral, 30-50% bacterial, rest undetermined. Use antibiotics if increased dyspnoea and increased purulence of sputum volume.<sup>B+</sup> In penicillin allergy use clarithromycin if doxycycline contraindicated.</p> <p><i>If clinical failure to first line antibiotics, previous amoxicillin exposure &lt;3 month, or severe symptoms (also consider hospital referral).</i></p>		<p>amoxicillin OR doxycycline</p> <p>OR clarithromycin</p> <p>co-amoxiclav</p>	<p>500 mg TDS 200mg stat/100mg OD</p> <p>250 – 500 mg BD</p> <p>625 mg TDS</p>	<p>5 days</p>
<p><b>Community-acquired pneumonia treatment in the community (Adults)</b></p>	<p><b>Start antibiotics immediately.<sup>B</sup></b> If no response in 48 hours consider admission or add a macrolide first line or a tetracycline<sup>C</sup> to cover Mycoplasma infection (rare in over 65s).</p> <p>Assess using the CRB-65 score (Confusion, Respiratory rate <math>\geq</math> 30/min, BP <math>\leq</math>90/60, Age <math>\geq</math> 65) Score 0: suitable for home treatment; Score 1-2: consider hospital referral; Score 3-4: urgent hospital admission.</p> <p>Consider adding macrolide if CRB-65=1 and suitable for home treatment (HPA guidance). In severely ill give parenteral benzylpenicillin before admission<sup>C</sup> and seek risk factors for Legionella and Staph.aureus infection.<sup>D</sup></p>		<p>amoxicillin</p> <p>OR</p> <p>clarithromycin</p> <p>doxycycline</p>	<p>500 mg - 1g TDS</p> <p>500 mg BD</p> <p>200 mg stat/100 mg OD</p>	<p>Up to 10 days</p>

# INFLUENZA

## Illness

### Seasonal Influenza

## Comments

When influenza A or B is circulating in the community, antiviral therapy should be considered for influenza-like illness in patients who are very ill or who are in recognised risk groups for severe influenza.

For otherwise healthy adults antivirals not generally recommended.

Further details on management of seasonal influenza are available from [www.hpsc.ie](http://www.hpsc.ie)

See BNF/BNFC and [hpsc.ie](http://hpsc.ie) for updates on recommendations for antiviral therapy and chemo-prophylaxis in defined risk groups.

## Treatment

### Defined Risk Groups for Antivirals

- Children aged < 2 years
- Pregnant women
- Severely obese people (BMI≥40)
- Children with any condition (e.g. cognitive dysfunction, spinal cord injury, seizure disorder or other neuromuscular disorder) that may compromise respiratory function, especially those attending special schools/day centres.

Those with:

- Chronic respiratory disease including people on medication for asthma
- Chronic heart, kidney, liver or neurological disease
- Immunosuppression (whether due to disease or treatment)
- Diabetes Mellitus
- Haemoglobinopathies

## Dose

1st line:  
Oseltamivir  
Adult-75mg bd  
75mg od

## TX Duration

5 days (treatment)  
10 days  
(chemo-prophylaxis)

*Child - Seek specialist advice if necessary*  
Oseltamivir

Treatment (5 days)  
Less than 15kg: 30mg BD  
15-23 kg: 45mg BD  
23-40kg: 60mg BD  
Over 13yrs or over 40Kg: same as adult.

Chemo-prophylaxis (10 days)  
Less than 15kg: 30mg OD  
15-23 kg: 45mg OD  
23-40kg: 60mg OD  
Over 13yrs or over 40Kg: same as adult.

2nd line: Adults and Children > 5 yrs  
Zanamivir - See BNF for dosage

# MENINGITIS

### Suspected meningococcal disease

**Transfer all patients to hospital immediately.** Administer benzylpenicillin prior to admission, unless history of anaphylaxis,<sup>B</sup> NOT allergy. Ideally IV but IM if a vein cannot be found.  
Prevention of secondary case of meningitis: **Only prescribe following advice from Public Health Doctor.**

IV or IM benzylpenicillin

Adults and children  
10 yr and over: 1200 mg  
Children 1 - 9 yr: 600 mg  
Children <1 yr: 300 mg

Note: Doses are oral and for adults unless otherwise stated. Please refer to BNF/BNFC/MIMS/Product SPC for further information (Refer to page 14 for guidance on dosing in children). Letters indicate strength of evidence range from A+ (systematic review) to D (informal opinion).

# URINARY TRACT INFECTIONS

Illness	Comments	Treatment	Dose	TX Duration			
<b>Adult- Uncomplicated UTI ie no fever or flank pain</b>	<p>Use urine dipstick to exclude UTI -ve nitrite and leucocyte 95% negative predictive value.</p> <p><b>Note: Choice of empirical therapy should be governed by local resistance rates where available. Patterns can vary substantially across the country</b></p> <p>For first presentations, low risk of resistant organisms in uncomplicated UTI consider narrow-spectrum antibiotics that concentrate in the bladder such as trimethoprim or nitrofurantoin in the first instance. There is less relapse with trimethoprim than cephalosporins. Community multi-resistant <i>E. coli</i> with <u>Extended-spectrum Beta-lactamase enzymes</u> are increasing so perform culture in all treatment failures. ESBLs are multi-resistant but remain sensitive to nitrofurantoin. Nitrofurantoin should be avoided in renal impairment due to inadequate urine concentrations.</p>	<p><b>Information on local antibiotic resistance rates in urinary pathogens is particularly important as patterns can vary substantially across the country.</b></p> <table border="1" data-bbox="911 325 1544 412"> <tr> <td data-bbox="911 342 1158 395">trimethoprim<sup>B+</sup> OR nitrofurantoin<sup>A-</sup></td> <td data-bbox="1179 342 1378 395">200 mg BD 50-100 mg QDS</td> <td data-bbox="1398 342 1544 395">3 days<sup>B+</sup> 7 days in men</td> </tr> </table> <p><b>Consider the following agents also for empiric therapy where appropriate - based on local resistance rates.</b> cephalexin, co-amoxiclav</p> <p>(For uncomplicated UTI reserve quinolones for resistant infections with limited option and confirmed by results of culture and sensitivity).</p>			trimethoprim <sup>B+</sup> OR nitrofurantoin <sup>A-</sup>	200 mg BD 50-100 mg QDS	3 days <sup>B+</sup> 7 days in men
trimethoprim <sup>B+</sup> OR nitrofurantoin <sup>A-</sup>	200 mg BD 50-100 mg QDS	3 days <sup>B+</sup> 7 days in men					
<p><b>UTI &gt;65 in Long Term Care Residents Refer to 'Diagnosis &amp; Management of Urinary Tract Infection (UTI) in Long Term Care Residents &gt;65' (page 15).</b></p>							
<b>UTI in pregnancy</b>	<p>Send MSU for culture. Short-term use of trimethoprim or nitrofurantoin in pregnancy is unlikely to cause problems to the foetus.<sup>B+</sup>Avoid trimethoprim if low folate status or taking folate antagonist (e.g. antiepileptic or proguanil). <b>Refer to local resistance patterns for empiric therapy where available and refer to MSU results.</b></p>	<p>amoxicillin OR cephalexin <i>second line</i> nitrofurantoin OR trimethoprim</p>	<p>250 mg TDS 500 mg BD  50 mg – 100 mg QDS 200 mg BD</p>	<p>7 days</p>			
<b>UTI in Children</b>	<p>Refer children &lt;3 months to specialist. Send MSU in all for culture &amp; susceptibility. If ≤ 3 years, use positive nitrite to start antibiotics. Refer children &lt;3 years post UTI for imaging.  Upper UTI</p>	<p>trimethoprim OR nitrofurantoin OR cefalexin If susceptible, amoxicillin,  co-amoxiclav</p>	<p>See BNFC For dosages</p>	<p>Lower UTI 3 days  Upper UTI 7-10 days</p>			
<b>Acute pyelonephritis</b>	<p>Send MSU for culture. RCT shows 7 days ciprofloxacin was as good as 14 days co-trimoxazole.<sup>A-</sup> If no response within 24 hours admit.</p>	<p>ciprofloxacin<sup>A-</sup> co-amoxiclav If susceptible, trimethoprim</p>	<p>500 mg BD 500/125 mg TDS 200 mg BD</p>	<p>7 days<sup>A-</sup> 14 days 14 days</p>			
<b>Recurrent UTI women ≥ 3/yr</b>	<p>If ≥ 3 episodes /yr consider post-coital prophylaxis or standby antibiotic <sup>B+</sup> Nightly: reduces UTIs but side effects (antibiotics).</p>	<p>nitrofurantoin OR trimethoprim</p>	<p>50 mg 100 mg</p>	<p>Stat post-coital (off-label) OR OD at night</p>			

# GASTRO-INTESTINAL TRACT INFECTIONS

<b>Eradication of <i>Helicobacter pylori</i></b>	<p>Eradication is beneficial in DU, GU and low grade MALTOMA, but NOT in GORD.<sup>A</sup> In NUD, 8% of patients benefit.</p> <p>Triple treatment attains &gt;85% eradication.<sup>A+</sup> Do not use clarithromycin or metronidazole if used in the past year for any infection.<sup>A+</sup></p>	<p><i>first line</i><sup>A+</sup> PPI PLUS clarithromycin AND metronidazole (MZ) OR amoxicillin (AM)</p>	<p>250 mg BD with MZ, 500mg BD with AM 400 mg BD 1g BD</p>	<p>All for 7 days<sup>A</sup>  14 days in relapse or maltoma</p>
<b>Managing symptomatic relapse</b>	<p>DU/GU: Retest for helicobacter if symptomatic</p> <p>NUD: Do not retest, treat as functional dyspepsia.</p> <p>In treatment failure consider endoscopy for culture &amp; susceptibility.<sup>C</sup> Use 14d BD PPI PLUS 2 antibiotics. Consider adding bismuth salt.</p>	<p>Alternative regimens<sup>A+</sup> PPI OR ranitidine bismuth citrate PLUS 2 antibiotics: amoxicillin clarithromycin<sup>A+</sup> metronidazole</p>	<p>BD 400 mg BD  1 g BD 500 mg BD 400 mg BD</p>	
<b>Infectious diarrhoea</b>	<p><b>Antibiotic therapy not indicated unless patient systemically unwell or post-antibiotic, suggesting <i>Clostridium difficile</i>.</b></p>			
<b><i>Clostridium difficile</i></b>	<p>Stop unnecessary antibiotics and/or PPIs to re-establish normal flora. 70% respond to metronidazole in 5 days; 94% in 14 days. Severe if T &gt;38.5; WCC &gt;15, rising creatinine or signs/symptoms of severe colitis.</p> <p><b>Consult HPSC website for guidance document:</b> Surveillance, Diagnosis &amp; Management of <i>Clostridium difficile</i>-associated disease in Ireland (2008)</p>	<p>1st/2nd episodes metronidazole</p> <p>3rd episode/severe vancomycin</p>	<p>400mg oral TDS</p> <p>125mg oral QDS</p>	<p>10-14 days</p>
<b>Traveller's diarrhoea</b>	<p><b>Limit prescription of antibacterial to be carried abroad</b> and taken if illness develops (ciprofloxacin 750 mg single dose) to people travelling to remote areas and for people in whom an episode of infective diarrhoea could be dangerous.</p>			
<b>Threadworms</b>	<p>Treat household contacts. Advise morning shower/baths and hand hygiene. Use piperazine in children under 6 months.</p>	<p>mebendazole in all &gt;6 mths</p> <p>or piperazine/senna sachet</p>	<p>100 mg</p> <p>3 mths- 1yr 2.5ml 1-6 yrs 5mls &gt;6yrs 1 sachet</p>	<p>stat</p> <p>stat, repeat after 2 weeks</p>

Note: Doses are oral and for adults unless otherwise stated. Please refer to BNF/BNFC/MIMS/Product SPC for further information (Refer to page 14 for guidance on dosing in children). Letters indicate strength of evidence range from A+ (systematic review) to D (informal opinion).

# GENITAL TRACT INFECTIONS

## Note:

STI clinics may also known as STD, GUM & GUIDE clinics

Illness	Comments	Treatment	Dose	TX Duration
<b>Vaginal candidiasis</b>	All topical and oral azoles give 80-95% cure. <sup>A-</sup> In pregnancy avoid oral azole. <sup>B</sup>	clotrimazole 10% OR clotrimazole OR fluconazole	5 g vaginal cream 500 mg pessary 150 mg orally	stat
<b>Bacterial vaginosis</b>	A 7 day course of oral metronidazole is slightly more effective than 2 g stat. <sup>A+</sup> Avoid 2g stat dose in pregnancy & breastfeeding. Topical treatment gives similar cure rates <sup>A+</sup> but is more expensive.	metronidazole <sup>A+</sup>  OR metronidazole 0.75% vag gel <sup>A+</sup>  OR clindamycin 2% cream <sup>A+</sup>	400 mg BD  5g applicatorful at night  5g applicatorful at night	7 days  5 days  7 days
<b>Chlamydia trachomatis</b>	Treat contacts and consider referral to STI clinic if indicated. In pregnancy or breastfeeding: azithromycin can be used but is 'off label'.  If erythromycin or amoxicillin is used, retest after 5 weeks, as less effective.	azithromycin <sup>A+</sup>  OR doxycycline <sup>A+</sup> OR erythromycin <sup>A-</sup>  OR amoxicillin <sup>A+</sup>	1 g stat  100 mg BD 500 mg BD or 500 mg QDS 500 mg TDS	1 hr before or 2 hrs after food 7 days 14 days 7 days 7 days
<b>Trichomoniasis</b>	Refer to STI clinic. Treat partners simultaneously. In pregnancy avoid 2g single dose metronidazole. Topical clotrimazole gives symptomatic relief (not cure).	metronidazole <sup>A-</sup>  clotrimazole	400 mg BD or 2 g in single dose 100 mg pessary	5 days 6 days
<b>Pelvic Inflammatory Disease (PID)</b>	Essential to test for <i>N. gonorrhoea</i> (as increasing antibiotic resistance) and chlamydia. Microbiological and clinical cure are greater with ofloxacin than with doxycycline. <sup>A+</sup> Refer contacts to STI clinic.	metronidazole + ofloxacin <sup>B</sup> OR metronidazole + doxycycline <sup>B</sup>	400 mg BD 400 mg BD  400 mg BD 100 mg BD	14 days
<b>Acute prostatitis</b>	4 weeks treatment may prevent chronic infection. Quinolones are more effective, as they have greater penetration into prostate.	ciprofloxacin OR ofloxacin <sup>C</sup> OR trimethoprim <sup>C</sup>	500 mg BD 200 mg BD 200 mg BD	28 days

# SKIN and SOFT TISSUE INFECTIONS

Panton-Valentine Leukocidin (PVL) is a toxin produced by 2% of *Staphylococcus aureus* and is associated with persistent recurrent pustules and carbuncles or cellulitis. Send swabs for culture in these clinical scenarios. On rare occasions it causes more severe invasive infections, even in otherwise fit people. Risk factors include: nursing homes, contact sports, sharing equipment, poor hygiene and eczema.

<b>Acne vulgaris</b>	Topical treatment first line e.g. benzoyl peroxide gel, retinoid or topical antibiotic. Avoid using topical and oral antibiotics concurrently. However, topical benzoyl peroxide gel with oral antibiotic reduces risk of antibiotic resistance.	doxycycline OR lymecycline OR erythromycin (OR trimethoprim in tetracycline resistance)	100mg OD 408mg OD 500mg BD 300mg BD	Review in 3 months, but may take 4-6 months
<b>Impetigo</b>	Systematic review indicates topical and oral treatment produces similar results. <sup>A+</sup> As resistance is increasing reserve topical antibiotics for very localised lesions. <sup>C</sup> or <sup>D</sup> Reserve Mupirocin for MRSA.	<i>first line</i> - flucloxacillin or clarithromycin <i>fusidic acid</i> <i>mupirocin (MRSA only)</i>	Oral 500 mg QDS Oral 500 mg BD <i>Topically TDS</i> <i>Topically TDS</i>	7 days 5 days
<b>Eczema</b>	Using antibiotics, or adding them to steroids, in eczema encourages resistance and does not improve healing unless there are visible signs of infection. In infected eczema, use treatment as in impetigo.			
<b>Cellulitis</b>	If patient afebrile and healthy other than cellulitis flucloxacillin may be used as single drug treatment. If water exposure, discuss with microbiologist. If febrile and ill, admit for IV treatment  In facial cellulitis use co-amoxiclav <sup>C</sup>	flucloxacillin  <i>If penicillin allergic:</i> clarithromycin alone OR clindamycin  co-amoxiclav	500 mg QDS  500 mg BD 450mg QDS  500/125 mg TDS	7 – 14 days
<b>Leg ulcers</b>	<b>Antibiotics do not improve healing unless active infection.<sup>A+</sup></b> Culture swabs and antibiotics are only indicated if there is evidence of clinical cellulitis; increased pain; enlarging ulcer or pyrexia.			
	Review antibiotics after culture results. Refer for specialist opinion if severe infection.	flucloxacillin OR clarithromycin	500 mg QDS 500mg BD	7 days and review

# SKIN and SOFT TISSUE INFECTIONS

Illness	Comments	Treatment	Dose	TX Duration
<b>Animal bite</b>	Surgical toilet most important. Assess tetanus and rabies risk. Antibiotic prophylaxis advised for – puncture wound; bite involving hand, foot, face, joint, tendon, ligament; immunocompromised, diabetics, elderly, asplenic.	<i>First line animal &amp; human prophylaxis and treatment</i> co-amoxiclav <sup>B-</sup>	375-625 mg TDS	7 days
<b>Human bite</b>	Antibiotic prophylaxis advised. Assess HIV/hepatitis B & C risk.	<i>If penicillin allergic:</i> metronidazole PLUS doxycycline OR clarithromycin (human)	200-400 mg TDS 100 mg BD 250-500 mg BD	
<b>Conjunctivitis</b>	<b>Most bacterial infections are self-limiting</b> (64% resolve on placebo <sup>A+</sup> ). They are usually unilateral with yellow-white mucopurulent discharge. Fusidic acid has minimal Gram-negative activity.	If severe: <sup>B+</sup> chloramphenicol 0.5% drops PLUS 1% ointment  fusidic acid	2 hrly reducing to QDS when infection controlled & at night  1% gel BD	All for 48 hours after resolution
<b>Scabies</b>	Treat whole body including scalp, face, neck, ears, under nails (BNF recommendations; manufacturers recommend to exclude head and neck).  All members of the affected household should be treated simultaneously.	permethrin <sup>A+</sup> <i>If allergy:</i> Malathion	5% cream  0.5% aqueous liquid	2 applications one week apart

<p><b>Dermatophyte infection of the proximal fingernail or toenail</b></p>	<p>Take nail clippings: Start therapy if infection is confirmed by laboratory. Idiosyncratic liver reactions occur rarely with terbinafine. It is more effective than the azoles. Itraconazole is also active against yeasts. In non-dermatophyte moulds use itraconazole.<sup>C</sup> For children seek advice.</p>	<p>5% amorolfine nail lacquer<sup>B</sup> (for superficial) terbinafine<sup>A</sup></p> <p><i>Second line:</i> itraconazole</p>	<p>1-2x/weekly fingers toes</p> <p>250 mg OD fingers toes</p> <p>200 mg BD fingers toes</p>	<p>6 months 12 months</p> <p>6 – 12 weeks 3 – 6 months</p> <p>7 days monthly (2 courses) 7 days monthly (3 courses)</p>
<p><b>Dermatophyte infection of the skin</b></p>	<p>Take skin scrapings for culture if not localised. Treatment: 1 week terbinafine as effective as 4 weeks azole.<sup>A</sup> If intractable consider oral itraconazole. Discuss scalp infections with specialist.</p>	<p>Topical 1% terbinafine <sup>A+</sup> Topical undecenoic acid or 1% azole<sup>A+</sup></p>	<p>OD - BD 1-2x/daily</p>	<p>1 week<sup>A+</sup> 4 – 6 weeks<sup>A+</sup></p>
<p><b>Varicella zoster/ Chicken pox &amp; Herpes zoster/ shingles</b></p>	<p>If pregnant/immunocompromised seek advice. <b>Chicken pox:</b> In immunocompetent value of antivirals minimal unless severe pain, or adult, or on steroids, or secondary household case <b>AND</b> treatment started &lt;24h of onset of rash.<sup>A</sup> <b>Shingles:</b> Always treat if active ophthalmic, and Ramsey Hunt or eczema. <b>Non-ophthalmic shingles:</b> Treat &gt;50 yrs if &lt;72h of onset of rash, as post-herpetic neuralgia rare in &lt;50 yrs but occurs in 20% &gt;50 yrs<sup>A+</sup>.</p>	<p>aciclovir</p> <p><i>Second line if a compliance problem</i></p> <p>valaciclovir</p> <p>or</p> <p>famciclovir</p>	<p>800 mg 5x/day</p> <p>1 g TDS</p> <p>750 mg OD</p>	<p>7 days</p>

## Prescribing for children

### Weight and height

The adjacent table shows the mean values for weight and height by age; these values may be used to calculate doses in the absence of actual measurements. However, the child's actual weight and height might vary considerably from the values in the table and it is important to see the child to ensure that the value chosen is appropriate. In most cases the child's actual measurement should be obtained as soon as possible and the dose re-calculated.

*(Adapted from BNF for children 2006)*

Age	Weight kg	Height cm
Full-term neonate	3.5	50
1 month	4.2	55
2 months	4.5	57
3 months	5.6	59
4 months	6.5	62
6 months	7.7	67
1 year	10	76
3 years	15	94
5 years	18	108
7 years	23	120
10 years	30	132
12 years	39	148
14 years	50	163
Adult male	68	173
Adult female	56	163

Approximate conversions and units					
lb	kg	stones	kg	ml	fl oz
1	0.45	1	6.35	50	1.8
2	0.91	2	12.70	100	3.5
3	1.36	3	19.05	150	5.3
4	1.81	4	25.40	200	7.0
5	2.27	5	31.75	500	17.6
6	2.72	6	38.10	1000	35.2
7	3.18	7	44.45		
8	3.63	8	50.80		
9	4.08	9	57.15		
10	4.54	10	63.50		
11	4.99	11	69.85		
12	5.44	12	76.20		
13	5.90	13	82.55		
14	6.35	14	88.90		
		15	95.25		

# Diagnosis & Management of Urinary Tract Infection (UTI) in Long Term Care Residents > 65 years<sup>1</sup>

## KEY MESSAGES

- Diagnosis of UTI in residents > 65 years requires a combination of reliable clinical signs and symptoms AND a positive urine culture result.
- Only perform urine dipstick testing or send urine for culture in patients who are symptomatic. Do not perform urine dipstick testing or send urine for culture solely on the basis of urine odour or appearance
- Residents in long term care facilities have high rates of abnormal dipstick and urine test results WITHOUT infection necessarily being present. Antibiotic therapy in these cases does not reduce mortality or prevent symptomatic episodes, rather it increases side effects and leads to antibiotic resistance.
- DO NOT ROUTINELY USE ANTIBIOTIC PROPHYLAXIS TO PREVENT URINARY TRACT INFECTION

## 1: SIGNS AND SYMPTOMS OF UTI

- Diagnosis of UTI should be based on a full clinical assessment.
- Symptoms & signs suggestive of urinary tract infection include:

Dysuria	Frequency	Urgency	New onset incontinence
Fever >38°C	Suprapubic tenderness		Haematuria
- In patients with a urinary catheter loin pain and fever >38°C are significant indicators of a UTI.  
**\*\*\*DO NOT SEND URINE FOR CULTURE IF THERE ARE NO SIGNS AND SYMPTOMS OF UTI\*\*\***
- Dipstick urine testing is NOT a reliable way to diagnose UTI. Do not perform dipstick urinalysis if patients are asymptomatic or if a urinary catheter is present as false positives will occur.
- Empiric treatment may be considered in a SYMPTOMATIC patient with a positive dipstick. A urine sample should be sent to the microbiology laboratory for culture and antimicrobial susceptibility testing in these cases.
- A positive urine dipstick result in an asymptomatic patient is not significant and should not be treated.

# 2

## HOW TO INTERPRET URINE CULTURE RESULTS IN RESIDENTS WITHOUT A URINE CATHETER

### MICROSCOPY

<b>White Cells</b>	No white cells present indicate no inflammation therefore culture result is unlikely to indicate UTI. White cells $\geq 100/\mu\text{l}$ are considered to represent inflammation.
<b>Epithelial cells/ mixed growth</b>	Presence indicates perineal contamination and therefore culture result is unlikely to indicate UTI
<b>Red cells</b>	May be present in UTI, patients with persistent hamaturia post UTI should be referred

### CULTURE

Single organism  $\geq 10,000$  ( $10^4$ ) colony forming units (CFU)/mL OR  
 $\geq 100,000$  ( $10^5$ ) mixed growth with one predominant organism OR  
*Escherichia coli* or *Staphylococcus saprophyticus*  $\geq 1,000$  ( $10^3$ )CFU/mL

Usually indicates UTI but only in patients with symptoms

*Positive culture/microscopy result and no symptoms = bacteriuria, not infection and does not require antibiotic treatment.*

# 3

## HOW TO INTERPRET A URINE CULTURE RESULT IN RESIDENTS WITH A URINARY CATHETER

- Laboratory microscopy should **not** be used to diagnose UTI in catheterised patients as urine white cells are often elevated due to the presence of the catheter
- If the urine culture result is positive (see section 2) treat only if the resident has symptoms or signs suggestive of UTI and no other source is identified.
- In the presence of a urinary catheter antibiotics will not eradicate bacteriuria

## EMPIRICAL TREATMENT OF UTI IN RESIDENTS

- Only consider empiric antibiotic therapy in SYMPTOMATIC patients pending urine culture result.
- Choice of empirical therapy should be guided by local resistance rates where available.
- **Modify treatment according to culture result when available.**
- For treatment of uncomplicated UTI in patients < 65, please refer to page 8 of these guidelines.

### Uncomplicated UTI i.e. no fever or flank pain, first presentations / low risk of resistant organisms

Trimethoprim 200mg BD OR Nitrofurantoin\* 50-100mg QDS for 7 days (\*Avoid in renal impairment)

Use of Cephalexin 500mg BD or Co-amoxiclav 500/125mg TDS may also be considered - based on local resistance rates

### Acute pyelonephritis

Co-amoxiclav 500/125mg TDS for 14 days  
OR Ciprofloxacin 500mg BD for 7 days

If no response within 24 hours consider hospital referral

## EMPIRICAL TREATMENT OF UTI IN RESIDENTS WITH A URINARY CATHETER

### First presentations / low risk of resistant organisms

Trimethoprim 200mg BD  
OR  
Nitrofurantoin 50-100mg QDS\*  
(\*Avoid in renal impairment)

### Previous resistance to, or risk of, trimethoprim or nitrofurantoin resistance

Cephalexin 500mg BD  
OR  
Co-amoxiclav 500/125mg TDS  
(Consider based on local resistance rates)

### Duration of therapy

Prompt resolution of symptoms: 7 days

Delayed response (regardless of whether patient remains catheterised or not): 10-14 days

If an indwelling catheter has been in place for >2 weeks at the onset of UTI and is still indicated, the catheter should be replaced.

# 5

## ANTIBIOTIC PROPHYLAXIS

### DO NOT ROUTINELY USE ANTIBIOTIC PROPHYLAXIS TO PREVENT URINARY TRACT INFECTION

Antibiotic prophylaxis is **not** recommended for the prevention of symptomatic UTI in catheterised patients.

Antibiotic prophylaxis is **not** recommended for urinary catheter changes unless there is a definite history of symptomatic UTIs due to catheter change.

Antimicrobial prophylaxis may be considered in patients for whom the number of urinary infections are of such frequency or severity that they chronically impinge on function and well-being.

- 1: Adapted from guideline document: Diagnosis & Management of Urinary Tract Infection (UTI) in Long Term Care Residents > 65 years, [www.hpsc.ie](http://www.hpsc.ie)

## Disclaimer:

Whilst every effort has been made to ensure the accuracy of the information and material contained in this document, errors or omissions may occur in the content. We acknowledge that new evidence may emerge that may overtake some of these recommendations. The document will be reviewed and revised as and when appropriate. Prescribers should ensure that the correct drug and dose is prescribed, as is appropriate for each individual patient. References that should be used in conjunction with these guidelines include the British National Formulary (BNF) and the drug data sheets (available on [www.medicines.ie](http://www.medicines.ie)). Clinical guidelines are guidelines only and the interpretation and application of the guidelines remains the responsibility of the individual clinician.

### *The following references were used when developing these guidelines:*

This guidance was initially developed in 1999 by practitioners in South Devon, England, as part of the S&W Devon Joint Formulary Initiative, and Cheltenham & Tewkesbury Prescribing Group, and adapted by the HPA (UK) and published as guidance for consultation and local adaptation, [www.hpa.org.uk](http://www.hpa.org.uk)

The guidance has been updated annually as significant research papers, systematic reviews and guidance have been published.

The guidance has been reviewed, supplemented and adapted for use in Ireland. References are available in the online version of these guidelines, see [www.hpsc.ie](http://www.hpsc.ie).

## Grading of guidance recommendations

The strength of each recommendation is qualified by a letter in parenthesis.

Study Design	Grade
Good recent systematic review of studies	A+
One or more rigorous studies, not combined	A-
One or more prospective studies	B+
One or more retrospective studies	B-
Formal combination of expert opinion	C
Informal opinion, other information	D

## Further Information

### Further information and guidelines are available at:

Public Information Campaign on Antibiotics: [www.hse.ie/go/antibiotics](http://www.hse.ie/go/antibiotics)

Healthcare-associated Infection (e.g. C. difficile, MRSA) and infection control guidelines: [www.hpsc.ie](http://www.hpsc.ie)

Information on antibiotic use and antibiotic resistance in Ireland: [www.hspc.ie](http://www.hspc.ie)

Feedback can be submitted on these guidelines to [antibiotics@hpsc.ie](mailto:antibiotics@hpsc.ie)

To download this guideline document (Version 2.3), see [www.hpsc.ie](http://www.hpsc.ie).

For a full list of references and for further updated versions of these guidelines see also [www.hpsc.ie](http://www.hpsc.ie)



A Strategy for the Control of  
Antimicrobial Resistance in Ireland

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