



## Antibiotic Guidelines - Cephalosporins, Quinolones and Co-amoxiclav

The aims of using antibiotics is to provide a simple, effective, economical and empirical approach to the treatment of common infection and to minimise the emergence of bacterial resistance in the community.

### Principals of treatment in relation to cephalosporins, quinolones and co-amoxiclav

- Use simple generic antibiotics if possible. Avoid broad spectrum antibiotics (e.g. cephalosporins, quinolones, and co-amoxiclav) when narrow spectrum antibiotics remain effective, as they increase the risk of *Clostridium difficile*, MRSA and resistant UTIs. Where possible, avoid quinolones in pregnancy.

### *Clostridium difficile* Infections: Prevention and Reduction

- Antibiotic use is the most significant and frequently reported predisposing risk factor for *C. difficile* associated diarrhoea (CDAD) in hospital and community settings. Proliferation of *C. diff* is most likely to occur with those antibiotics which have an effect on normal GI flora including cephalosporins.
- Current evidence indicates that second or third generation cephalosporins, (e.g. cefuroxime, cefixime, cefotaxime, ceftriaxone) are significantly more likely to provoke CDAD. Studies from North America have specifically identified the role of quinolones in *C. diff* outbreaks. There is also increasing evidence for the implication of fluoroquinolones, first-generation cephalosporins (e.g. cephalixin) and co-amoxiclav. These antibiotics should be used sparingly, especially for the elderly, for patients in institutions with CDAD, and in patients previously diagnosed and treated for CDAD.

**Please note doses given are for adults. Child doses can be accessed through the children's version of the BNF (cBNF) <https://bnfc.nice.org.uk/>**

For more detailed information please refer to the full PHE antibiotics guideline document available at:

<https://www.gov.uk/government/publications/managing-common-infections-guidance-for-primary-care>



		ILLNESS	COMMENTS	DRUG	ADULT DOSE	DURATION OF TREATMENT
		<p>Do not prescribe co-amoxiclav to people with:</p> <ul style="list-style-type: none"> <li>A true penicillin hypersensitivity. Gastrointestinal adverse effects alone (such as nausea, vomiting, or diarrhoea) do not constitute an allergy to penicillin</li> <li>History of penicillin-associated hepatic dysfunction.</li> </ul>		<p>Prescribe co-amoxiclav with caution in people with:</p> <ul style="list-style-type: none"> <li>A history of allergic reaction to penicillins or hypersensitivity to cephalosporins</li> <li>Mononucleosis — use is not recommended due to increased risk of erythematous skin rash</li> <li>Glandular fever</li> <li>Cytomegalovirus infections</li> <li>Acute or chronic lymphocytic leukaemia</li> <li>Hepatic impairment</li> <li>Renal impairment: reduce the dose of co-amoxiclav if creatinine clearance is 30 mL/min or less.</li> </ul>		
Co-amoxiclav	Acute sinusitis	<p><b>Symptoms &lt;10 days:</b> do not offer antibiotics as most resolve in 14 days without, and antibiotics only offer marginal benefit after 7 days (NNT15). <b>Symptoms &gt;10 days:</b> no antibiotic, or <b>back-up antibiotic</b> if several of: purulent nasal discharge; severe localised unilateral pain; fever; marked deterioration after initial milder phase. <b>Systemically very unwell, or more serious signs and symptoms:</b> immediate antibiotic. <b>Suspected complications:</b> e.g. sepsis, intraorbital or intracranial, refer to secondary care. <b>Self-care:</b> paracetamol/ibuprofen for pain/fever. Consider high-dose nasal steroid if &gt;12 years - mometasone 200mcg BD 14 days. Nasal decongestants or saline may help some.</p>	<p>No antibiotics: self-care <b>First line for delayed:</b> phenoxymethylpenicillin <b>Penicillin allergy or intolerance:</b> doxycycline or clarithromycin</p> <p><b>Very unwell or worsening:</b> co-amoxiclav</p>	<p>500mg QDS</p> <p>200mg stat then 100mg OD 500mg BD</p> <p>625mg TDS</p>	<p>5 days</p> <p>5 days 5 days</p> <p>5 days</p>	
	Acute exacerbation of COPD	<p>Treat exacerbations promptly with antibiotics if purulent sputum <b>and</b> increased shortness of breath <b>and/or</b> increased sputum volume. Risk factors for antibiotic resistance include: severe COPD (MRC&gt;3), co-morbidity, frequent exacerbations, antibiotics in last 3 months.</p>	<p>Amoxicillin or doxycycline or clarithromycin</p> <p><b>Only if resistance:</b> co-amoxiclav</p>	<p>500mg TDS 200mg stat then 100mg OD 500mg BD</p> <p>625mg TDS</p>	<p>5 days</p>	
	Acute pyelonephritis	<p>If admission not needed, send MSU for culture &amp; susceptibility and start antibiotics. If no response within 24 hours, seek advice. <b>If ESBL risk</b> and with microbiology advice consider IV antibiotic via outpatients.</p>	<p>Co-amoxiclav or ciprofloxacin <i>If organism sensitive:</i> trimethoprim</p>	<p>625mg TDS 500mg BD 200mg BD</p>	<p>7 days 7 days 14 days</p>	
	Cellulitis-facial	<p>If facial (non-dental)</p>	<p>Co-amoxiclav</p>	<p>625mg TDS</p>	<p>7 days. If slow response give a further 7 days.</p>	
	Bites (human or animal)	<p><b>Human:</b> thorough irrigation is important. Assess risk of tetanus, rabies, HIV, hepatitis B and C. Antibiotic prophylaxis is advised. <b>Cat:</b> always give prophylaxis. <b>Dog:</b> give prophylaxis if puncture wound; bite to hand, foot, face, joint, tendon or ligament; immunocompromised/asplenic/ cirrhotic/ presence of prosthetic valve /joint. <b>Penicillin allergy:</b> Review all at 24 and 48 hours, as not all pathogens are covered</p>	<p><b>Prophylaxis or treatment:</b> co-amoxiclav <b>If penicillin allergic:</b> <b>Human :</b> metronidazole AND clarithromycin <b>Animal:</b> metronidazole AND doxycycline</p>	<p>375-625mg TDS</p> <p>400mg TDS 250-500mg BD 400mg TDS 100mg BD</p>	<p>7 days</p> <p>7 days. Review at 24 &amp; 48hrs</p>	



	ILLNESS	COMMENTS	DRUG	ADULT DOSE	DURATION OF TREATMENT
Cephalosporins should be given cautiously to penicillin-sensitive people. The BNF advises that about 6.5% of penicillin-sensitive people will also be allergic to cephalosporins					
<b>Cephalosporin</b>	UTI in pregnancy	Send MSU for culture and start antibiotics in all with significant positive culture, even if asymptomatic. <b>First line:</b> nitrofurantoin, unless at term. <b>Second line:</b> trimethoprim; avoid if low folate status, or on folate antagonist. <b>Third line:</b> cephalosporins, as risk of C. difficile.	<b>First line:</b> nitrofurantoin (avoid at term) <b>Second line:</b> trimethoprim (give folate if first trimester) <b>Third line:</b> cefalexin	100mg m/r BD or 50mg i/r QDS  200mg BD (off-label) 500mg BD	7 days
	UTI in children	<b>Child &lt;3 months:</b> refer urgently for assessment. <b>Child ≥ 3 months:</b> use positive nitrite to guide antibiotic use, also send pre-treatment MSU. <b>Imaging:</b> refer if child <6 months, or recurrent or atypical UTI. <b>Upper UTI:</b> refer to paediatrics to: obtain a urine sample for culture; assess for signs of systemic infection; consider systemic antimicrobials.	<b>Lower UTI:</b> nitrofurantoin or trimethoprim <b>If susceptible,</b> amoxicillin <b>Second line only:</b> cefalexin	See <a href="#">cBNF</a>	3 days
	Gonorrhoea	Antibiotic resistance is now very high. Use IM ceftriaxone plus oral azithromycin, refer to GUM. Test of cure is essential.	Ceftriaxone PLUS oral azithromycin	500mg IM 1g	Stat Stat
	Pelvic Inflammatory Disease (gonorrhoea likely)	Refer woman and sexual contacts to GUM service. Always culture for gonorrhoea and chlamydia. If gonorrhoea likely (partner has it, severe symptoms, sex abroad) use ceftriaxone regimen as resistance to quinolones is high.	metronidazole PLUS doxycycline PLUS ceftriaxone	400mg BD 100mg BD 500mg IM	14 days 14 days Stat
	Suspected meningococcal disease	<b>Transfer all patients to hospital immediately.</b> If time before hospital admission, and non-blanching rash, give IV benzylpenicillin or IV cefotaxime, unless definite history of hypersensitivity. Rash is not a contraindication.	IV or IM benzylpenicillin OR IV or IM cefotaxime	Child <1 year: 300mg Child 1-9 years: 600mg Over 10+ years: 1.2g Child < 12 yrs: 50 mg/kg Age 12+ years: 1gram	Stat. Give IM if vein cannot be found
<b>Prevention of secondary case of meningitis: Only prescribe following advice from Public Health Doctor:</b> 9 am – 5 pm: ☎ 0300 303 8537      Out of hours: Contact on-call doctor ☎ 01245 444417					



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<p><b>Quinolones-General prescribing advice.</b> The BNF and the cBNF state that quinolones cause arthropathy in the weight-bearing joints of immature animals and are therefore generally not recommended in children and growing adolescents. However, the significance of this effect in humans is uncertain and in some specific circumstances short-term use of either ciprofloxacin or nalidixic acid may be justified in children. Avoid quinolones in people with a history of seizures or conditions that predispose to seizures, or a history of tendon disorders related to quinolones. Advise patients to discontinue treatment with quinolones and seek immediate medical advice if joint or tendon pain should occur, because tendon damage (including rupture) has been reported rarely in people receiving quinolones. Avoid the use of non-steroidal anti-inflammatory drugs (NSAIDs) with quinolones because of an increased risk of convulsions. Quinolones should be used with caution in G6PD deficiency and myasthenia gravis (risk of exacerbation). Exposure to excessive sunlight should be avoided. Quinolones can also prolong the QT interval and in diabetics affect blood glucose.</p>					
<b>Quinolones</b>	<b>Acute pyelonephritis</b>	If admission not needed, send MSU for culture & susceptibility and start antibiotics. If no response within 24 hours, seek advice. <b>If ESBL risk</b> and with microbiology advice consider IV antibiotic via outpatients.	ciprofloxacin or co-amoxiclav <b>If organism sensitive:</b> trimethoprim	500mg BD 625mg TDS 200mg BD	7 days 7 days 14 days
	<b>Recurrent UTI in non-pregnant women (2 in 6 months or ≥ 3 in a year)</b>	<b>First line:</b> advise simple measures, including hydration; ibuprofen for symptom relief. Cranberry products (self-care) work for some women. <b>Second line:</b> stand-by or post-coital antibiotics. <b>Third line:</b> antibiotic prophylaxis. Consider methenamine hippurate 1g BD if no renal/hepatic impairment for 6 months.	<b>Antibiotic prophylaxis:</b> <b>First line:</b> nitrofurantoin <b>Second line:</b> ciprofloxacin <b>If recent culture sensitive:</b> trimethoprim	100mg m/r 500mg 100mg <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> <i>At night or post coital stat (off-label)</i> </div>	3-6 months, then review recurrence rate and need.
	<b>Acute prostatitis</b>	Send MSU for culture and start antibiotics. 4-wk course may prevent chronic prostatitis. Quinolones achieve higher prostate levels.	Ciprofloxacin or ofloxacin <b>Second line:</b> trimethoprim	500mg BD 200mg BD 200mg BD	28 days
	<b>Eradication of H. Pylori</b>	Treat all positives, if known DU, GU or low grade MALToma. NNT in non-ulcer dyspepsia: 14. Do not offer eradication for GORD. Do not use clarithromycin, metronidazole or quinolone if used in the past year for any infection. <b>Penicillin allergy:</b> use PPI PLUS clarithromycin PLUS metronidazole. If previous clarithromycin, use PPI PLUS bismuth salt PLUS metronidazole PLUS tetracycline hydrochloride. <b>Relapse and previous metronidazole &amp; clarithromycin use only:</b> use PPI + amoxicillin + either tetracycline OR levofloxacin. <b>Retest for H. pylori</b> post DU/GU or relapse after second line therapy: using breath or stool test OR consider referral for endoscopy and culture.	<b>Only for relapse after initial treatment with metronidazole +clarithromycin:</b> PPI PLUS amoxicillin PLUS tetracycline or levofloxacin.	1g BD 500mg QDS 250mg BD	<i>All for 7 days</i>  MALToma – 14 days
	<b>Epididymitis</b>	Usually due to Gram-negative enteric bacteria in men over 35 years with low risk of STI. If under 35 years or STI risk, refer to GUM.	doxycycline or ofloxacin or ciprofloxacin	100mg BD 200mg BD 500mg BD	10-14 days 14 days 10 days
	<b>Pelvic Inflammatory Disease (gonorrhoea unlikely)</b>	Refer woman and sexual contacts to GUM service. Always culture for gonorrhoea and chlamydia. If gonorrhoea likely (partner has it, severe symptoms, sex abroad) use ceftriaxone regimen as resistance to quinolones is high (see cephalosporin section).	metronidazole PLUS ofloxacin	400mg BD 400mg BD	14 days 14 days