ANTIBIOTIC GUIDANCE FOR SHROPSHIRE & POWYS PRIMARY CARE

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Comments/suggested changes for consideration welcome. Send to stephanie.damoa-siakwan@sath.nhs.uk

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Using antibiotics is a not a subject where every answer can be pre-defined. These guidelines describe first steps in common situations and are not comprehensive or applicable to patients with two infections. Section 1 are empirical guidelines based on 'Infection Guidance for Primary Care' from PHE (references and grading of guidance recommendations are available at Guidance for primary care - Publications - GOV.UK). Empirical management will not deal with unexpected resistance, which means failure and changing antibiotics. If the situation you meet is not covered, microbiologists will be pleased to help. Note the guidance deliberately does NOT generally cover any other aspects of diagnosis (see laboratory handbook), vaccination or immunisation (See DH guidelines) or non-antibiotic treatment of infection.

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1. EMPIRICAL USE GUIDELINES.

1.1.Aims

- to provide a simple, effective, economical empirical 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

1.2. Advice

Can be obtained, if infection is severe, from the following by e-mail or telephone:

Clinical Bacteriology Results	(Phone) 01743 261000 ext 1161/1167
Serology, Molecular & Virology Results	(Phone) 01743 261000 ext 3205/1161
Clinical Enquiries	Dr G Harvey - graham.harvey@sath.nhs.uk Dr P O'Neill patricia.oneill@sath.nhs.uk Dr S Damoa-Siakwan - stephanie.damoa-siakwan@sath.nhs.uk Dr M Brian –michael.brian@sath.nhs.uk

Unless otherwise stated, these guidelines are intended for adults only. Different antibiotics doses are, and different choices may be, needed for children. However, bacterial infection is commoner as a cause of sore throat, otitis media and sinusitis in children so antibiotic guidance in these sections considers children. Not all conditions are covered. HIV therapy and Tuberculosis therapy are dealt with by specialist physicians.

1.3. Principles of Treatment

- This guidance is based on the best available evidence but its application must be modified by professional judgement.
- It is important to initiate antibiotics as soon as possible in severe infection
- Prescribe an antibiotic only when there is likely to be a clear clinical benefit.
- Do not use antibiotics for acute sore throat, colds, acute cough or sinusitis. Delayed antibiotic prescription is an option.
- Do not treat organisms in leg ulcers unless there is a 2cm erythematous zone suggesting cellulitis.
- Avoid prescribing over the telephone except in exceptional cases.
- Use simple generic antibiotics first whenever possible.
- Avoid broad-spectrum antibiotics when narrow spectrum antibiotics remain effective, as broad-spectrum antibiotics increase the risk of *Clostridium difficile*, MRSA and resistant UTIs. All antibiotics have the potential to induce Clostridium difficile associated diarrhoea. Carbapenems, cephalosporins, quinolones and clindamycin are considered to be high-risk while metronidazole, flucloxacillin, doxycyline, trimethoprim and amoxicillin are lower risk agents.
- A dose and duration of treatment is suggested for adults. Give short courses of antibiotics where possible. Five days is normally adequate unless otherwise stated and 3-day courses are satisfactory for cystitis. Always review by 7 days if you plan to continue antibiotics.
- Try to avoid giving a series of antibiotics for one infection. Another organism or pharmacological factors such as dose, absorption, and penetration to the site of infection, may be responsible for treatment failure.
- Always enquire about the nature of any reported allergy and previous reaction; symptoms such as nausea and diarrhoea are not features of true allergy. Less than 10% of individuals who are penicillin allergic are allergic to cephalosporins or carbapenems. These agents should not be given to those with a history of facial/oral swelling, difficulty breathing or urticarial rash with penicillins.
- Use higher doses in patients weighing >70Kg and certainly if the patient weighs >100Kg, penicillins are particularly safe to use at high dose. When using flucloxacillin use 1G qds for severe Staph aureus infection up to 70Kg, 1.5 g qds from 70-100Kg and 2G qds >100Kg.
- Avoid widespread use of topical antibiotics (especially gentamicin, fucidin and mupirocin)
- In pregnancy AVOID tetracyclines, aminoglycosides, ciprofloxacin, *high dose* metronidazole (2g). Take specimens to inform treatment. Short-term use of trimethoprim (theoretical risk in first trimester in patients with poor diet, or taking another folate antagonist) or nitrofurantoin (at term, theoretical risk of neonatal haemolysis) is unlikely to cause problems to the foetus.
- Where a ‘best guess’ therapy has failed or special circumstances exist, microbiological samples are essential.
- This guidance should not be used in isolation; it should be supported with patient information about back-up/delayed antibiotics, infection severity, usual duration and clinical staff education. Materials are available on the RCGP TARGET website.

ILLNESS	COMMENTS	DRUG	ADULT DOSE (unless stated)	DURATION
1.4. UPPER RESPIRATORY TRACT INFECTIONS: Consider delayed antibiotic prescriptions.[A-]				
Influenza Treatment: PHE Seasonal influenza Prophylaxis: NICE influenza	**Annual vaccination is essential for all those at risk of influenza**. For otherwise healthy adults, antivirals are not recommended. Treat 'at risk' patients with antivirals: - when influenza is circulating in the community, within 48 hours of onset of symptoms - during localised outbreaks in long term and residential nursing homes, if there is a high level of certainty that the causative agent is influenza (see CCG guideline on prescribing antivirals in this situation). At risk: pregnant (including up to 2 weeks post-partum), 65 years or over, chronic respiratory disease (including COPD and asthma) significant cardiovascular disease (not hypertension), immunocompromised, diabetes mellitus, chronic renal, liver or neurological disease, morbid obesity (BMI≥40). Use oseltamivir 75 mg oral capsule BD for 5 days. If pregnant or there is resistance to oseltamivir, use zanamivir 10 mg (2 inhalations by diskhaler) BD for 5 days. Patients under 13 years see PHE (HPA) guidance.			
Otitis media CKS Otitis media - acute	**Optimise NSAID and Paracetamol** [2,3,B]- **Avoid antibiotics** as 60% are better in 24 hours without: they only reduce pain at 2 days (NNT15) **and do not prevent deafness** [4A+] Consider 2 or 3-day-delayed or immediate antibiotics for pain relief if: • < 2yrs with bilateral Acute OM (NNT4) or bulging membrane and ≥ 4 symptoms • All ages with otorrhoea (NNT3) [A+] Antibiotics to prevent Mastoiditis NNT >4000 [7B-] Macrolides concentrate intracellularly and are less active against the extracellular H influenzae	*First line* amoxicillin *Second line* co-amoxiclav *ONLY if penicillin allergic & not ideal for Haemophilus.* Clarithromycin *Erythromycin can be used but has more unwanted effects*	40 mg/kg/day in 3 divided doses Maximum 1g TDS in those aged >10 years 1-6 yrs 125/31 mg TDS 6-12 yrs 250/62 mg TDS Adults 250/125 mg TDS 250mg-500mg BD (adults) <2 yrs 125 mg QDS 2-8 yrs 250 mg QDS Adults: 250-500 mgQDS	5 days

Pharyngitis/ sore throat/ tonsillitis CKS Sore throat-acute	**Avoid antibiotics** as 90% resolve in 7 days without, and pain only reduced by16 hours [2A+] If Centor score 3 or-4: (Lymphadenopathy; No Cough; Fever; Tonsillar Exudate) [3,A-] consider 2 or 3 day-delayed or immediate antibiotics [1,A+] Antibiotics to prevent Quinsy NNT>4000 [8,B-] Antibiotics to prevent Otitis Media NNT 200 [5,A+]	*First line* Phenoxymethylpenicillin *If allergic to penicillin.* Clarithromycin. Erythromycin can also be used.	500 mg QDS or 1G BD (QDS if severe) 250 - 500 mg BD 500mg QDS	10 days 5 days
Acute Otitis Externa Otitis externa - NICE CKS	First use aural toilet (if available) & analgesia Cure rates similar at 7 days for topical acetic acid or antibiotic +/- steroid [1A+] If cellulitis or disease extends outside of the ear canal, consider oral antibiotics and refer [2A+]	*First line* Acetic acid 2% *Second line* Neomycin sulphate with corticosteroid	1 spray TDS 3 drops TDS	7 days 7-14 days
Acute sinusitis Sinusitis - NICE CKS	**Avoid antibiotics as** 80% resolve in 14 days without, and they only offer marginal benefit after 7 days NNT 15 [2,3 A+] **Use adequate analgesia** [4B+] Consider 7-day-delayed or immediate antibiotic when purulent discharge (NNT 8) [1,2 A+] Phenoxymethylpenicillin is only active against pneumococci and haemolytic streptococci and macrolides are less active against H.influenzae. If no response, switch between first line antibiotics then try second. Anaerobes more common in persistent rhinosinusitis	*First line* amoxicillin [A+] OR doxycycline (adults) OR (if pneumococcal) phenoxymethylpenicillin [A+] *If allergic to penicillin* Clarithromycin or erythromycin can be used *Second line for persistent symptoms:* co-amoxiclav	500 mg TDS 200 mg stat/100 mg OD 500mg qds 250mg-500mg BD (adults) See otitis media doses 375 mg TDS	7 days

ILLNESS	COMMENTS	DRUG	ADULT DOSE	DURATION
1.5. LOWER RESPIRATORY TRACT INFECTIONS				
Note: Avoid tetracyclines in pregnancy. Low doses of penicillins are more likely to select out resistance. **Do not use** quinolones (ciprofloxacin and ofloxacin) first line as they have poor activity against pneumococci. However, they do have use in PROVEN pseudomonal infections which are common in bronchiectasis.				
Acute cough, bronchitis Cough - NICE CKS NICE 69	**In primary care, antibiotics have little benefit in otherwise healthy adults** [A+] **so avoid**. Consider 7d delayed antibiotic with advice. Symptom resolution can take up to 3 weeks Consider immediate antibiotics if >80y and 1 of below or >65y with 2 of: hospitalization in the past year, oral steroids, diabetic, congestive cardiac failure.	Amoxicillin OR doxycycline	500 mg TDS 200 mg stat/100 mg OD	5 days
Exacerbation of COPD NICE 12 GOLD	30% viral, 30-50% bacterial (usually Haemophilus influenzae). Use antibiotics **only** if purulent sputum **and** increased dyspnoea **and/or** increased sputum volume [B+] *If clinical failure switch between first line antibiotics before using 2nd line* Risk factors for antibiotic resistant organisms include co-morbid disease, severe COPD, frequent exacerbations and antibiotics in last 3 m Avoid clarithromycin because unreliable against Haemophilus. Coliforms often isolated from sputum samples, usually reflect colonisation only.	*First line* Amoxicillin OR doxycycline *Second line* co-amoxiclav	500 mg TDS 200 mg/100mg OD 625 mg TDS	5 days
Exacerbation of Bronchiectasis BTS Bronchiectasis	*Haemophilus influenzae* common. Often associated with mucoid *Pseudomonas aeruginosa.* May require amendment according to previous culture results. Intravenous or inhaled combinations may be required.	Amoxicillin OR Doxycycline Ciprofloxacin If susceptible	1g TDS 100mg BD 500 - 750mg BD	14 days 14 days

Community-acquired pneumonia BTS Pneumonia	Manage using clinical judgement & CRB-65 score with review:[1] each scores 1: **C**onfusion (AMT<8); **R**espiratory rate >30/min; **B**P systolic<90 or diastolic≤60; Score 0 suitable for home treatment 1-2 consider hospital referral **3-4 urgent hospital admission**. If delayed admission or life threatening give immediate benzylpenicillin or amoxicillin 1G po [D.] Mycoplasma infection is rare in over 65s[1] Request legionella urinary antigen if travel history with overnight stay abroad or in UK in last 18 days	Amoxicillin OR Doxycycline	500 mg - 1g TDS 100mg BD	7 days
1.6. MENINGITIS				
Suspected meningococcal disease PHE -Meningococcal	**Transfer all patients to hospital immediately.** If time, administer benzylpenicillin or ceftriaxone prior to admission, unless history of difficulty breathing, collapse, loss of consciousness or urticarial rash with these agents. Ideally IV but IM if a vein cannot be found.	iv or im Benzylpenicillin Iv or im Ceftriaxone	Adults and children 10 yr and over: 1200 mg Children 1 - 9 yr: 600 mg Children <1 yr: 300 mg Adults, >12y 1G, Children <12y: 30mg/Kg,	
Prevention of secondary case of meningitis: Only prescribe following advice from Public Health Doctor: 9 am – 5 pm: 0344 225 3560 opt2 then opt2 Out of hours: Contact on-call Public Health Doctor via RSH switchboard 01743 261000				

ILLNESS	COMMENTS	DRUG	ADULT DOSE	DURATION
1.7. URINARY TRACT INFECTIONS				
Note:. Do not treat asymptomatic bacteriuria in the elderly (>65 years); it occurs in 25% of women and 10% of men and is not associated with increased morbidity.[B+] In the presence of a catheter, antibiotics will not eradicate bacteriuria; only send sample and treat if systemically unwell (pyrexial) or pyelonephritis likely. Treatment may occasionally be advised for clearance/suppression of MRSA carriage. Do not routinely use prophylactic antibiotics for catheter changes unless history of catheter change associated UTI or trauma Amoxicillin resistance is common, therefore ONLY use if culture confirms susceptibility Avoid nitrofurantoin in renal failure, diabetics, upper UTI or previous treatment failures with the drug. See PHE UTI guidance for diagnostic information PHE quick reference				
Uncomplicated UTI i.e. no fever, rigors or flank pain in adults PHE UTI women - NICE CKS UTI men - NICE CKS SIGN RCGP clinical module	**Women, mild/or ≤2 symptoms**: use dipstick and presence of cloudy urine to guide treatment. Nitrite & blood/leucocytes has 92% positive predictive value; -ve nitrite, leucocytes, and blood has a 76% NPV [4A-] **Women severe/or ≥ 3 symptoms**: treat **Men**: Consider prostatitis & send pre-treatment MSU [1,5C] OR if symptoms mild/non-specific, use –ve dipstick to exclude UTI. [6C] **Always safety net** as E.coli bacteraemia is increasing in the community	nitrofurantoin[A-] OR trimethoprim[B+] OR pivmecillinam	50 mg QDS 100mg m/r BD 200 mg BD 400mg stat then 200mg tds	3 days women 7days men
		Nitrofurantoin is 1st line for lower UTIs. Use if GFR >45ml/min. GFR 30-45 use only if resistance and no alternative Send cultures if treatment failure. Community Extended-spectrum beta-lactamases (ESBLs) are not uncommon (see below 3.3)		
Acute pyelonephritis i.e fever/rigors and loin pain NICE CKS	Send MSU for culture. If no response within 24 hours admit.	ciprofloxacin[A-] OR cefalexin If susceptible, trimethoprim	500 mg BD 500mg QDS 200 mg BD	7 days[A-] 10 days 10 days
UTI in pregnancy UTI - women - NICE CKS	Send MSU for culture even if screening culture positive. DO NOT use urine dipstick to exclude UTI in pregnancy. There is a low sensitivity to such tests due to urine dilution. NB Short-term use of or nitrofurantoin in pregnancy is unlikely to cause problems to the foetus.[B+] Avoid trimethoprim in the 1st trimester or if low folate status or taking folate antagonist.	Cefalexin OR amoxicillin (if known to be sensitive) OR nitrofurantoin	500 mg qds 500mg tds 50mg QDS 100mg m/r BD	7 days

Children NICE CKS	Refer children <3 months urgently for assessment If > 3 months, use positive nitrite test as criterion to start antibiotics. Send MSU in all for culture & susceptibility. Imaging: refer if child <6 months, recurrent or atypical UTI	*For therapy* trimethoprim, OR cefalexin OR, post testing, amoxicillin *For prophylaxis* trimethoprim OR nitrofurantoin	See BNF for dosage	Lower UTI 3 days Upper UTI 7-10 days
Recurrent UTI women ≥ 3/yr (non-pregnant)	To reduce recurrence first advise simple measures including hydration, cranberry products. Then standby or post-coital antibiotics. Nightly prophylaxis reduces UTIs but adverse effects and long term compliance poor.	Prophylactic nitrofurantoin OR trimethoprim	50 mg 100 mg	Stat post coital, OR OD at night Review at 6 months
Acute Prostatitis BASHH NICE CKS	Send MSU for culture and start antibiotics[1C]. 4-week course may prevent chronic prostatitis [1C]. Quinolones achieve higher prostate levels[2].	Ciprofloxacin *2nd line* Trimethoprim	500mg bd 200mg bd	28 days

1.8. GASTRO-INTESTINAL TRACT INFECTIONS

Infectious diarrhoea Gastroenteritis - NICE CKS	**Antibiotic therapy not indicated for bacterial infection unless patient systemically ill** or has had recent antibiotic therapy suggesting *Clostridium difficile.* Treatment after susceptibility testing may be considered still for Salmonella in the frail elderly. Send samples from previously healthy children with acute painful or bloody diarrhoea to exclude *E.coli* 0157 infection			
	Giardia	Metronidazole	2G daily or 400mg tds	3 days 5 days
	Entamoeba histolytica	Metronidazole followed by Diloxanide furoate	800mg tds 500mg tds	5 days 10 days
	Shigella dysenteriae or flexneri	Ciprofloxacin	500mg bd	5 days
Traveller's diarrhoea CKS	**Only consider standby antibiotics for** remote areas or people at high-risk of severe illness with travellers' diarrhoea [1, 2C] If standby antibiotics appropriate: ciprofloxacin 500 mg twice a day for 3 days (private Rx) [3C, 5B+] If quinolone resistance high (e.g. south Asia): consider bismuth subsalicylate (Pepto Bismol) as prophylaxis or 2 tablets QDS for 2 days [5B+] (advise patient to purchase from a pharmacy)			
Threadworms Threadworm - NICE CKS	Treat all household contacts at the same time PLUS advise hygiene measures for 2 weeks (hand hygiene, pants at night, morning shower) PLUS wash sleepwear, bed linen, dust and vacuum on day one	>6months: mebendazole (off label if <2y) 3-6months: piperazine+senna <3months: 6 weeks hygiene	100mg 2.5ml spoonful	Stat Stat, rpt after 2 weeks

Clostridium difficile Clostridium difficile - GOV.UK	Stop unnecessary antibiotics and review any use of PPIs. Assess severity: Severe if T >38.5; WCC >15, rising creatinine or signs/symptoms of severe colitis [1C] If severe treat with vancomycin, review progress closely and consider admission Relapse within 1 month – Treat according to worst severity of last episode or current episode. If second relapse, or severe seek microbiology or gastroenterologist advice. See also section 3.1	*1st/2nd episode* Metronidazole. *2nd relapse or severe* Vancomycin	400 mg oral TDS 125mg oral QDS	10 days 14 days
Diverticulitis Diverticular disease - NICE CKS	Oral antibiotics together with dietry modification can be used to treat uncomplicated episodes. Metronidazole alone may be sufficient to treat many episodes	Metronidazole +/- ciprofloxacin Co-amoxiclav	400mg tds 500mg bd 375mg tds	7 days
Eradication of Helicobacter pylori Dyspepsia - NICE Helicobacter pylori - GOV.UK Dyspepsia - NICE CKS	Treat all positives[2] in known DU, GU [1A+] or low grade MALToma. [2B+] In Non-Ulcer NNT is 14 [3A+ 4B+] Do not offer eradication for GORD [1C] Do not use clarithromycin, metronidazole or quinolone if used in past year for any infection [5A+, 6A+] **Penicillin allergy**:use PPI plus clarithromycin & MZ; If previous clarithromycin use PPI + bismuthate + metrondiazole + tetracycline. In relapse see NICE **Relapse and previous MZ & clari:** use PPI PLUS amoxicillin, PLUS either tetracycline or levofloxacin[1] **Retest for *H. pylori*** post DU/GU or relapse after second line therapy: using breath or stool test OR consider endoscopy for culture and susceptibility [1C]	Always use PPI PPI (use cheapest) PLUS amoxicillin AND clarithromycin OR metronidazole (MZ) *penicillin allergy and previous* MZ +Clari PPI PLUS bismuthate (De-Noltab®) PLUS metronidazole tetracycline [8C] *relapse and previous* MZ+clari PPI WITH Amoxicillin AND tetracycline OR levofloxacin	 1g bd 500mg bd 400mg bd 240 mg bd 400 mg bd 500 mg qds 1g bd 500mg tds 250mg bd	 All for 7 days[A] 14 days in relapse or MALToma

ILLNESS	COMMENTS	DRUG	ADULT DOSE	DURATION
1.9. GENITAL TRACT INFECTIONS				
Contact UKTIS for information on foetal risks if patient is pregnant				
STI screening	People with risk factors should be screened for chlamydia, gonorrhoea, HIV, syphilis. Refer to GUM clinic or GP with level 2 or 3 expertise in GUM. Risk factors: < 25y, no condom use, recent (<12mth)/frequent change of partner, symptomatic partner[1]			
Chlamydia trachomatis/ urethritis SIGN BASHH PHE Chlamydia trachomatis - GOV.UK Chlamydia - NICE CKS	Opportunistically screen all aged 15-25y Treat contacts by contacting Chlamydia coordinator / refer to general practices with level 2 or 3 expertise in GUM or GUM clinic. In pregnancy or breastfeeding: use azithromycin or erythromycin. Note this is less reliable than doxycycline and 'test of cure' should be performed no sooner than 6 weeks after Rx. Suspected epididymitis in men. Consider GUM referral if high risk	doxycycline[A+] OR azithromycin[A+] *Pregnant or breastfeeding:* Azithromycin Or erythromycin [A-] Or amoxicillin Doxycycline Ofloxacin	100 mg BD 1g 1g (off-label use) 500 mg QDS 500mg TDS 100mg BD 400mg BD	7 days Stat 1 hr before or 2 hrs after food stat 7 days 7 days 14 days 14 days
Trichomonas BASHH PHE Trichomoniasis - NICE CKS	Treat partners simultaneously and refer to GUM. In pregnancy or breastfeeding, avoid 2g single dose metronidazole. Topical clotrimazole gives symptomatic relief (but NOT cure).	metronidazole[A-] clotrimazole	400 mg BD or 2 g 100 mg pessary	5-7 days single dose 6 nights
Pelvic Inflammatory Disease BASHH Pelvic inflammatory disease - NICE CKS	Refer woman and contacts to GUM service [1,2B+] Always culture for gonorrhoea and chlamydia [2B+] 28% of gonorrhoea isolates now resistant to quinolones [3B+] If gonorrhoea likely (partner has it, severe symptoms, sex abroad) use ceftriaxone regimen or refer GUM	metronidazole + doxycycline[B] *If high risk of gonorrhoea*: metronidazole + doxycycline + ceftriaxone	400 mg BD 100 mg BD 400mg BD 100mg BD 500mg IM	14 days 14 days 14 days 14 days stat

Vaginal candida BASHH PHE Candida - female genital - NICE CKS	All topical and oral azoles give 75% cure [1A+] *Candida albicans* is the usual cause of thrush. The second most common cause of thrush is *C. glabrata*, which occurs in about 5% of infections. *C. glabrata* tends to be more resistant to antifungal treatment than *C. albicans* and is harder to treat. Candida glabrata infection: assess if causal (clear characteristic symptoms of candidiasis). Resistance to topical clotrimazole is usual and to fluconazole or itraconazole frequent (c50%). Try fluconazole but if fails try nystatin pessary[D] (available by special import) or consider borate pessary (600mg single dose in gelatin suppository od for 14 days) In pregnancy avoid oral azole[.2B-] and use intravaginal agents Candidal vulvitis can be treated topically but is almost invariably associated with vaginal infection which should also be treated	clotrimazole OR fluconazole clotrimazole miconazole 2% cream	5g 10%vaginal cream or 500 mg pessary 150 mg orally 100mg pessary 5g intravaginally BD	stat stat stat 6 nights 7 days
Bacterial vaginosis BASHH PHE Bacterial vaginosis - NICE CKS	Oral metronidazole is as effective as topical treatment but is cheaper Less relapse with 7 days of oral metronidazole than 2 g stat.[A+] at 4 weeks. Avoid 2g stat dose in pregnancy/breastfeeding. Treating partners does not reduce relapse [5B+]	metronidazole[A+] OR MTZ 0.75% vag gel [A+] OR clindamycin 2% cream[A+]	400 mg BD Or 2g 5 g applicator nocte 5 g applicator nocte	7 days stat 5 nights 7 nights
Acute Prostatitis Prostatitis - acute - NICE CKS	4 weeks treatment may prevent chronic infection. Ciprofloxacin is more effective, as has greater penetration into prostate. Culture of first specimens of urine for susceptibility tests is essential because of increases in ciprofloxacin and trimethoprim resistance.	ciprofloxacin or trimethoprim[C]	500 mg BD 200 mg BD	28 days 28 days

1.10. SKIN & SOFT TISSUE INFECTIONS				
PVL PHE	Panton-Valentine Leukocidin (PVL) is a toxin produced by 2% of *Staph aureus.* It can occur in both MRSA and MSSA and is associated with persistent recurrent pustules and carbuncles or cellulitis. Send swabs for culture in such cases. Rarely, it causes more severe invasive infections, even in otherwise fit people. Risk factors include: close contact in community, contact sports, sharing equipment, poor hygiene and eczema			
Eczema Eczema - CKS	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 (see below).			
Impetigo Impetigo - NICE CKS	For extensive, severe or bullous impetigo, use oral antibiotics [1c]. Using penicillin with flucloxacillin is unnecessary. Reserve topical antibiotics for very localised lesions to reduce the risk of resistance. Fucidin has modest topical but no systemic anti-streptococcal activity and resistance is increasing. Reserve mupirocin for MRSA	*First line* flucloxacillin or clarithromycin or erythromycin *Second line* fusidic acid	Oral 500 mg QDS Oral 500mg BD Oral 500 mg QDS Topically QDS	7 days 7 days 7 days 5 days
Cellulitis Cellulitis - acute - NICE CKS	If patient afebrile and no comorbidity, flucloxacillin or doxycycline may be used as single drug treatment. If not responding to oral regime, consider out-patient iv therapy (e.g. via DAART or in Telford and Wrekin contact single point of referral (01952 607788) to arrange for home intravenous treatment) If febrile and ill, refer for admission. If river/sea water exposure, discuss with microbiologist In facial cellulitis in children <6 years use co-amoxiclav[C]	Flucloxacillin *If penicillin allergic:* doxycycline alone co-amoxiclav	500 mg QDS 1g QDS if weighs >70Kg up to 2G QDS if > 100Kg 100mg BD (See BNF for dosage)	7 – 14 days
Foot and Leg Ulcers CKS PHE	Bacteria will always be present. **Antibiotics do not improve healing.**[A+] Culture swabs and antibiotics are **ONLY** indicated if there is evidence of clinical infection i.e.cellulitis with >2cm surrounding erythema; increased pain; enlarging ulcer or pyrexia.			
	Review after culture results. Anaerobes may be significant. Diabetics should be referred to diabetic clinics for specialist guidance. In these patients coliform /pseudomonas infections may be significant.	As for cellulitis above. Consider metronidazole if unresponsive to first line therapy in absence of resistance to flucloxacillin or doxycycline		7 –14 days

Animal Bite CKS **Human Bite**	Surgical toilet important. Assess tetanus and rabies risk (NB bats in UK). Seek microbiology advice if not human, dog or cat bite. Antibiotic prophylaxis advised for puncture wound, bite involving hand, foot, face, joint, tendon, ligament; immunocompromised, diabetics, elderly, asplenic, cirrhotic. Also assess HIV, hepatitis B & C risk	*Prophylaxis and treatment (animal or human)* co-amoxiclav[B-] *If penicillin allergic:* metronidazole PLUS doxycycline or erythromycin (human) and review at 24 & 48 hrs	375-625 mg TDS 400 mg TDS 100 mg BD 250-500 mg QDS	7 days
Scabies and Head Lice Scabies - NICE CKS	See local PHE guidelines (Specific need for discussion with CCG IPC team if scabies in nursing home resident).	Permethrin *If allergy* Malathion	5% cream 0.5% aqueous cream	2 applications 1 week apart
Dermatophyte infection of the fingernail or toenail For children seek advice CKS PHE	Take nail clippings: Start therapy only if infection is confirmed by laboratory. Liver reactions rare with oral antifungals. Terbinafine is more effective than the azoles. Itraconazole is active against yeasts, dermatophytes and some non-dermatophyte mould (excluding Scopulariopsis) .[C] Specialist advice may be required in children	terbinafine[A-] itraconazole 5% amorolfine nail lacquer[B-] (for superficial)	250 mg OD fingers toes 200 mg BD fingers toes 1-2x/week fingers toes	6-12 weeks 3 – 6 months 7 days monthly 2 courses 3 courses 6 months 12 months
Dermatophyte infection of the skin CKS - body and groin CKS - foot CKS - scalp	Terbinafine is fungicidal so treatment time is shorter then with fungistatic azoles. Use azoles for candida. Take skin scrapings for culture. If intractable consider oral itraconazole. Discuss scalp infections with dermatologist.	Topical 1% terbinafine [A+] Topical imidazole *For athletes foot only* Topical undecenoic acid (Mycota®)	BD BD BD	1-2 weeks [4A+] 4 - 6 weeks (i.e. 1-2 weeks after healing)

Varicella zoster/ Chicken pox Chickenpox - NICE CKS **Herpes zoster/ shingles** Shingles - NICE CKS **Pregnancy** RCOG	**Chicken pox**: Consider acyclovir If onset of rash <24h and >14y or severe pain or dense/oral rash or 2°household case or steroids or smoker consider aciclovir **Shingles**: Always treat if ophthalmic, and Ramsey Hunt or eczema. **Non-ophthalmic shingles**: Treat >50 yrs if <72h of onset of rash, as post-herpetic neuralgia rare in <50 yrs **Contact in pregnant or immunocompromised** send samples for immunity testing stating date and time of contact. Consult virologist/microbiologist urgently	Aciclovir *2nd line for shingles if compliance a problem* valaciclovir or famciclovir (Latter two products are better absorbed but cost >10x as much)	800 mg 5x/day Child doses – see BNF 1 g TDS 500-750 mg TDS	7 days 7 days 7 days
Cold sores	Cold sores resolve after 7-10d without treatment. Topical antivirals applied prodromally reduce duration by 12-24h			
1.11 EYE INFECTIONS				
Conjunctivitis CKS	**Most are viral or are self-limiting**. Treat if severe (65% resolve on placebo by day 5 [1A+]). Bacterial are usually unilateral and also self-limiting. Characterised by red eye with mucopurulent discharge. Differential diagnosis of red eyes, viral infection and infections associated with contact lenses is not included in these guidelines. Fusidic acid has less Gram-negative activity.	*If severe* Chloramphenicol 0.5% drops AND 1% ointment *Second line* fusidic acid	2 hrly for 2 days then 4 hrly whilst awake at night 1% gel BD	All for 48 hours after resolution

1.12 MRSA INFECTIONS AND COLONISATION

Failing to clear any nasal MRSA colonisation is much more likely if there is a skin break also growing the MRSA and in such cases both an oral antibiotic AND topical nasal decolonisation are essential. All MRSA are resistant to flucloxacillin, cephalosporins & coamoxiclav. 70% are resistant to erythromycin/clarithromycin and 98% to ciprofloxacin. Tetracycline resistance is less frequent (c 15%) but becoming commoner. See also section 3.2

MRSA PHE	Nasal carriage alone with mupirocin-susceptible MRSA	Apply mupirocin with a dry swab to both sides of nasal septum. Rub from outside of nose until tasted at back of throat.[A]	intranasally 2-3x/day	5 days
	Mupirocin & tetracycline sensitive MRSA in nose and soft tissue.	As above plus doxycycline[C]	100mg bd po[C]	Both for 10 days
	Mupirocin resistant MRSA carriage (nose +/or soft tissue)	Neomycin-chlorhexidine nasal ointment (Naseptin) AND doxycycline	intranasally qds 100mg bd	Both for 10 days
	Tetracycline and erythromycin resistant MRSA in infected soft tissue lesion & Tetracycline treatment failures of mupirocin-resistant MRSA	Discuss with microbiologist	Outpatient teicoplanin therapy may be required in some cases	

ILLNESS	COMMENTS	DRUG	ADULT DOSE (unless stated)	DURATION
1.13 DENTAL INFECTIONS				
This guidance is not designed to be a definitive guide to oral conditions. It is for GPs for the management of acute oral conditions pending being seen by a dentist or dental specialist. **GPs should not routinely be involved in dental treatment** and, if possible, advice should be sought from the patient's dentist, who should have an answer-phone message with details of how to access treatment out-of-hours, or NHS 111 on 111				
Mucosal ulceration and inflammation (simple gingivitis)	Temporary pain and swelling relief can be attained with saline mouthwash[1C] Use antiseptic mouthwash: If more severe & pain limits oral hygiene to treat or prevent secondary infection.[2-8C] The primary cause for mucosal ulceration or inflammation (aphthous ulcers, oral lichen planus, herpes simplex infection, oral cancer) needs to be evaluated and treated.	Simple saline mouthwash[1C] Chlorhexidine 0.12-0.2%[2-6A+] *(Do not use within 30 mins of toothpaste)* Hydrogen peroxide 6%[6-8A-] *(spit out after use)*	½ tsp salt dissolved in glass warm water Rinse mouth for 1 minute BD with 5 ml diluted with 5-10 ml water. Rinse mouth for 2 mins TDS with 15ml diluted in ½ glass warm water	Always spit out after use. Use until lesions resolve or less pain allows oral hygiene
Acute necrotising ulcerative gingivitis[C]	Commence metronidazole[1-7] and refer to dentist for scaling and oral hygiene advice[C] Use in combination with antiseptic mouthwash if pain limits oral hygiene	Metronidazole[1-7C] Chlorhexidine or hydrogen peroxide	400 mg TDS see above dosing in mucosal ulceration	3 days Until oral hygiene possible
Pericoronitis[1B]	Refer to dentist for irrigation & debridement.[1C] If persistent swelling or systemic symptoms use metronidazole.[1-5A] Use antiseptic mouthwash if pain and trismus limit oral hygiene	Amoxicillin Metronidazole[1-7C] Chlorhexidine or hydrogen peroxide	500 mg[6] TDS 400 mg TDS see above dosing in mucosal ulceration	3 days 3 days Until oral hygiene possible

<table>
<tr><td>Dental abscess[B]</td><td colspan="4">• Regular analgesia should be first option until a dentist can be seen for urgent drainage, as repeated courses of antibiotics for abscess are not appropriate;[1] Repeated antibiotics alone, without drainage are ineffective in preventing spread of infection.
• Antibiotics are recommended if there are signs of severe infection, systemic symptoms or high risk of complications.[2,3]
• Severe odontogenic infections; defined as cellulitis plus signs of sepsis, difficulty in swallowing, impending airway obstruction, Ludwigs angina. Refer urgently for admission to protect airway, achieve surgical drainage and IV antibiotics
The empirical use of cephalosporins,[9] co-amoxiclav, clarithromycin, and clindamycin do not offer any advantage for most dental patients and should only be used if no response to first line drugs when referral is the preferred option.[6,12C]</td></tr>
<tr><td></td><td>If pus drain by incision, tooth extraction or via root canal.[4-7B] Send pus for microbiology.
True penicillin allergy: use clarithromycin or clindamycin[C] if severe.
If spreading infection (lymph node involvement, or systemic signs ie fever or malaise) ADD metronidazole[8-10C]</td><td>Amoxicillin[2] or Phenoxymethylpenicillin[2]
True penicillin allergy:
Clarithromycin
Severe infection add Metronidazole[8-10] or if allergy
Clindamycin alone[3,8-11]</td><td>500 mg[2] TDS
500 mg[2] – 1g QDS
500 mg BD
400 mg TDS
300mg QDS</td><td>Up to 5 days review at 3d [11]
5 days
5 days[11]</td></tr>
</table>

2. SPECIFIC ANTIMICROBIAL AGENTS

• **Oral cephalosporins** should be AVOIDED in respiratory tract infections. Oral cefuroxime axetil produces a higher incidence of C.difficile diarrhoea. Cephalexin has a narrower spectrum than cefuroxime and does not have activity against Haemophilus in COPD. Amoxicillin or doxycycline are the recommended agents in RTIs that need antibiotics. For suspected Mycoplasma infection use doxycycline.
Cephalexin has a place in UTI.

• **Doxycyline** is appropriate therapy for wound infections/cellulitis in patients allergic to penicillins but it is not recommended alone for infections in bone. Avoid tetracyclines (including doxycycline) during breast-feeding, or under the age of 12 years. Remember to avoid giving milk, calcium or magnesium antacids, or iron. Doxycycline is deliberately advised at 100mg bd dose in wound infection because this regimen has proved effective in MRSA clearance and treatment, loading doses are often accidentally omitted and because it is a non-toxic dose in chlamydia infection and patients without established renal impairment.

• Oral **co-amoxiclav** has a similar spectrum to i.v. cefuroxime and metronidazole used after abdominal surgery or in soft tissue infection but should not be used indiscriminately – outbreaks of C difficile associated with over-use are recorded. Metronidazole is not required if this agent is being used. It occasionally is useful as a single antibiotic where mixed faecal flora or mixtures of Staph. aureus (not MRSA) or streptococci, and anaerobes are causing infection. It also may be useful as an alternative to doxycycline in respiratory Haemophilus infections confirmed as resistant to amoxicillin.

• **Flucloxacillin** is useful for wound infections/cellulitis infections. It is not necessary to give penicillin with flucloxacillin, as flucloxacillin will cover streptococci.

• **Macrolide** (erythromycin / clarithromycin / azithromycin) resistance is now commoner than tetracycline resistance in S aureus. Macrolide resistance is commoner than doxycyline resistance in pneumococci, and clarithromycin should only be used alone in pneumonia if Legionella infection is diagnosed by urinary antigen tests.
Clarithromycin 500mg bd can be used instead of Erythromycin to reduce nausea, which causes discontinuation of therapy in 20% of erythromycin patients, but clarithromycin is modestly more expensive in primary care.

• **Ciprofloxacin**: Remember to avoid giving milk/ calcium or magnesium antacids/iron. Moxifloxacin, and levofloxacin have been implicated in C difficile ribotype O27 infections and are not needed for all but exceptional respiratory tract infections. Ofloxacin has inferior activity against Pseudomonas and offers no compensatory advantage. Nalidixic acid has an inferior spectrum and systemic activity to ciprofloxacin.

• Due to increasing levels of resistance, coliforms are now being tested against **Pivmecillinam**. Pivmecillinam is a pro-drug that is metabolised to the active form mecillinam. It is active against many gram-negative bacteria, such as E.coli, Klebsiella and Enterobacter, but it is not active

against Pseudomonas or Proteus. Do not use pivmecillinam empirically, only if advised or indicated on a laboratory report. It is a penicillin so should be avoided in patients with penicillin allergy and it is also contra-indicated in patients with oesophageal stricture, gastro-intestinal obstruction and carnitine deficiency. Patients should be informed that tablets should be swallowed whole with plenty of fluid during meals while sitting or standing.

- **Cotrimoxazole's** use is restricted in primary care to prophylaxis against Pneumocystis.

3. SPECIFIC ORGANISMS

3.1 Clostridium difficile

A significant proportion of cases of Clostridium difficile Infection (CDI) are diagnosed in the community. Many patients have a history of recent hospital admission but some do not. Any antibiotic can be associated with CDI but it is most often associated with carbapenem, cephalosporin and quinolone use. CDI has a wide spectrum of manifestation from mild diarrhoea to severe, potentially fatal colitis. Patients should be reviewed regularly and admission arranged if there are signs of severe disease (>5 type 5-7 stools/day, temperature >38.5°C, hypotension, tachycardia, ileus, abdominal tenderness)

In mild cases, simply stopping aggravating antibiotics is all that is required and if symptoms have settled by the time the result is known then treatment is not required.

- First line treatment is oral metronidazole 400mg tds for 10-14 days
- C. difficile can be detectable in faeces for several weeks and repeat samples are unnecessary. Treat according to symptoms.
- Antibiotic use should be avoided for a minimum of 6 weeks after an episode of CDI or in C.difficile carriers. If there is evidence of another infection that requires treatment during this period then microbiological advice should be sought.
- Up to 20% of cases relapse after resolution of symptoms. Recurrences should be treated promptly with metronidazole or, if the initial illness was severe, oral vancomycin. After a first relapse, the risk of another is increased. Second and subsequent relapses should be treated with vancomycin. Difficult cases should be referred to gastroenterology.

3.2 MRSA

MRSA is increasingly being treated in the community, particularly as it now a requirement that all elective surgical admissions should have an MRSA screen. Clearance should also be considered if MRSA is detected in the community and the patient is not due for admission. All MRSA are resistant to flucloxacillin, co-amoxiclav and cephalosporins. There are also high rates of resistance to erythromycin/clarithromycin and ciprofloxacin. If a patient has been started on a decolonisation regime in hospital, it should be completed after discharge.

- Mupirocin sensitive MRSA decolonisation

    Nose only positive and no lesions: mupirocin 2% nasal ointment (bactroban nasal) 2-3x/day for 5 days

    Lesion positive +/- nose positive: doxycycline 100mg bd AND nasal mupirocin 2-3x/day for 10 days.

If the strain is resistant to doxycycline or it is contraindicated, seek advice.

- Mupirocin resistant MRSA decolonisation

The alternatives to mupirocin are less effective and consequently, mupirocin resistant strains are more difficult to clear. A systemic agent is required as nasal agents alone are seldom successful.

    Neomycin-chlorhexidine nasal ointment (Naseptin) qds AND doxycycline 100mg bd for 10 days

If resistant to one or both agents seek advice about alternatives.

If 2 attempts have been made to clear the patient then further attempts are unlikely to be successful and may lead to the development of more resistant strains. However it might be worth a further attempt if, for example, a wound or pressure sore has healed or skin conditions such as psoriasis are much improved.

For details on management of patients with urinary catheters please see the CCG urinary catheter policy

3.3 ESBL (Extended Spectrum B lactamase) producing coliforms

These Gram-negative organisms are resistant to all cephalosporins and penicillins and usually also to ciprofloxacin, trimethoprim and sometimes gentamicin. We have extensive local experience in treatment. Recurrent infection is frequent and often involves the upper urinary tract. Faecal carriage is prolonged for a number of years as the source of these recurrences and cannot be cleared. Severe infection or if no oral regime available requires treatment with ertapenem 1g od iv which can be given as an outpatient e.g. via DAART.
Oral regimes available if strain resistant to trimethoprim and ciprofloxacin:

- Nitrofurantoin 50mg qds for 10 days (only suitable for lower UTIs)
- 400mg tds pivmecillinam **plus** 375mg tds co-amoxiclav for 5-7 days
- Fosfomycin 3g stat dose in women, in men 2nd 3g dose 3 days later

  Fosfomycin can be accessed in primary care, but it is not currently available as a licensed product and at present the only means of obtaining fosfomycin is to order from a “specials” supplier. There may be a delay in obtaining the product in the community setting of up to 3-5 working days dependent on the supplier and whether held in stock.

4. ANTIBIOTIC ASSAYS FOR PRIMARY CARE

4.1 Teicoplanin assays

The pharmacokinetics of teicoplanin is less predictable than vancomycin.
Contrary to the manufacturers view professional microbiology guidelines in the UK recommend that antibiotic assays for treatment of severe infection should always be performed.
A loading period is essential in the first 24 hours of therapy to ensure adequate levels. The manufacturers recommend that three doses of 400mg are given 12 hours apart and thereafter 400mg is given every 24hrs. An alternative is to give an initial dose of 800mg followed by 400mg every 24 hours.
No local assay service is available and samples are sent away which normally implies a 48 –72 hour turnaround. Assays on Friday and Saturday should be avoided.
Trough levels of teicoplanin should be measured once the patient has had at least 2 teicoplanin doses 24 hours apart. Use a plain red-topped tube.
Levels are not always required with short courses in patients with normal renal function. However they are advised in renal impairment, obesity and those not responding to treatment to ensure appropriate levels. Use in severe renal failure is not recommended as no local assay service is available and the delay in sending samples away compromises correct dosing.
Pre-dose blood levels exceeding 10mg/l are associated with good outcomes in general infections but special situations warrant higher levels. Levels of >20mg/l are required for good prognosis in endocarditis and we would recommend similar levels are achieved when treating prosthetic joint infection.

4.2 Tobramycin levels

Tobramycin is twice as active as Gentamicin against Pseudomonas aeruginosa but in general half as active against other organisms.
Specific susceptibility tests are necessary because antibiotic resistance mechanisms affect both drugs in different and unpredictable ways.
Usually we only recommend tobramycin use in treatment of pseudomonas in bronchiectasis. In general tobramycin is less nephrotoxic than gentamicin but comparable information for ototoxicity is poorly reported.
By analogy with gentamicin, it is likely that high once daily doses are more effective and less toxic than multiple smaller daily doses. The Hartford nomogram based on samples taken 6-14 hours post dosage could be used to ensure dosage is not excessive.
Trough levels are used in paediatrics in cystic fibrosis on once daily dosing, usually for maintenace. These results cannot be relied on to guide therapy in other situations as trough levels are outside the linear part of the calibrated assay and may not reliably detect slight drug accumulation. Levels >1mg/l certainly indicate accumulation although with the reduced toxicity of the parent compound this only certainly indicates some impaired renal clearance.

4.3 Itraconazole and voriconazole levels

When these drugs are used orally for prophylaxis or treatment of life threatening invasive mycoses, particularly aspergillosis, antibiotic levels should be routinely monitored to ensure absorption is adequate. No local service is available and these assays are sent away and batched so a 48-hour to 7-day delay in reporting assays is usual.

Itraconazole

- Should not be given with cyclophosphamide regimens as the drug induces production of toxic cyclophosphamide metabolites. Discuss alternatives with microbiology.
- Grapefruit juice may increase serum levels of Itraconazole in some species but this is not clearly known in man.
- Itraconazole has potent effects on P450 cytochrome enzymes and levels are affected by other p450 cytochrome enzyme inducers. Take care re drug interactions.
- Trough therapeutic levels of Itraconazole should be maintained above 0.5mg/l.

Voriconazole

- Induces falls in cyclosporin A levels and other interactions associated with drug metabolising enzymes are to be expected.
- Voriconazole levels are affected by genetic heterogeneity in drug metabolising enzymes leading to high degree of interpatient variability
- Voriconazole levels should be drawn 12 hours after the last dose after the patient has received at least 5-7 days of consistent therapy.
- Recommended trough level for both efficacy and safety is between 2 and 6 mg/L.

5. PROPHYLAXIS

5.1 Bacterial endocarditis

Preventive dentistry to treat existing dental sepsis should always be undertaken when a new diagnosis of cardiac congenital or valvular disease is made and before insertion of orthopaedic or other prostheses and is the single most important action in prevention of endocarditis. Indeed, **the importance of maintaining good oral health** should be emphasised for all patients.
Current NICE guidelines (2008) state that antibiotic prophylaxis against infective endocarditis is **not** recommended:

- for people undergoing dental procedures
- for 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.

The evidence is poor for prophylaxis in many conditions where prophylaxis has been the standard of care for 50 years and if the incidence of bacteraemia is low, the risks of prophylaxis in superinfection and allergy may outweigh theoretical and observed risks of endocarditis. However, the risk of endocarditis is increased if there is suspected infection at the site of the procedure at the time of operation. If elective urological procedures are to be undertaken, a urine culture should be sent preoperatively. If any culture is positive, seek microbiologist advice on treatment and operative prophylaxis as cephalosporins, quinolones, trimethoprim and nitrofurantoin are unreliable in prophylaxis against enterococci.
The following are regarded as being at risk of infective endocarditis (NICE 2008)

- 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
- previous infective endocarditis
- hypertrophic cardiomyopathy.

Any episodes of infection in people at risk of infective endocarditis should be investigated and treated promptly to reduce the risk of endocarditis developing.
Patients should be made aware of the symptoms that may indicate infective endocarditis and when to seek expert advice as well as the risks of undergoing invasive procedures, including non-medical procedures such as body piercing or tattooing.

5.2 Prosthetic Joints

Comparable to the changes in guidance concerning dental procedures and risk of infective endocarditis, there is no evidence of benefit and antibiotic prophylaxis is not routinely recommended for patients with joint prostheses. However, it is important to maintain good oral hygiene and to avoid dental sepsis.

5.3 Prophylaxis post-splenectomy

Antibiotic prophylaxis

- Not penicillin allergic – advise penicillin V continuously from hospital discharge until at least 16 years old or at least 2 years post splenectomy for patients >16y. Adult dose is 500mg bd. If unwell change to amoxicillin full dose and seek medical advice.
- Penicillin allergic – the evidence of benefit is less good. Adults – advise no prophylaxis; children – consider erythromycin. If unwell seek immediate medical advice.

Life long prophylactic antibiotics should be offered to patients considered at continued high risk of pneumococcal infection

aged <16 years or > 50 years,
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)

Patients not at high risk should be counselled regarding the risks and benefits of lifelong antibiotics and may choose to continue or discontinue prophylaxis.

All patients should carry a supply of appropriate antibiotics for emergency use and advised to seek urgent medical advice if develop symptoms and/or signs of infection

Immunisation

Ideally patients should be vaccinated four to six weeks before elective splenectomy. Where this is not possible, they can be given up to two weeks before surgery. If it is not possible to vaccinate at least two weeks before surgery, or a patient has an emergency splenectomy, vaccination should be delayed until at least two weeks after the operation to obtain a better response.

The immunisations required are listed below. See 'The Green Book' for details on timings and preparations.

Pneumococcal Vaccine

Influenza

Hib/MenC

Quadrivalent Meningococcal (ACWY) polysaccharide vaccine - If hyposplenic or asplenic individuals are travelling to countries with an increased risk of ACW or Y strains of meningococcus eg the Haj, they should receive the ACWY vaccine **in addition** to the MenC vaccine

Other advice

- Avoid malaria
- Note risk of multiresistant pneumococci abroad eg Spain
- Advise antibiotic prophylaxis for animal bites
- Avoid tick bites - in areas where babesiosis endemic e.g. North America
- Carry a medic-alert disc

6. ANTIBIOTIC RESISTANCE RATES

Antibiotic resistance rates for common organisms in Shropshire 2013/14

	Pneumococcus	Haemophilus influenzae	Group A Streptococcus	S.aureus (OP/GP)	S. aureus (IP)
Amoxicillin	-	28.9	-	-	-
Co-amoxiclav	-	7.2	-	-	-
trimethoprim	-	34.3	-	-	-
Penicillin	9.5	-	0	-	-
Doxycycline	15.8	1	4	8.7	9.5
Erythromycin	16.2	-	5.2	12.9	15.3
Flucloxacillin	-	-	0	6.5	9.7

7. REFERENCES

References and grading of guidance recommendations are available on the PHE website