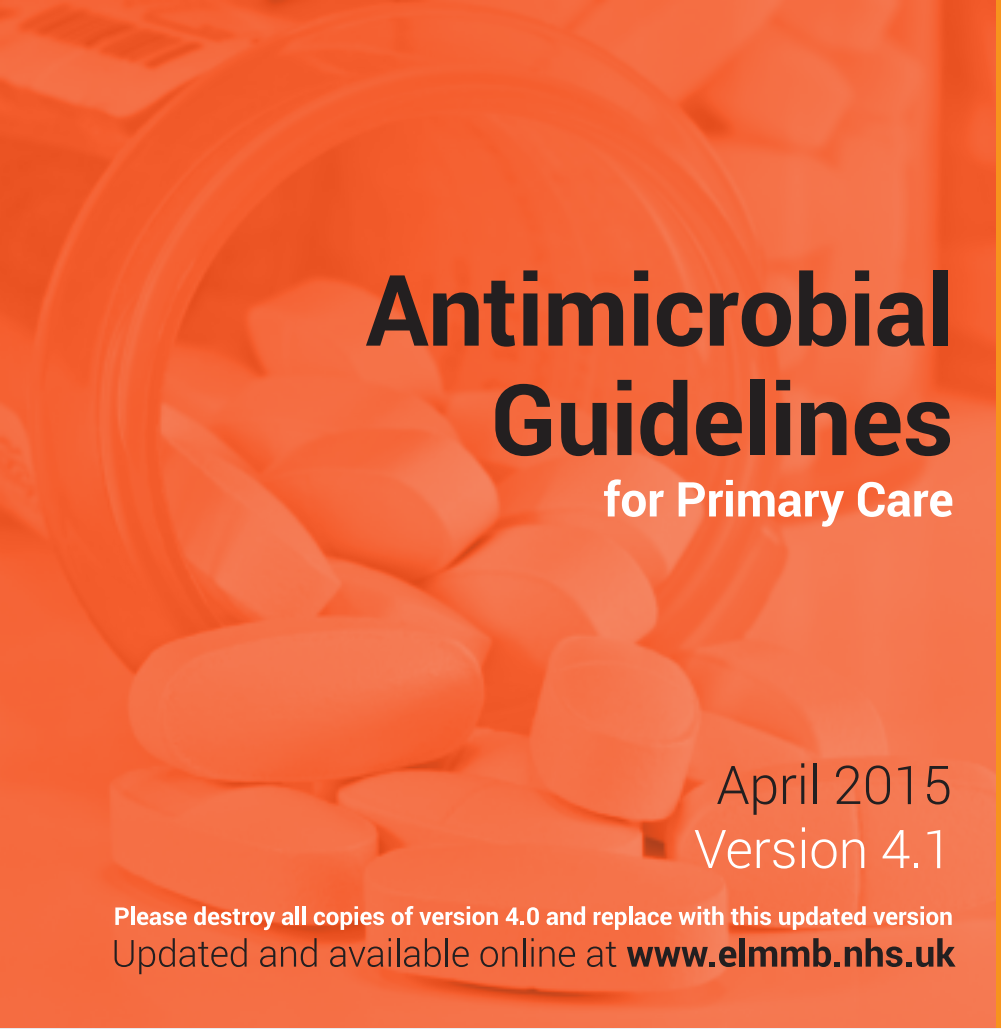

Antimicrobial Guidelines

for Primary Care

April 2015
Version 4.1

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Updated and available online at **www.elmmb.nhs.uk**

Approved for use in
NHS East Lancashire CCG
NHS Blackburn with Darwen CCG

Adapted from the HPA/BIA Management of infection guidance for primary care.

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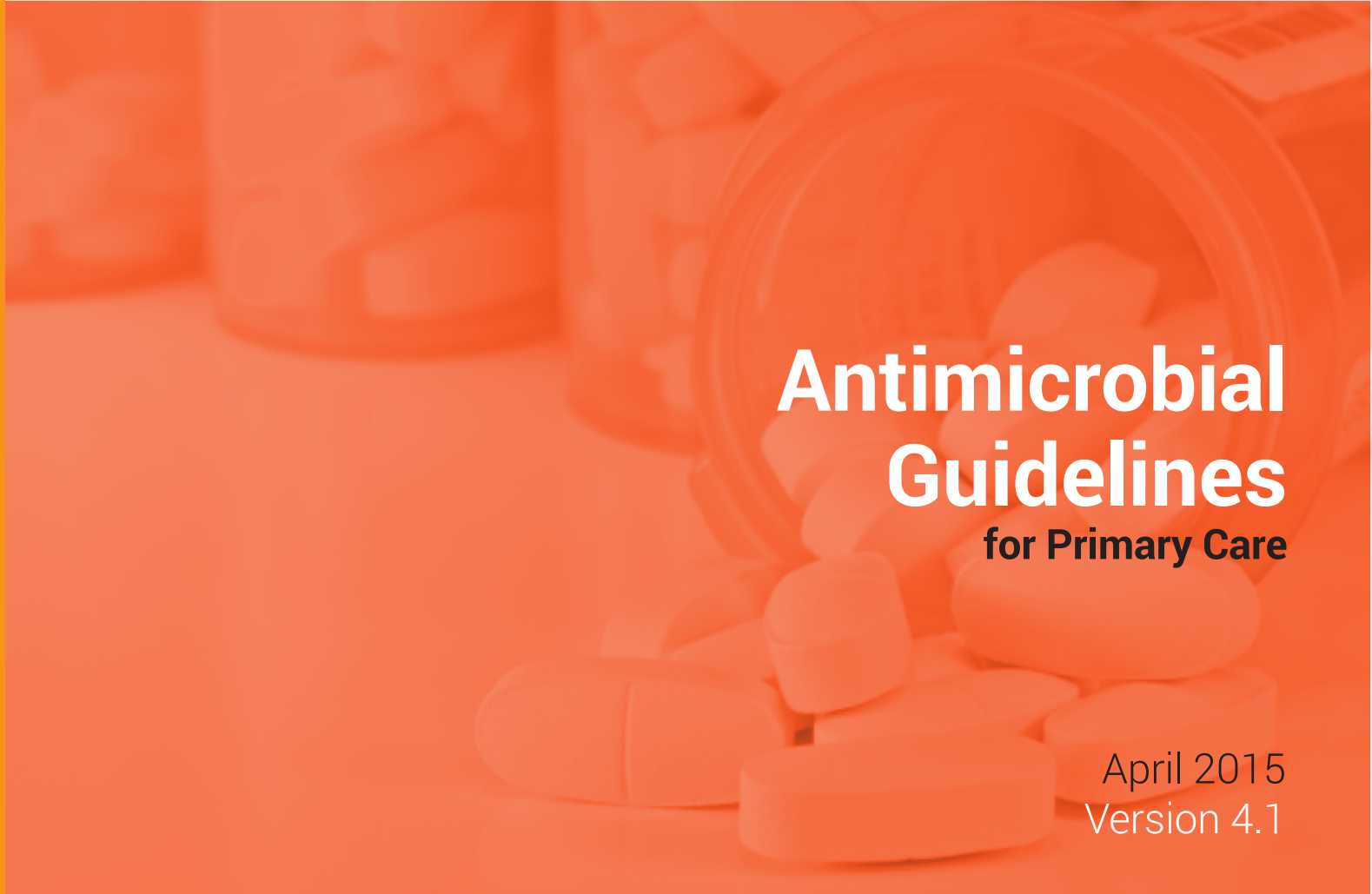

Antimicrobial Guidelines

for Primary Care

April 2015
Version 4.1

East Lancashire Health Economy
Guidelines on the Management of Infections in Primary Care

Aims

- to provide a simple, 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

Principles of Treatment

1. This guidance is based on the best available evidence but professional judgement should be used and patients should be involved in the decision.

2. A dose and duration of treatment for adults is usually suggested, but may need modification for age, weight and renal function. In severe or recurrent cases consider a larger dose or longer course.

3. Lower threshold for antibiotics in immunocompromised or those with multiple morbidities; consider culture and seek advice.

4. Prescribe an antibiotic only when there is likely to be a clear clinical benefit.

5. Consider a no, or delayed, antibiotic strategy for acute self-limiting upper respiratory tract infections.

6. Limit prescribing over the telephone to exceptional cases.

7. Use simple generic antibiotics if possible. Avoid broad spectrum antibiotics (eg co-amoxiclav, quinolones and cephalosporins) when narrow spectrum antibiotics remain effective, as they increase risk of Clostridium difficile, MRSA and resistant UTIs.

8. Avoid widespread use of topical antibiotics *(especially those agents also available as systemic preparations, e.g. fusidic acid).*

9. In pregnancy AVOID tetracyclines, aminoglycosides, quinolones, high dose metronidazole (2g). Short-term use of nitrofurantoin *(at term, theoretical risk of neonatal haemolysis)* is unlikely to cause problems to the foetus. Trimethoprim also unlikely to cause problems unless poor dietary folate intake or taking another folate antagonist such as antiepileptic.

10. We recommend clarithromycin as it has less side-effects than erythromycin, greater compliance as twice rather than four times daily & generic tablets are similar cost. In children erythromycin may be preferable as clarithromycin syrup is twice the cost.

11. Where a 'best guess' therapy has failed or special circumstances exist, microbiological advice can be obtained from:
- **Public Health England** 0344 225 0602
- **Consultant Microbiologists at East Lancashire Hospitals NHS Trust *(including out of hours)***
  Blackburn - **01254 263555** *(Switchboard)*
  Burnley - **01282 425071** *(Switchboard)*

Clostridium Difficile Infection: Best practice in antimicrobial drug prescribing

Clostridium difficile infection (CDI) is associated with antimicrobial use. Prescribing antimicrobials wisely can reduce the incidence.

Clostridium difficile infection (CDI)

- *C. difficile* is a bacterium present in the gut flora in some people.
- Antimicrobials disturb the balance of the gut flora, allowing *C. difficile* to multiply and cause infection.
- Symptoms of CDI can vary from mild diarrhoea to fatal bowel inflammation.
- *C. difficile* spores are shed in the faeces. The spores can survive for long periods in the environment. If ingested, they can transmit infection to others.

Prudent antimicrobial prescribing

- Only prescribe antimicrobials when indicated by the clinical condition of the patient or the results of microbiological investigation.
- Do not prescribe antimicrobials for sore throat, coughs and colds in patients at low risk of complications.
- Consider delayed prescriptions in case symptoms worsen or become prolonged.
- If an antimicrobial is required, follow local guidelines.
- Choose a narrow-spectrum agent where possible and prescribe a short course.
- Generally, no more than 5-7 days treatment is required.
- Three-day courses are appropriate in some cases.
- Broad-spectrum antimicrobials should be reserved for the treatment of serious infections when the pathogen is not known.

Antimicrobials to avoid where possible

The antimicrobials most strongly associated with CDI are:

- Second and third generation cephalosporins: cefaclor, cefuroxime, cefixime and cefpodoxime are examples for oral use
- Clindamycin
- Quinolones ***(associated with the virulent 027 strain of C. difficile):*** ciprofloxacin, levofloxacin, moxifloxacin, ofloxacin, norfloxacin.
- Long courses of amoxicillin, ampicillin, co-amoxiclav or co-fluampicil.

Antimicrobials to choose

- All antimicrobials are associated with CDI, but those with lower risk are trimethoprim, penicillin V, tetracyclines and aminoglycosides.
- If antimicrobials are required, prescribe a short course and follow the local formulary.
- Where therapy has failed or there are special circumstances, obtain advice from a local microbiologist.

CDI and primary care

- CDI has commonly been associated with hospital stay but it is being recognised that many cases originate in the community, due to indiscriminate use of antibiotics.
- Patients most at risk are the elderly, particularly if they have medical conditions and are in close contact with others, e.g. in a care home, residential treatment centre or hospital.

How we use antimicrobials affects the whole community

Which patients are most at risk of CDI?

Patients are more at risk of CDI if they are:

- Elderly
- Suffering from severe underlying diseases
- Immunocompromised
- In an environment where they are in close contact with one another *(e.g. in a care home)*, particularly if hygiene is lacking.

Other factors that increase the risk of CDI are:

- Use of antimicrobials
- Recent gastrointestinal procedures
- Presence of a nasogastric tube

The use of proton pump inhibitors (PPIs) might increase the risk of CDI. Only prescribe PPIs when indicated.

Reducing the risk of CDI

Prudent antimicrobial prescribing

- Broad-spectrum antimicrobials are strongly associated with CDI.

Isolating infected patients

- Isolating patients with CDI reduces the spread of infection in places where people are in close contact with one another.

Good hygiene

- Everyone should wash their hands with soap and water before and after each contact with a CDI-infected patient, including at home.
- Alcohol gel is effective against MRSA but not against *C. difficile* spores.
- The National Patient Safety Agency's Clean Your Hands campaign has been rolled out to primary care - see **www.npsa.nhs.uk/cleanyourhands**
- Carers of CDI-infected patients should wear gloves and aprons.

When can broad-spectrum antibiotics be recommended?

There are few indications for broad-spectrum cephalosporins or quinolones in primary care. The following situations are the only indications for their first-line use.

Acute pyelonephritis	Co-amoxiclav *(or ciprofloxacin in penicllin allergy)*
Simple gonorrhoea *(refer to GUM)*	Cefixime or ciprofloxacin single dose
Animal bite or human bite	Co-amoxiclav
Suspected meningitis in penicillin-allergic patient	Cefotaxime
Pelvic Inflammatory Disease	Ofloxacin *(with metronidazole)*
Prostatitis	Ciprofloxacin or Ofloxacin

When using broad spectrum antimicrobials, counsel patients at risk to be alert for signs of CDI and to stop their antimicrobial and seek medical help if diarrhoea develops.

Bottom line

Clindamycin and broad spectrum antimicrobials are associated with CDI.

Don't prescribe antimicrobials when they're not needed.

If an antimicrobial is indicated, prescribe a short course of a narrow-spectrum agent at the appropriate dose, as outlined in the PCT antimicrobial formulary.

Acknowledgement: UKMi Academic Detailing Aid. October 2008.
Supporting Medicines Q&A documents available at **www.nelm.nhs.uk/en/NeLM-Area/Evidence/Medicines-Q--A/**
Date of preparation: October 2008

Respiratory Tract Infections

At the first face-to-face contact in primary care, including walk-in centres and emergency departments, offer a clinical assessment, including: history (presenting symptoms, use of over-the-counter or self medication, previous medical history, relevant risk factors, relevant comorbidities) and examination as needed to establish diagnosis. Address patients' or parents'/carers' concerns and expectations when agreeing the use of the three antibiotic strategies: No prescribing, Delayed Prescribing or Immediate Prescribing.

For all patients with acute otitis media, acute sore throat/acute pharyngitis/acute tonsillitis, common cold, acute cough/acute bronchitis or acute rhinosinusitis stratify management depending on level of risk of complications

Lower risk of complications

Agree a no antibiotic or delayed antibiotic prescribing strategy for patients with acute otitis media, acute sore throat/acute pharyngitis/acute tonsillitis, common cold, acute rhinosinusitis or acute cough/acute bronchitis. If all patients with an upper respiratory tract infection were treated with an antibiotic, it would be necessary to treat over 4000 patients with an antibiotic to prevent one case of pneumonia.

No antibiotic prescribing

Offer patients:

- reassurance that antibiotics are not needed immediately because they will make little difference to symptoms and may have side effects, for example, diarrhoea, vomiting and rash. For every 17 patients treated with an antibiotic, one will suffer a side effect such as vomiting, rash or diarrhoea, which could be as debilitating as the illness they originally presented with.
- a clinical review if the RTI worsens or becomes prolonged. Give advice on the average natural length of illness – see below.

Delayed antibiotic prescribing

Offer patients:

- reassurance that antibiotics are not needed immediately because they will make little difference to symptoms and may have side effects, for example, diarrhoea, vomiting and rash. For every 17 patients treated with an antibiotic, one will suffer a side effect such as vomiting, rash or diarrhoea, which could be as debilitating as the illness they originally presented with.
- advice about using the delayed prescription if symptoms do not settle or get significantly worse. Give advice on the average natural length of illness – see opposite.
- advice about re-consulting if symptoms get significantly worse despite using the delayed prescription.

The delayed prescription with instructions would be better collected at a later date – but could be given to the patient at the time of consultation.

Respiratory Tract Infections *(continued)*

Intermediate risk of complications

No antibiotic, delayed antibiotic as outlined opposite.

Consider immediate antibiotic prescribing

Depending on clinical assessment of severity, also consider an immediate prescribing strategy for:

- children younger than 2 years with bilateral acute otitis media
- children with otorrhoea who have acute otitis media
- patients with acute sore throat/acute pharyngitis/acute tonsillitis when three or more Centor criteria are present. Centor criteria are: presence of tonsillar exudate, tender anterior cervical lymphadenopathy or lymphadenitis, history of fever and an absence of cough.

Higher risk of complications

Immediate antibiotic prescribing or further investigation and/or management

Offer immediate antibiotics or further investigation/management for patients who:

- are systemically **very** unwell
- have symptoms and signs suggestive of serious illness and/or complications (particularly pneumonia, mastoiditis, peritonsillar abscess, peritonsillar cellulitis, intraorbital or intracranial complications)
- are at high risk of serious complications because of pre-existing comorbidity. This includes patients with significant heart, lung, renal, liver or neuromuscular disease, immunosuppression, cystic fibrosis, and young children who were born prematurely
- are older than 65 years with ACUTE COUGH and two or more of the following:
  hospitalisation in previous year • type 1 or type 2 diabetes • history of congestive heart failure • current use of oral glucocorticoids • older than 80yrs

Offer all patients:

Advice about the usual natural history of the illness and average total illness length:

- acute otitis media: **4 days**
- acute sore throat/acute pharyngitis/acute tonsillitis: **1 week**
- common cold: **1 week**
- acute rhinosinusitis: **2 weeks**
- acute cough/acute bronchitis: **3 weeks**
- advice about managing symptoms including fever *(particularly analgesics and antipyretics).*

For information about fever in children younger than 5 years, refer to 'Feverish illness in children' (NICE clinical guideline CG 160).

Illness	Drug	Dose	Duration of Tx
Pharyngitis/sore throat/tonsillitis Ref: CKS, SIGN **Avoid antibiotics routinely** as 90% resolve in 7 days without, and pain only reduced by 16 hours. If 3 or 4 of the following are present ***(Lymphadenopathy; No Cough; Fever; Tonsillar Exudate)*** consider immediate antibiotics. Antibiotics to prevent Quinsy NNT >4000 Antibiotics to prevent Otitis media NNT= 200	***First line*** Penicillin V *(= Phenoxymethylpenicillin)*	1gram twice daily or 500mg four times daily if severe	**10 days**
	If allergic to penicillin Clarithromycin	500mg twice daily	**10 days**
Otitis media *(child doses)* Use ibuprofen or paracetamol as well Ref: CKS OM **Avoid antibiotics routinely** as 60% are better in 24 hours without: they only reduce pain at 2 days *(NNT=15)* **and do not prevent deafness.** Consider immediate antibiotics if either: < 2yrs with bilateral otitis media *(NNT=4)* or All ages with otorrhoea *(NNT=3)*	***First line*** Amoxicillin	40mg/kg/day in 3 divided doses (total divided into 3 doses) Maximum 1g three times daily	**5 days**
	Second line *or if allergic to penicillin* Clarithromycin (Haemophilus is an extracellular pathogen, thus macrolides, which concentrate intracellularly, are less effective treatment)	Child 1 month-12 years dose by body weight **< 8kg** 7.5mg/kg twice daily **8-11kg** 62.5mg twice daily **12-19kg** 125mg twice daily **20-29kg** 187.5mg twice daily **30-40kg** 250mg twice daily **12-18 years** 250mg twice daily	**5 days**
Rhinosinusitis, acute or chronic Ref: CKS **Avoid antibiotics** as 80% resolve in 14 days without, and they only offer marginal benefit after 7 days *(NNT=15)* **Use adequate analgesia.** Consider 7-day delayed or immediate antibiotic when purulent nasal discharge *(NNT=8)* In persistent infection use an agent with anti-anaerobic activity eg. coamoxiclav.	***First line*** Amoxicillin	500mg three times daily or 1gram three times daily if severe	**7 days**
	Second line Doxycycline	200mg on first day, then 100mg daily	**7 days**
	If unable to use doxycycline, or if persistent symptoms Co-amoxiclav	625mg three times daily	**7 days**
Acute cough, bronchitis Ref: CKS[6] NICE 69 Antibiotic little benefit if no co-morbidity. Consider immediate antibiotics if older than 65 years with ACUTE COUGH and two or more of the following: • hospitalisation in previous year • type 1 or type 2 diabetes • history of congestive heart failure • current use of oral glucocorticoids • older than 80yrs. Symptom resolution can take 3 weeks. For other patients consider 7-14 day delayed antibiotic with symptomatic advice/leaflet.	***First line*** Amoxicillin	500mg three times daily	**5 days**
	Second line *or if allergic to penicillin* Doxycycline	200mg on first day, then 100mg daily	**5 days**

Illness	Comments	Drug	Dose	Duration of Tx
Other 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.*				
Influenza (Ref: PHE Influenza) ***For prophylaxis see:*** NICE Influenza	Annual vaccination is essential for all those at risk of influenza. For otherwise healthy adults, antivirals are not recommended. **Post Exposure Prophylaxis:** Offer post exposure prophylaxis to patients in the same household/residential setting as an index case IF: only when the Department of Health states that influenza is circulating in the community, and in one of the 'At Risk' groups: 65 years or over, chronic respiratory disease *(including COPD and asthma)* significant cardiovascular disease *(not hypertension)*, immunocompromised, diabetes mellitus, chronic renal disease and chronic liver disease , AND patients have not been vaccinated, and prophylaxis offered within 36 hours of contact with an index case for zanamivir and within 48 hours of contact for oseltamivir. Give oseltamivir 75mg capsule orally daily for 10 days, or zanamivir 10mg *(2 inhalations by diskhaler)* daily for 10 days. NB. Oseltamivir is first line for prophylaxis and treatment unless the patient is severely immunocompromised in which case zanimivir should be used in line with its product licence. **Treatment of Influenza:** Offer influenza treatment to patients only when the Department of Health states that influenza is circulating in the community, are 'At Risk' as defined above, AND patients have not been vaccinated, and treatment offered within 48 hours of onset. Give oseltamivir 75mg capsule orally twice daily for 5 days, or zanamivir 10mg *(2 inhalations by diskhaler)* twice daily for 5 days.			
Infected exacerbation of COPD (Ref: NICE 101, GOLD)	Treat exacerbations promptly with oral steroids, and only add antibiotics if purulent sputum **and either** increased shortness of breath (SOB) **and/or** increased sputum volume present. If increased SOB and no purulent sputum, then consider oral steroids without antibiotics. *Risk factors for antibiotic resistant organisms include co-morbid disease, severe COPD, frequent exacerbations, antibiotics in last 3 months.* *Rescue courses of antibiotics should only be issued as acute prescriptions and should not be on repeat.*	***First line*** Amoxicillin	500mg three times daily	**5 days**
		First line alternative Doxycycline	200mg on first day, then 100mg daily	**5 days**
		If allergic to penicillin & unable to use doxycycline Clarithromycin	500mg twice daily	**5 days**
		If resistance risk factors: Co-amoxiclav	625mg three times daily	**5-7 days**
Community-acquired pneumonia - ONLY when treatment in the community is appropriate (Ref: BTS 2009 Guideline)	Use CRB65 score to help guide and review: Each scores 1 point: Confusion (AMT<8) Respiratory rate >30/min BP systolic <90 BP diastolic <60 Age >65 Add scores up: Score 0: suitable for home treatment; Score 1-2: hospital assessment or admission **Score 3-4: urgent hospital admission** Give immediate IM benzylpenicillin or amoxicillin 1G orally if delayed admission/life threatening. Mycoplasma infection is rare in over 65s.	IF CRB65=0: amoxicillin or clarithromycin or doxycycline	500mg three times daily 500mg twice daily 200mg on first day, then 100mg daily	**7 days** **7 days** **7 days**
		IF CRB65=1 & AT HOME: amoxicillin or clarithromycin or doxycycline	500mg three times daily 500mg twice daily 200mg on first day, then100mg daily	**7-10 days** **7-10 days** **7-10 days**

Illness	Comments	Drug	Dose	Duration of Tx
Meningitis				
Suspected meningococcal disease (Ref: HPA pdf) NICE CG102	Transfer all patients to hospital immediately. **IF time before admission, give IV benzylpenicillin unless hypersensitive (i.e history of difficulty breathing, collapse, loss of consciousness, or rash)**	IV (or IM) Benzylpenicillin	Adults and children 10 years & over: 1200mg Children 1 - 9 years: 600mg Children <1 year: 300mg	
	If history of allergy to penicillin	IV (or IM) Cefotaxime injection	Adult: 1g, Child 12 - 18 yrs: 1g, Child 1month - 12 yrs: 50mg/kg (max 1g), Neonate: 50mg/kg	
Prevention of secondary case of meningitis: Only prescribe following advice from Pubic Health England: See front page for contact numbers.				
Urinary Tract Infections: (Ref: HPA UTI quick reference guidance, ESBLs, www.cks.nhs.uk, NICE)				
Note: Amoxicillin resistance is common, therefore ONLY use if culture confirms susceptibility. In the elderly (>65 years), do not send urine for culture in asymptomatic patients with a positive dipstick. Do not treat asymptomatic bacteriuria in the elderly; it occurs in 25% of women and 10% of men and is not associated with increased morbidity . 'Smelly'urine is NOT a symptom. Dipstick tests are NOT recommended in the absence of symptoms and such tests should not routinely be performed. In the presence of a catheter, antibiotics will not eradicate bacteriuria; only treat if systemically unwell or pyelonephritis likely. Cefalexin is NOT included as a second line agent – risk of Clostridium difficile with cefalexin is high. Do not use prophylactic antibiotics for catheter changes unless history of catheter-change-associated UTI.				
Uncomplicated UTI **i.e. no fever or flank pain in men or women** (Ref: PHE URINE, SIGN, CKS Women, CKS Men)	Women with severe/≥ 3 symptoms: treat. Women with mild/≤ 2 symptoms: use dipstick to guide treatment. Nitrite & blood/leucocytes has 92% positive predictive value ; negative nitrite, leucocytes, and blood has a 76% negative predictive value. Men: send pre-treatment MSU OR if symptoms mild/ non-specific, use negative nitrite and leucocytes to exclude UTI. There is less relapse with trimethoprim than cephalosporins. Trimethoprim must NOT be used in patients taking Methotrexate. Community multi-resistant *E. coli* with Extended spectrum Beta-lactamase enzymes **(www.hpa.org.uk/ infections/topics_az/esbl/default.htm)** are increasing so perform culture in all treatment failures. ESBLs are multi-resistant but may retain sensitivity to nitrofurantoin	***First line*** Trimethoprim OR Nitrofurantoin*	 200mg twice daily 100mg modified release capsules twice daily	 **3 days** (Give a 7 day course in men) **3 days** (Give a 7 day course in men)
		Second line depends on susceptibility of organism isolated e.g. Nitrofurantoin, Amoxicillin or Co-amoxiclav		
		*Nitrofurantoin is now contraindicated in patients with an estimated glomerular filtration rate (eGFR) of less than 45 ml/min/1.73m2. However, a short course (3 to 7 days) may be used with caution in certain patients with an eGFR of 30 to 44 ml/min/1.73m2. Only prescribe to such patients to treat lower urinary tract infection with suspected or proven multidrug resistant pathogens when the benefits of nitrofurantoin are considered to outweigh the risks of side effects. This contraindication allows nitrofurantoin to be used in patients for whom it was previously not recommended. MHRA DSU Vol 8 Iss 2 9/14 Nitrofurantoin modified release (m/r) capsules		
Uncomplicated UTI Resistant coliforms based on culture and sensitivity under Microbiologist advice only.	**Amber traffic light - under microbiologist advice.**	**Pivmecillinam**	400mg stat then 200mg three times daily.	**3 days**

Illness	Comments	Drug	Dose	Duration of Tx
Urinary Tract Infections: (Ref: HPA UTI quick reference guidance, ESBLs, www.cks.nhs.uk, NICE) ***Continued...***				
Multi-Drug Resistant UTI	**Treatment only NOT Prophylaxis** There has been a steady increase in the prevalence of Multi-Drug resistant infections isolated during culture and sensitivity testing for UTI's. In symptomatic patients who are clinically unwell, treatment to prevent bacteraemia is indicated. Whilst nitrofurantoin is often used it is limited by the need for patients to have a creatinine clearance >45ml/min*	**Fosfomycin** Only to be used with microbiologist approval in line with the fosfomycin protocol available @ www.elmmb.co.uk	**MEN 2 x 3g sachet** ONE sachet in a glass of water. Repeat dose after 3 Days. Take at least two hours before or after food **WOMEN 1 x 3g sachet** The contents of ONE sachet as a SINGLE dose.Take at least two hours before or after food.	
UTI in pregnancy (Ref: PHE URINE, CKS)	Send MSU for culture & sensitivity and start empirical antibiotics. Short-term use of nitrofurantoin in pregnancy is unlikely to cause problems to the foetus. Avoid near term where possible. Avoid trimethoprim if low folate status or on folate antagonist (eg antiepileptic or proguanil). Give folic acid if used in first trimester. Trimethoprim must NOT to be used in patients taking Methotrexate	***First or second trimester*** Nitrofurantoin ***Second or third trimester*** Trimethoprim ***Use the other first line agent if suitable,*** or amoxicillin if sensitive.	100mg modified release capsules twice daily 200mg twice daily (unlicensed) 500mg three times daily	**7 days** **7 days** **7 days**
Children - Urinary tract infection - Diagnosis & Referral or Treatment strategy (Ref: CG54) NICE Clinical Guideline. Urinary tract infection in children: diagnosis, treatment and long-term management.	Infants and children with symptoms and signs suggestive of urinary tract infection (UTI) should have a urine sample tested for infection. Those presenting with unexplained fever of 38°C or higher should have a urine sample tested within 24 hours. The table on below is a guide to the symptoms and signs that infants and children present with. Table 1 ***Presenting symptoms and signs in infants and children with UTI***			

Age group		Most Common — Symptoms and signs — Least Common		
Infants younger than 3 months		Fever, Vomiting, Lethargy, Irritability	Poor feeding, Failure to thrive	Abdominal pain, Jaundice, Haematuria, Offensive urine
Infants & children, 3 months or older	**Preverbal**	Fever	Abdominal pain, Vomiting, Loin tenderness, Poor feeding	Lethargy, Irritability, Haematuria, Offensive urine, Failure to thrive
	Verbal	Frequency, Dysuria	Dysfunctional voiding, Changes to continence Abdominal pain, Loin tenderness	Fever, Malaise, Vomiting Haematuria, Offensive urine Cloudy urine

However, infants and children with an alternative site of infection should not have a urine sample tested routinely. When infants and children with an alternative site of infection remain unwell, urine testing should be considered after 24 hours at the latest.
In an infant or child with a high risk of serious illness it is highly preferable that a urine sample is obtained; however, treatment should not be delayed if a urine sample is unobtainable.

* may be used with caution as short-course therapy only for the treatment of uncomplicated lower urinary tract infection in individual cases with an eGFR between 30-44 ml/min to treat resistant pathogens, when the benefits are expected to outweigh the risks.

Illness	Comments	Drug	Dose	Duration of Tx
Children - Urinary tract infection - Diagnosis & Referral or Treatment strategy Continued	A clean catch urine sample is the recommended method for urine collection. The following risk factors for UTI and serious underlying pathology should be recorded: ■ poor urine flow ■ recurrent fever of uncertain origin ■ family history of vesicoureteric reflux (VUR) or renal disease ■ dysfunctional voiding ■ abdominal mass ■ poor growth ■ history suggesting previous UTI or confirmed previous UTI ■ antenatally-diagnosed renal abnormality ■ constipation ■ enlarged bladder ■ evidence of spinal lesion ■ high blood pressure.			
Children - Lower urinary tract infection - Drug choice in primary care (see above for diagnosis)	**Infants younger than 3 months with a possible UTI should be referred immediately to the care of a paediatric specialist.** Treatment should be with parenteral antibiotics. **For infants and children 3 months or older with acute pyelonephritis/upper urinary tract infection consider referral to a paediatric specialist to be treated with oral antibiotics for 7–10 days.** (The use of an oral antibiotic with low resistance patterns is recommended, for example co-amoxiclav) **For infants and children 3 months or older with cystitis/lower urinary tract infection:** ■ treat with oral antibiotics for 3 days. ■ the parents or carers should be advised to bring the infant or child for reassessment if the infant or child is still unwell after 24–48 hours. If an alternative diagnosis is not made, a urine sample should be sent for culture to identify the presence of bacteria and determine antibiotic sensitivity if urine culture has not already been carried out. Antibiotic prophylaxis should not be routinely recommended in infants and children following first-time UTI. Infants and children who have had a UTI should be imaged. Trimethoprim must NOT be used in patients taking Methotrexate.	***First line*** Trimethoprim	1 month - 18 years 4mg/kg (max 200mg) twice daily	**3 days**
		OR Nitrofurantoin	3 months - 12 years 750micrograms/kg four times daily	**3 days**
		If susceptible, Amoxicillin	1 month - 1 year 62.5mg three times daily 1 - 5 years 125mg three times daily 5 - 18 years 250mg three times daily (All doses can be doubled in severe infections)	**3 days**

Illness	Comments	Drug	Dose	Duration of Tx
Acute pyelonephritis	If admission not needed, send MSU for culture and sensitivities and start antibiotics. **If no response within 24 hours admit.** Trimethoprim must NOT be used in patients taking Methotrexate.	Co-amoxiclav	625mg three times daily	**Review within 48hrs.** Change antibiotics based on sensitivity results.
		If susceptible Trimethoprim	200mg twice daily	**14 days in total**
		Only if allergic to penicillin, Ciprofloxacin	500mg twice daily	**7 days**
Recurrent Post Coital UTI women (≥ 3/yr)	Cranberry products or post coital prophylaxis is as effective as prophylaxis taken nightly.	Nitrofurantoin	50mg - 100mg post coital	**Stat dose post coiltal**
		OR Trimethoprim	100mg post coital	**Stat dose post coiltal**
Recurrent UTI in males and females (≥ 3/yr) excluding children <12 yrs. **NOTE – AMBER TRAFFIC LIGHT**	The use of prophylactic antibiotics for UTIs is actively discouraged in primary care.There is a risk of drug resistance and also increased risk to the patient of aquiring Clostridium Difficile if using long-term antibiotics. The decision to commence prophylaxis should be made in secondary care and only Nitrofurantoin or trimethoprim should be used long-term without consulting a microbiologist.	Nitrofurantoin	50mg - 100mg Once Daily	**Max of 6 months then stop**
		OR Trimethoprim	100mg Once Daily	**Max of 6 months then stop.** After this time only treat when symptomatic.
Gastro-intestinal Tract Infections:				
Eradication of *Helicobacter pylori* (Ref: NICE, Helicobacter Selgrad M et al. Curr Opin Gastroenterol 2009; 25 (6): 549-556. Malfertheiner P et al. Gut 2007; 56:772-81.) Managing symptomatic relapse	Indications for eradication therapy: DU, GU, low grade MALT Lymphoma, atrophic gastritis, ITP, gastric cancer, and iron deficiency, anaemia, first-degree relatives with gastric cancer, long-term NSAID therapy in complicated or uncomplicated DU/GU once healed. Consider 'test and treat' in: persistent uncomplicated dyspepsia. Do not offer eradication for GORD. Do not use clarithromycin or metronidazole if used in the past year for any infection. Failure of first line eradication therapy Alarm upper GI symptoms refer for urgent OGD. Factors causing failure of eradication therapy: antibiotic resistance, compliance, smoking, non-ulcer status. DU relapse: H2RA for 8-12 weeks then retest for H. pylori (urea breath test, stool antigen test). GU relapse: PPI for 4-8 weeks and OGD and biopsy. NUD: trial PPI/H2RA, no response trial of domperidone and lifestyle for dysmotility dyspepsia. Consider referral after first or subsequent treatment failure.	***First Line*** *(and for those on warfarin)* Lansoprazole Clarithromycin Amoxicillin	 30mg twice daily 500mg twice daily 1gram twice daily	**All for 7 days**
		Alternative if allergic to penicillin Lansoprazole *PLUS* Metronidazole *AND* Clarithromycin	 30mg twice daily 400mg twice daily 250mg twice daily	**All for 7 days**
		Second line *(Consider referral to specialist if failed first line treatment)* Omeprazole Bismuthate (DE-NOL tabs) Metronidazole Oxytetracycline hydrochloride	 40mg twice daily 240mg twice daily 400mg twice daily 500mg four times daily	**14 days in relapse or maltoma**

Illness	Comments	Drug	Dose	Duration of Tx
Gastroenteritis (Ref: CKS)	Fluid replacement essential. Antibiotic therapy is not usually indicated as it only reduces diarrhoea by 1-2 days and can cause antibiotic resistance. Refer previously healthy children with acute painful or bloody diarrhoea to exclude E. coli 0157 infection. Antibiotic therapy not indicated unless systemically unwell. If systemically unwell discuss with Consultant Microbiologist. Notify and seek advice on exclusion of patients from Public Health England: See front page for contact numbers.			
Clostridium difficile Ref PHE updated guidance 2013 https://www.gov.uk/government/topics/public-health	***Clostridium difficile*** infection ranges from mild to severe diarrhoea to, more unusually, severe inflammation of the bowel *(known as pseudomembranous colitis)*. People who have been treated with broad spectrum antibiotics *(those that affect a wide range of bacteria)*, people with serious underlying illnesses and the elderly are at greatest risk – over 80% of *Clostridium difficile* infections reported are in people aged over 65 years.**If history and symptoms are indicative of *Clostridium difficile* infection *(e.g. post antibiotic)*, please treat as per *Clostridium difficile* guidelines available at www.elmmb.co.uk and notify the Infection Control Nurse.**			
Clostridium difficile Mild/moderate infections	Stop unnecessary antibiotics and/or PPIs 70% respond to metronidazole in 5 days; 92% in 14 days Monitor symptoms and signs (below) treat with oral vancomycin, review progress closely and/or consider hospital referral if appropriate. Admit if severe: T >38.5; WCC >15, rising creatinine or signs/symptoms of severe colitis	***1st episode*** metronidazole ***2nd episode/severe*** oral vancomycin	400mg TDS 125mg QDS	**10-14 days** **10-14 days**
Traveller's diarrhoea (Ref: CKS)	Only consider standby antibiotics for remote areas or people at high-risk of severe illness with travellers' diarrhoea. If standby treatment appropriate give: ciprofloxacin 500 mg twice a day for 3 days *(private prescription)*. If quinolone resistance high *(e.g. south Asia)*: consider bismuth subsalicylate *(Pepto Bismol)* 2 tablets QDS as prophylaxis or for 2 days treatment			
Threadworms* (Ref: CKS)	Treat all household contacts at the same time PLUS advise hygiene measures for 2 weeks *(hand hygiene, wear pants at night, morning shower)* PLUS **wash sleepwear, bed linen, dust, and vacuum on day one especially beds and bedrooms.**	Mebendazole *(Adults & children over 6 months [offlabel when used <2yrs age]) Avoid if pregnant* Hygiene measures are recommended for those under 6 months of age.	100mg single dose *(A second tablet can be taken after two weeks, if re-infection is suspected)*	**Single dose**
	If a worm is passed please send to laboratory for identification as treatment varies accordingly.			
Genital Tract Infections - UK National Guidelines: (Ref: HPA, Vaginal discharge quick reference guide, BASHH)				
Note: *People with risk factors should be screened for chlamydia, gonorrhoea, HIV, syphilis. Refer individual and partners to GUM service. Risk factors: < 25yrs age, no condom use, recent (<12mth)/frequent change of partner, symptomatic partner.*				
Vaginal candidiasis* (Ref: BASHH, PHE, CKS)	All topical and oral azoles give 75% cure. In pregnancy: avoid oral azole & use intravaginal treatment for 7 days.	Clotrimazole	500mg pessary	**Single dose**
		OR Fluconazole	150mg orally	**Single dose**
Bacterial vaginosis	A 7 day course of oral Metronidazole is slightly more effective than 2g single dose. Avoid 2g single dose in pregnancy/breastfeeding.Topical treatment gives similar cure rates but is more expensive. Treating partners does not reduce relapse.	Metronidazole OR Metronidazole - 0.75% vaginal gel OR Clindamycin - 2% vaginal cream	400mg twice daily or 2g single dose 5g *applicatorful at night* 5g *applicatorful at night*	**7 days** **5 days** **7 days**

***Note: Treatment available via Community Pharmacy**

Illness	Comments	Drug	Dose	Duration of Tx
Chlamydia trachomatis (Ref: HPA, Chlamydia quick reference guide)	Opportunistically screen all aged 15-25yrs. Treat partners and refer to GUM service. Pregnancy or breastfeeding: azithromycin is the most effective option [but off-label]. Doxycycline is contra-indicated. Alternative is 7 day course with erythromycin or amoxicillin. Due to lower cure rate in pregnancy, test for cure 6 weeks after treatment.	Azithromycin	1g stat	**Single dose** *1 hr before or 2 hrs after food*
		OR Doxycycline	100mg twice daily	**7 days**
For Epididymitis in men		Ofloxacin OR Doxycycline	400mg twice daily 100mg twice daily	**14 days** **14 days**
Trichomoniasis (Ref: BASHH, PHE, CKS)	Treat partners simultaneously. In pregnancy/ breastfeeding avoid 2g single dose of Metronidazole. **Topical clotrimazole cream gives symptomatic relief only *(not cure)*.**	Metronidazole Clotrimazole	400mg twice daily or 2g in single dose 100mg pessary	**5-7 days** **6 days**
Pelvic Inflammatory Disease (PID) (Ref: BASHH, CKS)	Essential to test for *N. gonorrhoea (as increasing antibiotic resistance)* and chlamydia. 28% of gonorrhoea isolates now resistant to quinolones *(e.g. ofloxacin)*. If gonorrhoea likely *(partner has it, severe symptoms, sex abroad)* avoid ofloxacin regimen. Microbiological and clinical cure are greater with ofloxacin than with doxycycline. Refer contacts to sexual health clinic.	***First line*** Metronidazole *Plus* Ofloxacin	 400mg twice daily 400mg twice daily	 **14 days** **14 days**
		If gonorrhoea likely Ceftriaxone *Plus* Metronidazole *Plus* Doxycycline	 500mg I/M 400mg twice daily 100mg twice daily	 **Stat** **14 days** **14 days**
Acute prostatitis (Ref: BASHH, CKS)	Send MSU for culture and start antibiotics. 4-wk course may prevent chronic prostatitis Quinolones *(e.g. ciprofloxacin/ofloxacin)* achieve higher prostate levels. Trimethoprim must NOT be used in patients taking Methotrexate.	***First line*** Ciprofloxacin OR Ofloxacin ***Second line*** Trimethoprim	 500mg twice daily or 200mg twice daily 200mg twice daily	 **28 days** **28 days** **28 days**
Chronic prostatitis (Ref: EAU)	A trial of antibiotics may be used as treatment or to aid diagnosis. Given the risks associated with prolonged use of antibiotics patients should only receive a **single course of antibiotics for a maximum period of 6 weeks.**	***First line*** Trimethoprim ***Second line*** Ciprofloxacin	 200mg twice daily 500mg twice daily	 **4-6 weeks** *Single course only* **4-6 weeks** *Single course only*

Illness	Comments	Drug	Dose	Duration of Tx
Skin / 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. Send swabs if recurrent boils/abscesses and specifically ask for PVL testing. This is not routinely tested.				
Impetigo (Ref: CKS)	**As resistance is increasing reserve topical antibiotics for very localised lesions.** **Reserve Mupirocin for MRSA only.** **Do not use topical antibiotics for extensive, severe or bullous impetigo, use oral antibiotics.**	***First line*** Flucloxacillin	500mg four times daily	**5-7 days**
		If allergic to penicillin Clarithromycin	500mg twice daily	**5-7 days**
Eczema (Ref: CKS)	If no visible signs of infection, use of antibiotics (alone or with steroids) encourages resistance and does not improve healing. In eczema with visible signs of infection, use treatment as in impetigo			
Acne Vulgaris (Ref: CKS)	Only consider an oral antibiotic combined with either a topical retinoid or benzoyl peroxide in moderate acne if there is acne on the back or shoulders that is particularly extensive or difficult to reach, or if there is a significant risk of scarring or substantial pigment change. Do not prescribe an oral antibiotic alone. Do not combine a topical and an oral antibiotic. Minocycline is not recommended; it is associated with a greater risk of lupus erythematosus-like syndrome and may cause irreversible pigmentation. Propionibacteria strains resistant to erythromycin are becoming widespread.	***First line*** Tetracycline or Oxytetracycline ***Second line*** Doxycycline or Lymecycline	500mg twice daily 500mg twice daily 100mg daily 408mg daily	Oral antibiotics should be limited to the shortest possible period. If the patient responds may continue for **4 to 6 months**. *(consider reducing the antibiotic dose by half for the latter period)* then **stop completely**.
Rosacea (Ref: BNF 65 13.6)	**Moderate or Severe papulopustular rosacea**	***First line*** Tetracycline or Oxytetracycline ***Second line*** Erythromycin or Lymecycline	500mg twice daily 500mg twice daily 500mg twice daily 408mg daily	Courses usually last 6-12 weeks and may be repeated intermittently
Blepharitis (Ref: CKS)	Good eyelid hygiene is the mainstay of treatment. Only consider prescribing topical antibiotics *(chloramphenicol or fusidic acid)* or an oral tetracycline if there are clear signs of staphylococcal infection or Meibomian gland dysfunction. Antibiotics should be reserved for second-line use when eye-lid hygiene alone is ineffective.			
Leg ulcers (Ref: PHE CKS)	Bacteria will always be present. Antibiotics do not improve healing. Culture swabs and antibiotics are only indicated if there is evidence of clinical infection such as inflammation/redness/cellulitis; increased pain; purulent exudate; rapid deterioration of ulcer or pyrexia. Sampling for culture requires cleaning then vigorous curettage and aspiration. All foot 'ulcers' in patients with known or suspected diabetes should be referred as inpatient or outpatient. Where antibiotics are indicated, treat as per cellulitis guidance above. Review antibiotics after culture results. Refer for specialist opinion if severe infection.			

Illness	Comments	Drug	Dose	Duration of Tx
Cellulitis (Ref: CKS)	If patient afebrile and healthy other than cellulitis, flucloxacillin may be used as single drug treatment. If river or sea water exposure, discuss with microbiologist. **If febrile and ill and IV treatment required, discuss with OPAT specialist nurse at Royal Blackburn Hospital.** If streptococcal infection confirmed, replace flucloxacillin with phenoxymethylpenicillin If Clindamycin is prescribed please ensure that patient is counselled that if they experience any abdominal pain or diarrhoea that they should stop treatment and seek advice immediately due to higher risk of C.difficile infection. In facial cellulitis use co-amoxiclav.	***First line*** Flucloxacillin *Or if streptococcal infection confirmed* Phenoxymethylpenicillin	500mg four times daily 500mg four times daily	**5 days then review.Then continue for at least 48 hours after redness has subsided.**
		If allergic to penicillin Clarithromycin	500mg twice daily	
		Second line *only or if spreading* Clindamycin	300mg - 450mg four times daily	
		ONLY in facial cellulitis use Co-amoxiclav.	625mg three times daily	
Animal bite (Ref: CKS)	Surgical toilet most important. Assess tetanus & rabies risk. Give prophylaxis if cat bite / puncture wound; bite to hand, foot, face, joint, tendon, ligament; immunocompromised / diabetic / asplenic / cirrhotic. Antibiotic prophylaxis advised. Assess HIV/hepatitis B & C risk	***First line*** *animal & human prophylaxis and treatment* Co-amoxiclav	375mg - 625mg three times daily	**7 days**
Human bite (Ref: CKS)		*If allergic to penicillin* Metronidazole PLUS Doxycycline OR Clarithromycin *(human)* and review at 24 & 48 hrs	400mg three times daily 100mg twice daily 500mg twice daily	**7 days** **7 days** **7 days**
Conjunctivitis (Ref: CKS)	Most bacterial infections are self-limiting (64% resolve on placebo). They are usually unilateral with yellow-white mucopurulent discharge.	*If severe* chloramphenicol 0.5% drop and 1% ointment	Drops: 1 drop every 2 hours for the first 48 hours, then one drop to four times daily. Ointment: Apply at night.	**Until 48 hours after resolution**
		Second line fusidic acid 1% gel		
Scabies (Ref: CKS)	Treat all home & sexual contacts within 24hours. Treat whole body from ear / chin downwards and under nails. If under 2yrs or elderly, also face /scalp. Refer also to Scabies guidelines.	Permethrin	5% cream. Apply over whole body and wash off after 12hrs, or leave overnight.	**2 applications one week apart**
Fungal infection of the fingernail or toenail. For children seek advice	Take nail clippings: Start therapy only if infection is confirmed by laboratory. Idiosyncratic liver reactions occur rarely with Terbinafine. It is more effective than the azoles such as itraconazole. If candida or non-dermatophyte infection confirmed, use oral itraconazole.	Superficial infection 5% amorolfine nail lacquer	1-2 times weekly fingers toes	**6 months** **12 months**
		Terbinafine	250mg once daily fingers toes	**6 - 12 weeks** **3 - 6 months**
		Second line Itraconazole	200mg once daily fingers toes	**7 days each mth for 2 months** **7 days each mth for 3 months**

Illness	Comments	Drug	Dose	Duration of Tx
Fungal infection of the skin (Ref: CKS body & groin, CKS foot, CKS Scalp)	Terbinafine is fungicidal, so treatment time shorter than with fungistatic imidazoles. If candida possible, use imidazole. If intractable: send skin scrapings. If infection confirmed, use oral terbinafine/itraconazole. Scalp: discuss with specialist.	Topical 1% terbinafine or topical imidazole *(athlete's foot only)*: topical undecanoates *(e.g. Mycota®).*	Twice daily Twice daily Twice daily	**1-2 week** **for 1-2 weeks after healing *(i.e. 4-6wks)***
Varicella Zoster/ Chicken pox (Ref: CKS)	**If pregnant / breastfeeding / neonate / immunocompromised seek urgent advice re treatment and prophylaxis.** **Chicken pox:** Consider antivirals if they are older than 14 years of age, in severe pain, or on steroids, secondary household case, dense/oral rash or smoker **AND** treatment started <24 hours of onset of rash.	***First line*** Aciclovir	800mg five times a day Child doses (<12yrs) see BNF for Children (www.bnfc.nhs.uk)	**7 days**
Herpes Zoster/ Shingles (Ref: CKS)	**Shingles:** Start an oral antiviral drug within 72 hours of rash onset for anyone over the age of 50 years with shingles, and people of any age with any of the following criteria: ■ Ophthalmic involvement *(seek immediate specialist advice, or refer immediately)*. ■ Immunocompromised *(seek immediate specialist advice regarding treatment, or refer immediately)*. ■ Non-truncal involvement *(e.g. shingles affecting the neck, limbs, or perineum).* ■ Moderate or severe pain. ■ Moderate or severe rash. ■ Ramsey Hunt or eczema If it is not possible to initiate treatment within 72 hours, consider starting an antiviral drug up to 1 week after rash onset, especially if the person is at higher risk of severe shingles or complications *(e.g. continued vesicle formation, older age, or severe pain or immunocompromised).* For pregnant women, seek specialist advice regarding prescribing antiviral treatment in pregnancy. For immunocompetent children with shingles, antiviral treatment is not recommended.	***Second line for shingles only*** *If compliance a problem (as fifteen times the cost)* Famciclovir *(only licensed for treatment of Herpes Zoster (Shingles) in adults)*	750mg once daily for 7 days *(in immunocompromised and only following specialist advice, 500mg three times daily for 10 days)*	**7 days**

Long Term Antibiotics

Whilst generally the prolonged use of antibiotics is discouraged, it is recognised that there are certain clinical scenarios where prescribing antibiotics on a long-term basis may be justified and of clinical benefit. Such scenarios may include (but not limited to) bronchiectasis, cystic fibrosis, low dose macrolides in COPD, prevention of pneumococcal infection in asplenia or in patients with sickle-cell disease. For chronic complicated infections such as osteomyelitis microbiology advice should be sought.

All patients commenced on long-term antibiotics should be reviewed on a regular basis and a clear indication for the treatment should be recorded in the patient's notes.

Doses are for oral administration to adults, unless otherwise stated. Please refer to the BNF for further information.
In pregnancy, and where the benefit of treatment still outweighs the risk, use Erythromycin instead of Clarithromycin.

Available online at **www.elmmb.nhs.uk.**

Antibiotic Allergies

The CCG views drug allergy as a serious patient safety issue

For all patients reporting an adverse reaction to an antibiotic (or any drug), the nature of this should be clearly documented in the patients health records.

Patients commonly report adverse reactions to antibiotics, especially the penicillin group. It is therefore very important to clarify the nature of the adverse reaction.

Patients often report to being "allergic" to an antibiotic, when in fact they experienced a common adverse drug reaction (e.g. diarrhoea or vomiting) rather than an allergic reaction (e.g. rash, angioedema or anaphylaxis). In these cases the benefits of using a penicillin-based regimen probably outweigh the risks.

Crossover allergy

Patients with a true allergy to penicillins should be thought to be allergic to all penicillins. There may also be a crossover allergy to other beta-lactam antibiotics (e.g. cefalexin)

The risk of crossover allergy is reported as 0.5 - 6.5% for cephalosporins, though review of published evidence suggests a much lower chance.

It is important to document whether cephalosporins have been given without adverse effects in "penicillin –allergic" patients for future reference.

Penicillin and beta-lactam antibiotics

Prescribers commonly forget that the following are penicillin antibiotics, and as a consequence they are sometimes prescribed inappropriately in patients with a penicillin allergy:

- **Augmentin®** *(Co-amoxiclav)* contains amoxicillin and clavulanic acid.
- **Magnapen®** *(Co-fluampicil)* contains amoxicillin and flucloxacillin.
  Note: This preparation is not recommended for use locally.

Antimicrobial Guidelines for Primary Care

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Medicine Management Board

www.elmmb.nhs.uk NHS

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