Grŵp Strategaeth Meddyginiaethau Cymru Gyfan
All Wales Medicines Strategy Group

CEPP National Audit

Focus on Antibiotic Prescribing

March 2022

(November 2026 - Updates made throughout to align with the current version of the AWMSG-endorsed 'Primary care antimicrobial guidelines'. See 'Updates' table for more information.)

This document has been prepared by the All Wales Antimicrobial Pharmacist Group (AWAPG) and the All Wales Antimicrobial Guidance Group (AWAGG), with support from the All Wales Prescribing Advisory Group (AWPAG) and the All Wales Therapeutics and Toxicology Centre (AWTTC), and has subsequently been endorsed by the All Wales Medicines Strategy Group (AWMSG).

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1.0 Audit aims

- To promote antibiotic prescribing in accordance with existing guidelines;
- To support clinicians with quality improvement by promoting review of antimicrobial prescribing in their teams.

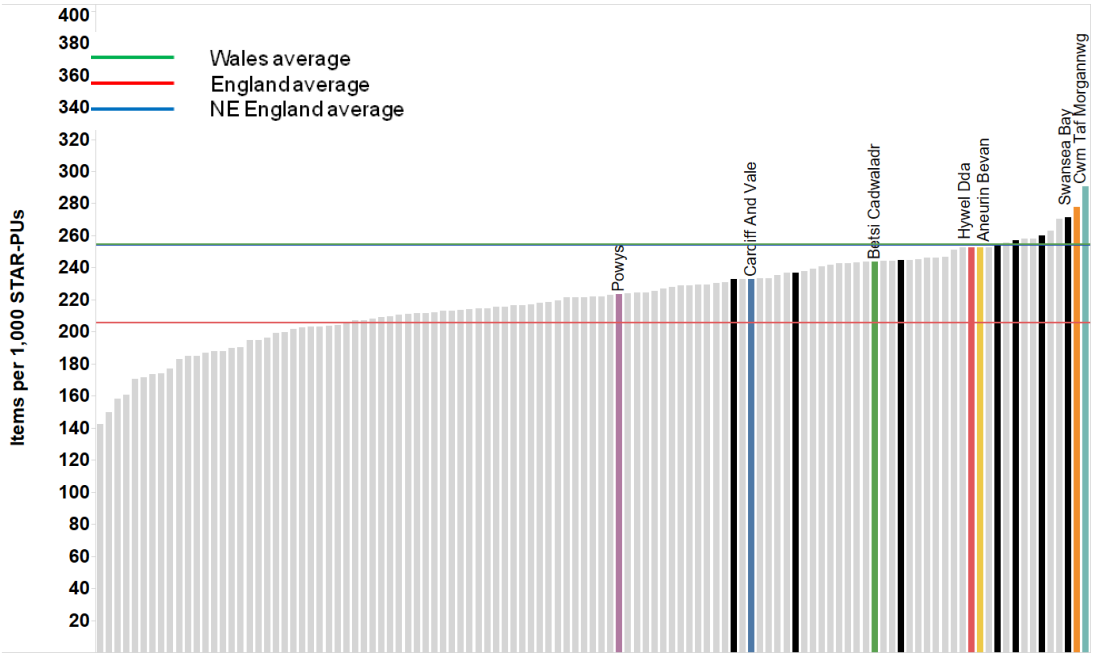
2.0 Background

Where an antibiotic is needed, the choice of agent and its use needs to be considered in order to ensure that infections are treated effectively. Broad-spectrum antibiotics such as fluoroquinolones, cephalosporins and co-amoxiclav should be reserved for the treatment of resistant disease only.

This audit is underpinned by agreed All Wales Medicines Strategy Group (AWMSG) guidelines for the management of infection in primary care, and supports the implementation of the All Wales Medicines Strategy Group (AWMSG) antimicrobial stewardship National Prescribing Indicators (NPIs) which were first introduced in 2014–2015[1,2]. Data for each of the NPIs is available to view (by GP practice, cluster or health board) via the Server for Prescribing Information Reporting and Analysis (SPIRA). Each audit section is available as a standalone document on the AWMSG website.

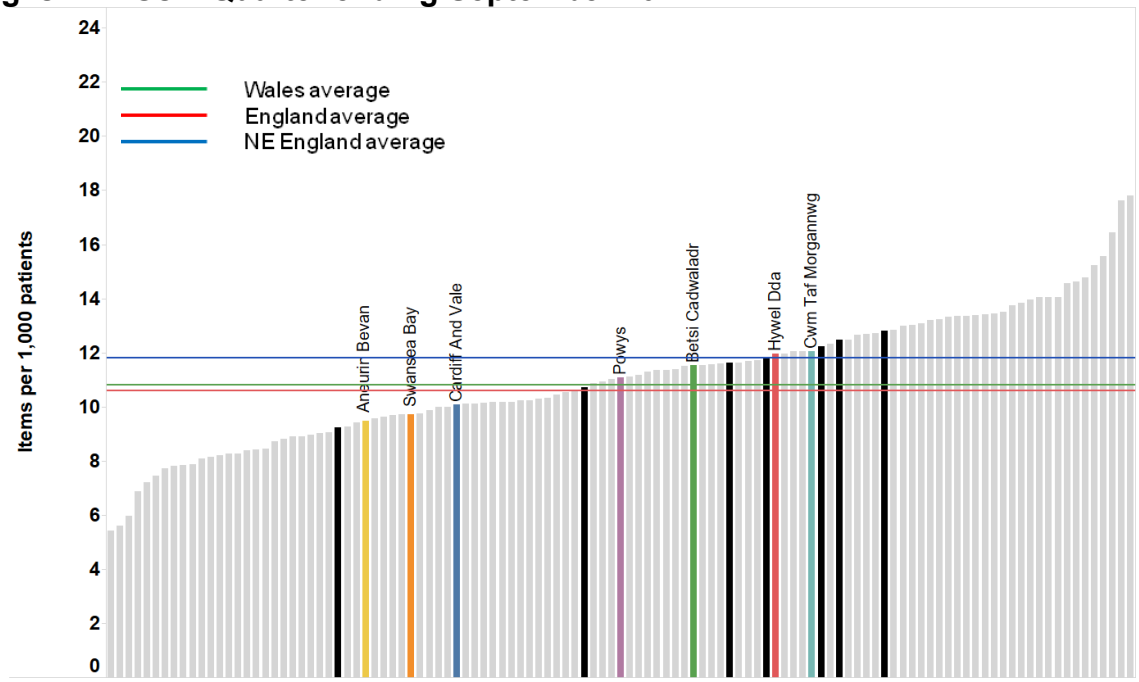
At the time of publication, the total use of antibiotic agents is monitored as an NPI in antibacterial items per 1,000 Specific therapeutic group age-sex related prescribing units (STAR-PUs)[1]. Use is generally high in Wales when compared with England (see Figure 1)[3].

Figure 1. Total antibacterial items per 1,000 STAR-PUs in Welsh health boards and English Clinical Commissioning Groups (CCGs) – Quarter ending September 2021



The term '4C antimicrobials' refers collectively to four broad-spectrum antibiotics, or groups of antibiotics: co-amoxiclav, cephalosporins, fluoroquinolones and clindamycin, The use of simple generic antibiotics and the avoidance of these broad-spectrum antibiotics preserves them from resistance and reduces the risk of *Clostridioides difficile* infection. At the time of publication, the use of 4C antimicrobials is monitored as a separate NPI in 4C antimicrobial items per 1,000 patients[1]. Use in Wales is higher than that observed in England (Figure 2)[3].

Figure 2. 4C antimicrobial items per 1,000 patients in Welsh health boards and English CCGs – Quarter ending September 2021



The audits presented in this document can support the quality improvement required for appraisal and revalidation as described in the General Medicine Council (GMC) guide to Good Medical Practice[4]. In addition, any improvements in prescribing practices that are driven by the completion of these audits and any subsequent re-auditing will help contribute to the UK Government's 20-year vision for antimicrobial resistance, where the ambitions for change include[5]:

- Ambition 4 – Provide safe and effective care to patients
- Ambition 8 – Demonstrate appropriate use of antimicrobials.

Delivery of the UK Government's 20-year vision is being managed through complimentary 5-year action plans. The current action plan for 2019–2024 references modelling studies that suggest that at least 20% of the antibiotics prescribed in UK primary care are inappropriate and sets the following target for delivering "optimal use of antimicrobials in humans"[6,7]:

- To reduce UK antimicrobial use in humans by 15% by 2024, including:
  - a 25% reduction in antibiotic use in the community from the 2013 baseline;
  - a 10% reduction in use of 'reserve' and 'watch' antibiotics in hospitals from the 2017 baseline.

2.1 Key messages for primary care prescribers

The following are key messages for primary care prescribers, based on the key messages developed by the European Centre for Disease Prevention and Control (ECDC)[8]. While these messages were developed some time ago, they are still relevant today:

Growing antibiotic resistance threatens the effectiveness of antibiotics now and in the future

- *Antibiotic resistance is an increasingly serious public health problem in Europe.*
- *While the number of infections due to antibiotic-resistant bacteria is growing, the pipeline of new antibiotics is unpromising, thus presenting a bleak outlook on availability of effective antibiotic treatment in the future.*

Rising levels of antibiotic-resistant bacteria could be curbed by optimising judicious antibiotic use in primary care patients

- *Antibiotic exposure is linked to the emergence of antibiotic resistance. The overall uptake of antibiotics in a population, as well as how antibiotics are consumed, has an impact on antibiotic resistance.*
- *Experience from some countries in Europe shows that reduction in antibiotic prescribing for outpatients has resulted in concomitant decrease in antibiotic resistance.*
- *Primary care accounts for about 80% of all antibiotic prescriptions, mainly for respiratory tract infections.*
- *There is evidence showing that, in many cases of respiratory tract infection, antibiotics are not necessary and that the patients' immune systems are able to combat simple infections.*
- *There are patients with certain risk factors such as, for example, severe exacerbations of chronic obstructive pulmonary disease (COPD) with increased sputum production, for which antibiotics are indicated.*
- *Unnecessary antibiotic prescribing in primary care is a complex phenomenon, but it is mainly related to factors such as misinterpretation of symptoms, diagnostic uncertainty and perceived patient expectation.*

Communicating with patients is key

- *Studies show that patient satisfaction in primary care settings depends more on effective communication than on receiving an antibiotic prescription and that prescribing an antibiotic for an upper respiratory tract infection does not decrease the rate of subsequent return visits.*
- *Professional medical advice impacts patients' perceptions and attitude towards their illness and perceived need for antibiotics, in particular when they are advised on what to expect in the course of the illness, including the realistic recovery time and self-management strategies.*
- *Primary care prescribers are not required to allocate more time for consultations that involve offering alternatives to antibiotic prescribing. Studies show that this can be done within the same average consultation time while maintaining a high degree of patient satisfaction.*[8]

2.2 Supporting tools

- Royal College of General Practitioners (RCGP) Treat Antibiotics Responsibly, Guidance, Education and Tools (TARGET) Antibiotics Toolkit:
  - TARGET – Guides, Updates and News
  - TARGET – Leaflets to share with patients
  - Urinary tract infection (UTI) Resource Suite
  - Leaflets to share with patients
  - Resources for clinical and waiting areas
  - Audit toolkits, self-assessment and action planning
  - Antibiotic and diagnostic quick reference tools
  - Training resources
  - TARGET Trainers and Training
  - Information for commissioners
- AWMSG (2021): Primary Care Antimicrobial Guidelines [*in development*]
- National Institute for Health and Care Excellence (NICE) (2021): Antimicrobial stewardship
- ECDC: Materials for primary care prescribers

3.0 Audit method

The audits below are for the use of health board medicines management teams, cluster pharmacists, practices pharmacists or individual prescribers. A range of criteria is provided to enable users to focus on specific areas of prescribing; it is not envisaged that all audit options would be undertaken in a general practice in one year. It is recommended that this work is carried out by clinicians to enhance ownership and lead to more effective, broader change.

Prescribing data should be considered and a decision reached as to which elements of the tool are most likely to have a positive impact on prescribing practice. This may mean focusing on antibiotic groups, where specific issues are identified, or looking at prescribing in clinical scenarios where number of antibiotic prescriptions is an issue.

3.1 Setting standards

Setting standards is difficult, and reasonable targets for some of the criteria will vary depending on many factors. Completion of the audit to obtain baseline data may assist prescribers in setting more appropriate standards for future audits; however, any re-auditing should demonstrate movement towards the currently suggested standards.

3.2 Sample size

Prescribers should ensure that an adequate number of consultations are analysed to determine compliance with the audit standards and to provide a basis for discussion.

Consider the following:

- If undertaking an in-depth review of a single specific audit section, consider assessing ten cases per prescriber within the practice.
- If undertaking several audit sections, a smaller case selection may be appropriate.
- Ideally, at least 20 consultations should be analysed to determine overall compliance with current guidelines.

- It is recommended that the sample size for a GP practice should scale with the size of the practice patient list size as follows:

GP practice list size	Recommended sample size
< 5,000	20
5,000–7,499	25
7,500–9,999	30
10,000+	35

3.3 Audit data

It is likely that discussing recent antimicrobial prescribing data with health board prescribing advisors would help to ensure that any focus delivers maximum effect.

Health boards are encouraged to include these audits within their Clinical Effectiveness Prescribing Programme (CEPP). For many, this may be a priority due to the impact of healthcare-acquired infection (HCAI) and increasing antimicrobial resistance (with subsequent treatment failure) placing pressure on unscheduled care.

If possible, please send your anonymised audit results to awttc@wales.nhs.org. This will allow the All Wales Therapeutics and Toxicology Centre (AWTTC) to identify any common trends across Wales and cases of best practice in driving improvement.

4.0 Quantity of prescribing – Primary care

4.1 Antibiotic prescribing for sore throat

Background

AWMSG NPI: Antibacterial items per 1,000 STAR-PUs

The development of antibiotic NPIs supports one of the core elements of the Welsh Antimicrobial Resistance Programme: to inform, support and promote the prudent use of antimicrobials.

Information from AWMSG Primary Care Antimicrobial Guidelines:

<table>
<tr><th>Condition</th><th>Comments</th><th>Medicine</th><th>Adult dose</th><th>Duration of treatment</th></tr>
<tr><td rowspan="6">Acute sore throat
NICE CKS (2024)
NICE NG84 (2023)
NICE DG38 (2021)
ESCMID (2012)</td><td colspan="4">Avoid antibiotics as 90% resolve in 7 days without, and pain only reduced by 16 hours.
Antibiotics to prevent quinsy NNT > 4,000
Antibiotics to prevent otitis media NNT 200
Advise paracetamol, or ibuprofen (if suitable). Medicated lozenges may help pain in adults.<table><tr><th>FeverPAIN criteria
(score 1 point each)</th><th>Centor criteria
(score 1 point each)</th></tr><tr><td>Fever (during previous 24 hours)</td><td>Tonsillar exudate</td></tr><tr><td>Purulence (pus on tonsils)</td><td>Tender anterior cervical lymphadenopathy or lymphadenitis</td></tr><tr><td>Attend rapidly (<3 days after onset of symptoms)</td><td>History of fever (over 38ºC)</td></tr><tr><td>Severely Inflamed tonsils</td><td>Absence of cough</td></tr><tr><td>No cough or coryza (inflammation of mucus membranes in the nose)</td><td></td></tr></table></td></tr>
<tr><td>FeverPAIN 0–1 or Centor 0–2:</td><td colspan="2">No antibiotic</td><td rowspan="2">When an antibiotic is not prescribed, please consider using the ‘TARGET Treating your Infection’ leaflet (RCGP), available in multiple languages.</td></tr>
<tr><td>FeverPAIN 2 – 3:</td><td colspan="2">No antibiotic (Back-up delayed antibiotic prescription can be issued if appropriate – please see prescribing options below)</td></tr>
<tr><td rowspan="3">FeverPAIN 4 – 5 or Centor 3 – 4:
Consider back-up/delayed prescription (to be used if symptoms don't improve within 3-5 days) or immediate prescription for antibiotics.</td><td>First line:
Phenoxymethylpenicillin</td><td>500 mg QDS or 1 g BD
(See British National Formulary for Children [BNFc] for dosing in children)</td><td>5 days.
If patient is immunocompromised, confirmed Group A Streptococcus infection or has a problematic recurrence of infection: 10 days.</td></tr>
<tr><td>Penicillin allergy:
Clarithromycin</td><td>250–500 mg BD
(See BNFc for dosing in children)</td><td>5 days</td></tr>
<tr><td>Penicillin allergy and pregnant:
Erythromycin</td><td>250–500 mg QDS or
500 mg–1 g BD</td><td>5 days</td></tr>
</table>

Method

There is a choice of two methods for identifying cases in this audit:

- Method 1 searches by Read Code diagnosis; it therefore identifies all patients who presented with a sore throat. The patients may or may not have received an antibiotic and this method will highlight the choice of antibiotic for sore throat. The figure for percentage of patients receiving antibiotics should be interpreted with caution as this will vary considerably depending on the Read Codes audited.
    - Please note, as and when SNOMED codes are more routinely used across Wales, this document will be updated to include a list of relevant codes.
- Method 2 searches by antibiotic (penicillin) and therefore focuses on patients who have received an antibiotic and the criteria used to inform prescribing

For both methods, only the most recent episode for an individual patient should be considered. Patients with recurrent throat infections should be excluded where another episode has been diagnosed in the previous eight weeks as this may be indicative of treatment failure with first-line treatment. Start the searches using a 3-month window and extend if necessary to reach the required number of cases.

Method 1: Sore throat, search by Read Code diagnosis

Assess a reasonable sample of records with a diagnosis of sore throat (see section on Sample size). To identify the sample, perform a search using an appropriate selection of the following Read Codes:

1C9	Sore throat symptom	H02-3	Throat infection – pharyngitis
1C9-1	Throat soreness	H024	Acute viral pharyngitis
1C92	Has a sore throat	H02z	Acute pharyngitis – NOS
1CB3	Throat pain	H03	Acute tonsillitis
194	Swallowing symptoms	H03-1	Throat infection – tonsillitis
1692	Swollen glands	H03-2	Tonsillitis
A340	Streptococcal sore throat	H031	Acute follicular tonsillitis
H02	Acute pharyngitis	H036	Acute viral tonsillitis
H02-1	Sore throat – not otherwise specified (NOS)	H03z	Acute tonsillitis – NOS
H02-2	Viral sore throat – NOS		

Following the audit, complete the Review Sheet.

Data collection sheet (Method 1)

An Excel version of this data collection sheet is available on the AWTTC website.

Patient ID	Severity assessment		Prescribing strategy taken		If antibiotics prescribed				Patient information
	FeverPAIN or Centor used? • FeverPAIN [FP] • Centor [C] • Neither [Nil]	FeverPAIN or Centor score: (Calculate with information to hand, if not already done)	• No antibiotics offered (usually FP 0–1 or C≤2) [**NIL**] • Back-up delayed prescription (usually FP 2–3) [**BU**] • Immediate prescription (usually FP 4–5 or C 3–4) [**I**]	Decision to prescribe/not to prescribe in line with guidelines OR deviation justified? • Yes [Y] • No [N]	Antibiotic choice (including dose, frequency and duration)	Antibiotic choice correct? • Yes [Y] • No [N]	Dose and frequency correct? • Yes [Y] • No [N]	Duration correct? • Yes [Y] • No [N]	Patient given information leaflet or signposted to information? • Yes [Y] • No [N]
Total	**FP**	**C**	**Nil**	**Nil**	**BU**	**I**	**Yes**		**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
%													
Standard							**100%**		**100%**	**100%**	**100%**		

Method 2: Sore throat, search by antibiotic (penicillin)
Search for adults and children issued phenoxymethylpenicillin (Penicillin V) and identify the cohort prescribed for throat infection (see section on Sample size).
Following the audit, complete the Review Sheet.

Data collection sheet (Method 2)
An Excel version of this data collection sheet is available on the AWTTC website.

Patient ID	Severity assessment		Prescribing strategy taken			Prescribed dose and duration	
	FeverPAIN or Centor used? • FeverPAIN [FP] • Centor [C] • Neither [Nil]	FeverPAIN or Centor score: (Calculate with information to hand, if not already done)	Back-up delayed prescription issued (usually FP 2–3)]? • Yes [Y] • No [N]	Immediate antibiotic given (usually FP 4–5 or C 3–4)? • Yes [Y] • No [N]	Decision to prescribe antibiotic in line with guidelines OR deviation justified? • Yes [Y] • No [N]	Dose and frequency correct? • Yes [Y] • No [N]	Duration correct? • Yes [Y] • No [N]
Total	FP	C	Nil		Yes	Yes	Yes	Yes	Yes
%									
Standard						100%	100%	100%	

4.2 Antibiotic prescribing for acute rhinosinusitis

Background

AWMSG NPI: Antibacterial items per 1,000 STAR-Pus

The development of antibiotic NPIs supports one of the core elements of the Welsh Antimicrobial Resistance Programme: to inform, support and promote the prudent use of antimicrobials.

Information from AWMSG Primary Care Antimicrobial Guidelines:

Condition	Comments	Medicine	Adult dose	Duration of treatment
Acute rhinosinusitis • NICE CKS (2024) • NICE NG79 (2017)	**Avoid antibiotics** as 80% resolve in 14 days without, and they only offer marginal benefit after 7 days. **Use adequate analgesia.** **Bacterial cause may be more likely if several of the following are present:** Symptoms for more than 10 days Discoloured or purulent nasal discharge Severe localised unilateral pain (particularly pain over teeth and jaw) Fever Marked deterioration after an initial milder phase **Symptoms for 10 days or less:** No antibiotic **Symptoms with no improvement for >10 days:** No antibiotic. Consider prescribing a high-dose nasal corticosteroid for 14 days for adults and children aged 12 years and over (off-label use see NICE guidance). (Back-up antibiotic prescription can be issued if appropriate – please see prescribing options below.) Consider back-up prescription (to be used if symptoms don't improve within 7 days or if they worsen rapidly or significantly at any time) or immediate antibiotic when purulent nasal discharge. **Systemically very unwell, symptoms and signs of a more serious illness or condition, or high risk of complications:** Immediate antibiotic Refer to hospital if: • Severe systemic infection • Intraorbital or periorbital complications • Intracranial complication	No antibiotic	When an antibiotic is not prescribed, please consider using the 'TARGET Treating your Infection' leaflet (RCGP), available in multiple languages.	
		First line if symptoms for > 10 days and back-up or immediate antibiotics are indicated		
		Phenoxymethylpenicillin	500 mg QDS	5 days
		Penicillin allergy: Doxycycline (if >12 years old)	200 mg stat then 100 mg OD	5 days
		OR		
		Clarithromycin (children < 12 years old)	500 mg BD (See BNFc)	
		OR		
		Erythromycin (preferred if pregnant)	250–500 mg QDS	
		First line if systemically very unwell, symptoms and signs of a more serious illness or condition, or high risk of complications OR Second line (worsening symptoms on first choice taken for at least 2 to 3 days):		
		Co-amoxiclav	625 mg TDS	5 days

Method

Assess a reasonable sample of records with a diagnosis of acute rhinosinusitis (see section on Sample size). Patients with recurrent or chronic sinus infections should be excluded. Search using the following Read Codes:

H010	Acute maxillary sinusitis
H011	Acute frontal sinusitis
H012	Acute ethmoidal sinusitis
H013	Acute sphenoidal sinusitis
H014	Acute rhinosinusitis
H01y	Other acute sinusitis
H01z	Acute sinusitis

Start the searches using a 3-month window and extend it if necessary to reach the required number of cases.

Following the audit, complete the Review Sheet.

Please note, as and when SNOMED codes are more routinely used across Wales, this document will be updated to include a list of relevant codes.

Data collection sheet

An Excel version of this data collection sheet is available on the AWTTC website.

Patient ID	Symptoms recorded as present for 10 days or more? • Yes [Y] • No [N]	Purulent nasal discharge? • Yes [Y] • No [N]	Systemically very unwell, signs of a more serious illness, or high risk of complications? **OR** worsening symptoms on first line treatment? • Yes [Y] • No [N]	Antibiotic given? • Yes [Y] • No [N]	If an antibiotic given, was there a record of: purulent discharge or symptoms being present for 10 days or more? **OR** systemically unwell? **OR** worsening symptoms on first line treatment? • Yes [Y] • No [N]	Back-up delayed prescribing? • Yes [Y] • No [N]	Decision to prescribe/not to prescribe in line with guidelines OR deviation justified? • Yes [Y] • No [N]	Patient given information leaflet or signposted to information? • Yes [Y] • No [N]	Antibiotic prescribed (record name, dose, frequency and duration)	If antibiotic choice deviates from guidance, record reason (if documented)
Total										
% Yes										
Standard					**100%**		**100%**			

4.3 Antibiotic prescribing for acute otitis media

Background

AWMSG NPI: Antibacterial items per 1,000 STAR-PUs

The development of antibiotic NPIs supports one of the core elements of the Welsh Antimicrobial Resistance Programme: to inform, support and promote the prudent use of antimicrobials.

Information from AWMSG Primary Care Antimicrobial Guidelines:

<table>
<tr><th>Condition</th><th>Comments</th><th colspan="2">Medicine</th><th>Adult dose</th><th>Duration of treatment</th></tr>
<tr><td rowspan="11">Acute otitis media (in children)
• NICE NG91 (2022)</td><td rowspan="11">Otitis media can be caused by viruses and bacteria. It is difficult to distinguish and both are often present at the same time.
Optimise analgesia: Paracetamol or ibuprofen should be used regularly for pain at the right dose (for age or weight) and at the right time; and maximum doses for severe pain. Consider eardrops containing an anaesthetic and an analgesic for pain.
For children and young people who may be less likely to benefit from antibiotics, consider NO antibiotic taking account of:
• Otitis media is mostly self- limiting. Most get better within 3 days without antibiotics, but it can last for up to 1 week.
• Antibiotics make little difference to symptoms.
• Antibiotics make little difference to the rates of common complications like recurrence of infection, hearing loss (which is usually temporary) and perforated eardrum.
• Mastoiditis is rare with or without antibiotics. Antibiotics to prevent mastoiditis NNT > 4000.
For children more likely to benefit from antibiotics (i.e. < 2 years with infection in both ears OR children of any age with otorrhoea), consider no antibiotic prescription, back-up delayed antibiotics, or immediate antibiotics.
For children who are systemically very unwell, have symptoms or signs of a more serious illness, or are at high risk of serious complications because of pre-existing comorbidity, offer immediate antibiotics. Pre-existing comorbidity include:
• Significant heart, lung, renal, liver or neuromuscular disease
• Immunosuppression
• Cystic fibrosis
• Young children who were born prematurely.
Safety netting:
• No antibiotic – Seek medical help if symptoms worsen rapidly or significantly, do not start to improve after 3 days, or child becomes systemically very unwell.
• Back-up delayed antibiotic – Advise to use if symptoms do not start to improve within 3 days, or if they worsen rapidly or significantly at any time. Seek medical help if symptoms worsen rapidly or significantly, or child becomes systemically very unwell.
• Immediate antibiotic – Seek medical help if symptoms worsen rapidly or significantly, or child becomes systemically very unwell.</td><td colspan="4">If NO immediate antibiotic required, for pain relief offer oral analgesia and consider the use of eardrops below:</td></tr>
<tr><td colspan="2">Phenazone 40mg/g with lidocaine 10mg/g
Use only if all apply:
• Immediate oral antibiotic is not given
• No eardrum perforation
• No otorrhoea</td><td>Apply 4 drops two or three times a day</td><td>Up to 7 days</td></tr>
<tr><td colspan="4">Consider using the ‘When Should I Worry?’ booklet or a ‘TARGET Treating your Infection’ leaflet (RCGP), available in multiple languages.</td></tr>
<tr><td colspan="4">If an antibiotic required:</td></tr>
<tr><td rowspan="2">First line</td><td>Amoxicillin</td><td>See BNFc</td><td>5–7 days</td></tr>
<tr><td>Penicillin allergy: Clarithromycin</td><td>See BNFc</td><td>5–7 days</td></tr>
<tr><td rowspan="2">Second line
(If symptoms worsening on first line option taken for at least 2–3 days)</td><td>Co-amoxiclav</td><td>See BNFc</td><td>5–7 days</td></tr>
<tr><td colspan="3">Pencillin allergy:
Consult local microbiologist</td></tr>
</table>

Method

Assess a reasonable sample of records with a diagnosis of acute otitis media (see section on Sample size). Patients with chronic otitis media should be excluded. Search using the following Read Codes:

2D94.00	O/E - tympanic membrane pink	F510011	Acute secretory otitis media
2D95.00	O/E - tympanic membrane red	F510100	Acute serous otitis media
2D96.00	O/E - tympanic membrane bulging	F510200	Acute mucoid otitis media
F51..00	Non-suppurative otitis media + eustachian tube disorders	F510z00	Acute nonsuppurative otitis media NOS
F510.00	Acute non suppurative otitis media	F514.00	Unspecified nonsuppurative otitis media
F510000	Acute otitis media with effusion	F514100	Serous otitis media NOS
F514200	Catarrhal otitis media NOS	F520z00	Acute suppurative otitis media NOS
F514300	Mucoid otitis media NOS	F524.00	Purulent otitis media NOS
F514z00	Nonsuppurative otitis media NOS	F524000	Bilateral suppurative otitis media
F52..00	Suppurative and unspecified otitis media	F526.00	Acute left otitis media
F520.00	Acute suppurative otitis media	F527.00	Acute right otitis media
F520000	Acute suppurative otitis media tympanic membrane intact	F528.00	Acute bilateral otitis media
F520100	Acute suppurative otitis media tympanic membrane ruptured	F52z.00	Otitis media NOS
F520300	Acute suppurative otitis media due to disease elsewhere classified	F52z.11	Infection ear

Start the searches using a 3-month window and extend it if necessary to reach the required number of cases.

Following the audit, complete the Review Sheet.

Please note, as and when SNOMED codes are more routinely used across Wales, this document will be updated to include a list of relevant codes.

Data collection sheet

An Excel version of this data collection sheet is available on the AWTTC website.

Patient ID	< 2 years with infection in both ears? • Yes [Y] • No [N]	Child (of any age) with otorrhoea? • Yes [Y] • No [N]	Systemically very unwell, signs of a more serious illness, or high risk of complications? • Yes [Y] • No [N]	Antibiotic given? • Yes [Y] • No [N]	Back-up delayed prescribing? • Yes [Y] • No [N]	Decision to prescribe/not to prescribe in line with guidelines OR deviation justified? • Yes [Y] • No [N]	Patient given information leaflet or signposted to information? • Yes [Y] • No [N]	Antibiotic prescribed (record name, dose, frequency and duration)	If antibiotic choice deviates from guidance, record reason (if documented)
Total									
% Yes									
Standard						**100%**			

4.4 Antibiotic prescribing for lower urinary tract infections (UTIs) in patients ≥ 65 years

Background

AWMSG NPI: Antibacterial items per 1,000 STAR-PUs

The development of antibiotic NPIs supports one of the core elements of the Welsh Antimicrobial Resistance Programme: to inform, support and promote the prudent use of antimicrobials.

Information from AWMSG Primary Care Antimicrobial Guidelines:

<table>
<tr><th>Condition</th><th>Comments</th><th colspan="2">Medicine</th><th>Adult dose</th><th>Duration of treatment</th></tr>
<tr><td rowspan="5">Lower UTI in patients ≥ 65 years</td><td rowspan="5">Treat according to sensitivities on recent mid-stream sample of urine (MSU) results if available, otherwise treat empirically.

Do not treat asymptomatic bacteriuria except in exceptional circumstances after consultation with a relevant specialist team (e.g. urology, renal transplant teams, etc.); it is common in adults ≥ 65 years but is not associated with increased morbidity.

Do not dipstick in patients ≥ 65 years of age. Diagnosis should be made on assessment of symptoms.

Men: If infection is indicated, consider prostatitis and send pre-treatment mid-stream sample of urine (MSU).

Nitrofurantoin is not recommended for men with suspected prostate involvement because it is unlikely to reach therapeutic levels in the prostate.

NB: Nitrofurantoin, pivmecillinam and fosfomycin are not appropriate for the treatment of upper UTI/pyelonephritis. MHRA Guidance on Nitrofurantoin risks of pulmonary and hepatic adverse drug reactions.

Resistance to many agents is increasing, particularly in the elderly (≥ 65 years). If high risk of resistance, send urine for microscopy, culture and sensitivity (MC&S).

Risk factors for increased resistance include: care home resident; recurrent UTI; hospitalisation > 7 days in the last 6 months; unresolving urinary symptoms; recent travel to areas of high antimicrobial resistance (outside Northern Europe and Australasia), previous resistant UTI.</td><td>First line</td><td>Nitrofurantoin (if estimated glomerular filtration rate [eGFR] ≥ 45 ml/minute)</td><td>100 mg m/r BD</td><td rowspan="3">Uncomplicated - 3 days
Complicated - 7 days</td></tr>
<tr><td rowspan="3">Second line</td><td>Pivmecillinam (Warning: β-lactam, do not use if allergic to penicillin)</td><td>400 mg STAT then 200 mg TDS, higher doses can be used in recurrent infection, see BNF</td></tr>
<tr><td>OR</td><td></td></tr>
<tr><td>Fosfomycin</td><td>3 g sachet</td><td>Women: 3 g PO stat (plus additional 3 g dose 3 days later if complicated UTI)

Men: 3 g PO stat plus 3 g dose 3 days later
(Prescribing in men and complicated UTIs are both off-label)</td></tr>
<tr><td>Third line</td><td>Trimethoprim (only if recent MSU shows sensitivities)</td><td>200 mg BD</td><td>Uncomplicated - 3 days
Complicated - 7 days</td></tr>
<tr><td colspan="4">Complicated infection defined as all males, females with renal impairment, abnormal urinary tract, poorly controlled diabetes or immunosuppression.

Use nitrofurantoin first-line as general resistance and the prevalence of community multi-resistant extended-spectrum beta-lactamase E. coli is increasing. Pivmecillinam and fosfomycin are alternative second line agents. Trimethoprim should only be used third line if recent MSU shows sensitivities

If increased resistance risk, send culture for susceptibility testing & give safety net advice. If eGFR < 45 ml/minute or elderly, consider pivmecillinam or fosfomycin.</td></tr>
</table>

Clinical signs and symptoms of lower UTIs include new onset dysuria alone or two or more signs of infection: Temperature 1.5°C above patient's normal at least twice in 12 hours, new frequency or urgency, new incontinence, new or worsening delirium/debility, new suprapubic pain or visible haematuria. If fever and delirium/debility only, consider other causes before treating for UTI[9].

If symptomatic, send urine for culture and treat with antibiotics as per guidelines.

If asymptomatic: do not send urine for culture.

Method

Assess a reasonable sample of records with a diagnosis of UTI (see section on Sample size). Exclude those under 65 years of age, patients with catheter-associated UTI and patients with acute pyelonephritis. Search using the following Read Codes:

R081	Dysuria
K15	Cystitis
K190	Urinary tract infection
1J4	Suspected UTI

Following the audit, complete the Review Sheet.

Please note, as and when SNOMED codes are more routinely used across Wales, this document will be updated to include a list of relevant codes.

Data collection sheet

An Excel version of this data collection sheet is available on the AWTTC website.

Patient ID	Date of birth (DD/MM/YYYY)	Gender (optional data field)	Was the diagnosis of lower UTI based on clinical signs or symptoms (i.e. new onset dysuria alone or two or more signs of infection?) • Yes [Y] • No [N]	Was a urine dip stick test used to diagnose the lower UTI? • Yes [Y] • No [N]	Was the antibiotic prescribed following local guidance/ following recent sensitivities? • Yes [Y] • No [N]	Antibiotic prescribed (record name, dose and frequency)	Antibiotic course length (number of days)	Has a midstream specimen of urine (MSU) been sent? • Yes [Y] • No [N] • Unable to obtain sample [N/A]
Total								
% Yes								
Standard				**0%**	**100%**			

4.5 Antibiotic prescribing for acute cough/acute bronchitis

Background

AWMSG NPI: Antibacterial items per 1,000 STAR-PUs

The development of antibiotic NPIs supports one of the core elements of the Welsh Antimicrobial Resistance Programme: to inform, support and promote the prudent use of antimicrobials.

Information from AWMSG Primary Care Antimicrobial Guidelines:

<table>
<tr><th>Condition</th><th>Comments</th><th>Medicine</th><th>Adult dose</th><th>Duration of treatment</th></tr>
<tr><td rowspan="3">Acute cough, bronchitis
• NICE CKS (2023)
• NICE NG120 (2022)</td><td rowspan="3">Antibiotics are of little benefit if there is no co-morbidity
• First line: self-care and safety netting advice.
• Second line: Consider a back-up delayed antibiotic prescription with safety netting advice and advise that symptom resolution can take 3 weeks.
Offer immediate antibiotics for people with an acute cough who are identified as systemically very unwell (ideally at a face-to-face clinical examination)
Consider immediate or back-up antibiotics for patients at higher risk of complications (ideally at a face-to-face clinical examination). Higher risk of complications if they:
• have a pre-existing comorbidity, such as significant heart, lung, renal, liver or neuromuscular disease, immunosuppression or cystic fibrosis
• are young children who were born prematurely
• are ≥ 65 years with TWO or more of the following criteria, or ≥ 80 years with ONE or more of the following criteria:
  • hospitalisation in previous year
  • type 1 or type 2 diabetes
  • history of congestive heart failure
  • current use of oral corticosteroids.
If available, consider C-reactive protein (CRP) if antibiotic is being considered:
• No antibiotics if CRP < 20mg/L and symptoms for >24 hours.
• Back-up delayed antibiotics if CRP 20–100 mg/L.
• Immediate antibiotics if CRP > 100mg/L.</td><td>No antibiotic</td><td colspan="2">When an antibiotic is not prescribed, please consider using the ‘TARGET Treating your Infection’ leaflet (RCGP), available in multiple languages.</td></tr>
<tr><td>Amoxicillin</td><td>500 mg TDS</td><td>5 days</td></tr>
<tr><td>Penicillin allergy:
Doxycycline</td><td>200 mg stat then 100 mg OD</td><td>5 days</td></tr>
</table>

Recommendations from NICE Guideline 120 *Cough (acute): antimicrobial prescribing*[10]

Do not offer an antibiotic to treat an acute cough associated with an upper respiratory tract infection in people who are not systemically very unwell or at higher risk of complications. Give advice about why an antibiotic is not needed.

Acute cough associated with acute bronchitis
Do not routinely offer an antibiotic to treat an acute cough associated with acute bronchitis in people who are not systemically very unwell or at higher risk of complications.
Be aware that:

- *antibiotics do not improve the overall clinical condition of people with acute bronchitis*
- *antibiotics make little difference to how long symptoms of acute bronchitis last (on average they shorten cough duration by about half a day)*
- *antibiotics have possible adverse effects, particularly diarrhoea and nausea.*

When no antibiotic prescription is given, give advice about why an antibiotic is not needed.

If an antibiotic prescription is given, give advice about possible adverse effects of the antibiotic, particularly diarrhoea and nausea.

Acute cough in people who are systemically very unwell or at higher risk of complications
For people with an acute cough who are identified as systemically very unwell (ideally at a face-to-face clinical examination), offer an immediate antibiotic prescription.

Be aware that people with an acute cough may be at higher risk of complications if they:

- *have a pre-existing comorbidity, such as significant heart, lung, renal, liver or neuromuscular disease, immunosuppression or cystic fibrosis*
- *are young children who were born prematurely*
- *are older than 65 years with 2 or more of the following criteria, or older than 80 years with 1 or more of the following criteria:*
    - *hospitalisation in previous year*
    - *type 1 or type 2 diabetes*
    - *history of congestive heart failure*
    - *current use of oral corticosteroids.*

For people with an acute cough who are identified as at higher risk of complications (ideally at a face-to-face clinical examination), consider:

- *an immediate antibiotic prescription* ***or***
- *a back-up antibiotic prescription.*

When an immediate antibiotic prescription is given, give advice about possible adverse effects of the antibiotic, particularly diarrhoea and nausea.

When a back-up antibiotic prescription is given, give advice about:

- *an antibiotic not being needed immediately*
- *using the back-up prescription if symptoms worsen rapidly or significantly at any time.*

Back-up delayed prescribing

It has been suggested that asking the patient to return to the practice reception or a nominated pharmacy is more effective than handing the back-up delayed prescription to the patient. An agreement with the pharmacist to return uncollected prescriptions can be informative for the prescriber.

Information for the patient can be issued during a consultation to support no prescribing or back-up delayed prescribing.

Method

Assess a reasonable sample of records both adults and children, with a diagnosis of acute cough/acute bronchitis (see section on Sample size). To identify the sample, perform a search using an appropriate selection of the following Read Codes:

171	Cough
1712	Dry cough
1714	Productive cough- green sputum
1719	Chesty cough
171F	Cough with fever
171z	Cough symptoms
H051	Acute upper respiratory tract infection (RTI)
H05z	Upper respiratory infection NOS
H05z-1	Upper RTI
H05z-2	Viral upper respiratory tract infection
H060	Acute bronchitis
H060-1	Acute wheezy bronchitis
H060z	Acute bronchitis NOS
H062	Acute lower RTI
H06z0	Chest infection NOS
H06z0-1	Chest infection
H06z1	Lower RTI
H06z1-2	Acute lower RTI
h0z	Acute respiratory infection NOS
H30	Bronchitis unspecified
H30-1	Chest infection - unspecified bronchitis
H302	Wheezy bronchitis
H30z	Bronchitis NOS
H5yy-1	Respiratory infection NOS
R062	[D] Cough

Start the searches using a 3-month window and extend it if necessary to reach the required number of cases.

Following the audit, complete the Review Sheet.

Please note, as and when SNOMED codes are more routinely used across Wales, this document will be updated to include a list of relevant codes.

Data collection sheet

An Excel version of this data collection sheet is available on the AWTTC website.

Patient ID	Documented both temperature and chest examination? • Yes [Y] • No [N]	Additional clinical features of severity/systemic upset recorded (pulse, respiratory rate or oximetry)? • 2 or more = Yes [Y] • < 2 = No [N]	Antibiotic prescribed? • No antibiotic offered [Nil] • Immediate prescription [I] • Back-up delayed [BU]	Decision to prescribe/not to prescribe in line with guidelines OR deviation justified? • Yes [Y] • No [N]	If antibiotic supplied, is the antibiotic choice as per guidance? • Yes [Y] • No [N]	Antibiotic prescribed (record name, dose, frequency and duration)
Total			**Nil**	**I**	**BU**			
% Yes								
Standard	**100%**					**100%**	**100%**	

5.0 Quality of prescribing – Primary care

5.1 Fluoroquinolone prescribing

Background

AWMSG NPI: 4C items per 1,000 patients

Information from AWMSG Primary Care Antimicrobial Guidelines:

Condition	Comments	Medicine		Adult dose	Duration of treatment
Acute pyelonephritis (upper UTI) • NICE CKS (2023)	If admission not needed, send MSU for MC&S and start antibiotics. Reassess the person if symptoms worsen at any time, or do not start to improve within 48 hours of taking the antibiotic. **Refer pregnant women with pyelonephritis to secondary care for IV antibiotics.** **Treat according to sensitivities on recent MSU results if available, otherwise treat empirically.**	First line	Cefalexin	1 g TDS	7–10 days
			OR		
			Trimethoprim (if susceptible)	200 mg BD	14 days
			OR		
			Co-amoxiclav (if susceptible)	625 mg TDS	7–10 days
		Second line	Ciprofloxacin (Consider updated (January 2024) prescribing restrictions and safety issues – see MHRA advice. PIL English – Welsh).	500 mg BD	7 days
Acute prostatitis • NICE CKS (2024) • NICE NG110 (2018)	Send MSU for culture and start antibiotics. A 4 week course may prevent chronic prostatitis. **Fluoroquinolone antibiotics must now only be prescribed when other commonly recommended antibiotics are inappropriate.** Consider updated (January 2024) prescribing restrictions and safety issues – see MHRA advice. Fluoroquinolones achieve higher prostate levels. See previous MHRA advice for restrictions and precautions for using fluoroquinolones due to very rare reports of disabling and potentially long-lasting or irreversible side effects affecting musculoskeletal, cardiac and nervous systems. Warnings include stopping treatment at first signs of serious adverse reaction (such as tendonitis), prescribing with special caution in people over 60 years and avoiding co-administration with a corticosteroid (December 2020).	First line	Co-trimoxazole (if no previous history of Trimethoprim resistance)	960 mg BD	14 days, then review
		Second line	Ciprofloxacin (Consider updated (January 2024) prescribing restrictions and safety issues – see MHRA advice. PIL English – Welsh).	500 mg BD	
			OR		
			Ofloxacin (Consider updated (January 2024) prescribing restrictions and safety issues – see MHRA advice. PIL English – Welsh).	200 mg BD	

Condition	Comments	Medicine		Adult dose	Duration of treatment
Non-specific/non-gonococcal urethritis – first episode • BASHH (2018) • NICE CKS (2024)	Patients should abstain from sexual intercourse until 14 days after start of treatment and symptoms have resolved. Treat partners and refer to Sexual Health service.	First line	Doxycycline	100 mg BD	7 days
		Second line	Azithromycin	1 g stat then 500 mg OD for 2 days	3 days
		Third line	Levofloxacin (Consider updated (January 2024) prescribing restrictions and safety issues – see MHRA advice. PIL English – Welsh).	500 mg OD	7 days
Pelvic inflammatory disease • BASHH (2019) • NICE CKS (2019)	Refer patient and contacts to Sexual Health service. Always culture for gonorrhoea and chlamydia and test for Mycoplasma genitalium. 28% of gonorrhoea isolates are now resistant to quinolones, therefore if gonorrhoea likely (partner has it, severe symptoms, sex abroad) use ceftriaxone regimen or refer to Sexual Health service. Use of an oral cephalosporin instead of IM preparations is not recommended due to increasing resistance. **Exclude**: ectopic pregnancy, appendicitis, endometriosis, UTI, irritable bowel, complicated ovarian cyst, functional pain.	First line	Ceftriaxone **PLUS** Metronidazole **PLUS** Doxycycline	1 g IM 400 mg BD 100 mg BD	Stat 14 days 14 days
		Second line	Metronidazole **PLUS** Ofloxacin (Consider updated (January 2024) prescribing restrictions and safety issues – see MHRA advice. PIL English – Welsh).	400 mg BD 100 mg BD	14 days 14 days

Fluoroquinolones may also be required in response to sensitivity results where a preferred agent is not suitable due to resistance.

Method

Assess a reasonable sample of records per prescriber with prescription of a fluoroquinolone (see section on Sample size). Exclude prescriptions given for traveller's diarrhoea or *Helicobacter pylori* eradication.

Identify prescriptions for the following **oral** medicines:

- Ciprofloxacin
- Levofloxacin
- Ofloxacin

Start the searches using a 3-month window and extend it if necessary to reach the required number of cases.

Following the audit, complete the Review Sheet.

Data collection sheet

An Excel version of this data collection sheet is available on the AWTTC website.

Patient ID	Fluoroquinolone prescribed (Name)	Pyelonephritis – second line? • Yes [Y] • No [N]	Pelvic inflammatory disease – second line? • Yes [Y] • No [N]	Acute prostatitis – second line? • Yes [Y] • No [N]	Non-specific/ non-gonococcal urethritis – first episode, third line? • Yes [Y] • No [N]	Laboratory sensitivity? • Yes [Y] • No [N]	Other indication (Please list)	Decision to prescribe is according to national/local guidance or lab sensitivity? • Yes [Y] • No [N]
Total								
% Yes								
Standard								**100%**

5.2 Cephalosporin prescribing

Background
AWMSG NPI: 4C items per 1,000 patients

Information from AWMSG Primary Care Antimicrobial Guidelines:

Condition	Comments	Medicine		Adult dose	Duration of treatment
Acute pyelonephritis (upper UTI) • NICE CKS (2023)	If admission not needed, send MSU for MC&S and start antibiotics. Reassess the person if symptoms worsen at any time, or do not start to improve within 48 hours of taking the antibiotic. **Refer pregnant women with pyelonephritis to secondary care for IV antibiotics.** **Treat according to sensitivities on recent MSU results if available, otherwise treat empirically.**	First line	Cefalexin	1 g TDS	7–10 days
			OR		
			Trimethoprim (if susceptible)	200 mg BD	14 days
			OR		
			Co-amoxiclav (if susceptible)	625 mg TDS	7–10 days
		Second line	Ciprofloxacin (Consider updated (January 2024) prescribing restrictions and safety issues – see MHRA advice. PIL English – Welsh).	500 mg BD	7 days
Acute pyelonephritis in pregnancy • NICE CKS (2021)	Referring or seeking specialist advice for people with acute pyelonephritis if they are pregnant is recommended. If admission not needed, send MSU for culture and sensitivities and start antibiotics. If no response within 24 hours, admit. Advise patient to seek medical help if symptoms worsen at any time or do not start to improve within 48 hours of taking the antibiotic, or become systemically very unwell.	Cefalexin		1 g TDS	7–10 days

Condition	Comments	Medicine		Adult dose	Duration of treatment
Lower UTI in pregnancy • NICE CKS (2021) • BNF (2026)	Send MSU for culture and start antibiotics. Short-term use of nitrofurantoin in pregnancy is unlikely to cause problems to the foetus. Avoid at term and close to or during labour or delivery due to risk of neonatal haemolysis. This includes patients with threatened pre-term labour. **Treatment of asymptomatic bacteriuria in pregnant women**: base choice on recent urine MC&S results. If group B *Streptococcal* bacteriuria is identified ensure antenatal services are made aware as intrapartum antibiotic prophylaxis will be required in addition to treatment at the time of diagnosis. **Pivmecillinam use in pregnancy:** **Pivmecillinam is not recommended as empirical treatment, however, if MC&S results indicate the clinical need for Pivmecillinam treatment, please note the information below:** • Pivmecillinam like other penicillins can be used in pregnancy if clinically indicated. • If pivmecillinam is taken during pregnancy it may cause a false positive newborn screening result for isovaleric acidaemia. • If treatment is required, particularly close to delivery, the potential risk of a false positive newborn screening result should be clearly documented and explained to the patient.	First line	Nitrofurantoin (if eGFR ≥ 45 ml/minute. Avoid at term - may produce neonatal haemolysis) (patient information on use in pregnancy) MHRA Guidance on Nitrofurantoin risks.	100 mg m/r BD	7 days
			OR		
			Amoxicillin (If susceptible MC&S results) (patient information on use in pregnancy)	500 mg TDS	
		Second line	Cefalexin (patient information on use in pregnancy)	500 mg BD	

Condition	Comments	Medicine		Adult dose	Duration of treatment
Catheter-associated UTI • NICE NG113 (2018)	Antibiotics will not eradicate asymptomatic bacteriuria; only treat if systemically unwell or pyelonephritis likely. Do not use prophylactic antibiotics for catheter changes unless history of catheter-change-associated UTI or trauma (NICE [CG139] *Healthcare-associated infections: prevention and control in primary and community care*). Ensure all patients with an indwelling catheter have a catheter passport completed. **If signs and symptoms of pyelonephritis (upper UTI), treat as per pyelonephritis.** Ensure catheter is correctly positioned, drains correctly and is not blocked. Consider removing or changing the catheter if it has been in place for more than 7 days. Do not perform urine dipsticks. Most people with a urinary catheter will have bacteria present in the bladder/urine without an infection. **Treat according to sensitivities on recent (0-6 months) MSU/Catheter Specimen of Urine (CSU) results if available, otherwise treat empirically.** Resistance to many agents is increasing, particularly in the elderly (≥ 65 years old). **NB: Susceptibilities are only released if clinical details that indicate systemic or specific clinical signs of infection are included on the request form. If sensitivities are suppressed and the patient has signs of infection, contact microbiology for discussion.**	Non-pregnant women and men, no upper UTI symptoms, first line:	Nitrofurantoin (if eGFR ≥ 45 ml/minute) MHRA Guidance on Nitrofurantoin risks.	100 mg m/r BD	7 days
			OR		
			Trimethoprim (if susceptible)	200 mg BD	
			OR		
			Amoxicillin (if susceptible)	500 mg TDS	
		Non-pregnant women and men, no upper UTI symptoms, second line:	Pivmecillinam (Warning: β-lactam, do not use if allergic to penicillin).	400 mg TDS (N.B. High dose recommended due to increased risk of resistance)	7 days
		Pregnant women, no upper UTI symptoms (consider hospital referral/seeking specialist advice):	Cefalexin	1 g TDS	7–10 days

Condition	Comments	Medicine		Adult dose	Duration of treatment
Lower UTI in children • PHE – UTI: diagnostic tools for primary care (2021) • NICE CKS (2019) • NICE CG54 (2018)	Send pre-treatment MSU for all children with suspected UTI. Child < 3 months: refer urgently for assessment. Child ≥ 3 months: use positive nitrite to guide antibiotic use. Imaging: only refer if child < 6 months, or recurrent or atypical UTI.	First line	Trimethoprim **OR** Nitrofurantoin (if eGFR ≥ 45 ml/minute) (**Note high cost of liquid formulation** - £452.09 per bottle, at the time of writing. Tablets should not be crushed.) MHRA Guidance on Nitrofurantoin risks	See BNFc	3 days
		Second line	Cefalexin (consider if trimethoprim not appropriate and liquid preparation required) **OR** Amoxicillin (If susceptible MC&S results)		
Upper UTI in children • NICE CG54 (2018)	Refer all cases to a paediatrician for further investigation. Send pre-treatment MSU for all children with suspected UTI. **Child < 3 months:** refer urgently for assessment. **Child ≥ 3 months:** use positive nitrite to guide antibiotic use. Imaging: only refer if child < 6 months, recurrent or atypical UTI.	Co-amoxiclav (if susceptible) **OR** Cefalexin		See BNFc	7–10 days

Condition	Comments	Medicine	Adult dose	Duration of treatment
Acute diverticulitis • NICE NG147 (2019)	People with mild, uncomplicated diverticulitis can be managed at home with paracetamol, clear fluids and antibiotics. For people who are systemically well following clinical assessment consider a no antibiotic prescribing strategy and advise the person to re-present if symptoms persist or worsen.	Cefalexin **PLUS** Metronidazole **OR** Co-amoxiclav (Please note increasing resistance rates. Advise patient to re-present **if symptoms persist or worsen**). **OR** Co-trimoxazole **PLUS** Metronidazole	500 mg TDS (up to 1.5 g TDS for severe infections) 400 mg TDS 625 mg TDS 960 mg BD 400 mg TDS	5 days
Biliary infection (cholecystitis/ cholangitis) • NICE CKS (2021)	Urgent referral to secondary care is recommended for all cases of cholecystitis to assess the need for cholecystectomy. Please note high mortality rate (up to 10%) associated with Acute Cholecystitis. If for any reason, you are unable to comply with this advice recommendation for antibiotic treatment for mild cases is outlined here. Biliary colic with no associated infection does not require antibiotics.	Cefalexin **PLUS** Metronidazole **OR** Co-amoxiclav (Please note increasing resistance rates. Advise patient to re-present **if symptoms persist or worsen**). **OR** Co-trimoxazole **PLUS** Metronidazole	500 mg TDS (up to 1.5 g TDS for severe infections) 400 mg TDS 625 mg TDS 960 mg BD 400 mg TDS	5–7 days

Method

Assess a reasonable sample of records per prescriber with prescription of a cephalosporin against national guidelines (see section on Sample size). Exclude prescriptions for IV cephalosporins. Start the searches using a 3-month window and extend it if necessary to reach the required number of cases.

Following the audit, complete the Review Sheet.

Data collection sheet

An Excel version of this data collection sheet is available on the AWTTC website.

Patient ID	Cephalosporin prescribed (Name)	Acute pyelonephritis? • Yes [Y] • No [N]	Acute pyelonephritis in pregnancy? • Yes [Y] • No [N]	Lower UTI in children – second line? • Yes [Y] • No [N]	Upper UTI in children? • Yes [Y] • No [N]	Lower UTI in pregnancy? • Yes [Y] • No [N]	Catheter-associated UTI (Pregnant women, no upper UTI symptoms)? • Yes [Y] • No [N]	Acute diverticulitis? • Yes [Y] • No [N]	Biliary infection (cholecystitis/ cholangitis)? • Yes [Y] • No [N]	Laboratory sensitivity? • Yes [Y] • No [N]	Other indication (Please list)	Decision to prescribe is according to national/local guidance or lab sensitivity? • Yes [Y] • No [N]
Total												
% Yes												
Standard												**100%**

5.3 Co-amoxiclav prescribing

Background

AWMSG NPI: 4C items per 1,000 patients

Information from AWMSG Primary Care Antimicrobial Guidelines:

Condition	Comments	Medicine		Adult dose	Duration of treatment
Acute otitis media (in children) • NICE NG91 (2022)	Otitis media can be caused by viruses and bacteria. It is difficult to distinguish and both are often present at the same time. **Optimise analgesia: Paracetamol or ibuprofen** should be used regularly for pain at the right dose (for age or weight) and at the right time; and **maximum doses** for severe pain. Consider eardrops containing an anaesthetic and an analgesic for pain. For children and young people who may be less likely to benefit from antibiotics, **consider NO antibiotic** taking account of: • **Otitis media is mostly self- limiting.** Most get better within 3 days without antibiotics, but it can last for up to 1 week. • **Antibiotics make little difference to symptoms**. • **Antibiotics make little difference to the rates of common complications** like recurrence of infection, hearing loss (which is usually temporary) and perforated eardrum. • **Mastoiditis is rare with or without antibiotics.** Antibiotics to prevent mastoiditis NNT > 4000. For children **more** likely to benefit from antibiotics (i.e. **< 2 years with infection in both ears OR children of any age with otorrhoea), consider no antibiotic prescription, back-up delayed antibiotics, or immediate antibiotics.** For children who are **systemically very unwell**, have symptoms or **signs of a more serious illness**, or are at **high risk of serious complications** because of pre-existing comorbidity, **offer immediate antibiotics**. Pre-existing comorbidity include: • Significant heart, lung, renal, liver or neuromuscular disease • Immunosuppression • Cystic fibrosis • Young children who were born prematurely. **Safety netting:** • **No antibiotic –** Seek medical help if symptoms worsen rapidly or significantly, do not start to improve after 3 days, or child becomes systemically very unwell. • **Back-up delayed antibiotic –** Advise to use if symptoms do not start to improve within 3 days, or if they worsen rapidly or significantly at any time. Seek medical help if symptoms worsen rapidly or significantly, or child becomes systemically very unwell. • **Immediate antibiotic –** Seek medical help if symptoms worsen rapidly or significantly, or child becomes systemically very unwell.	**If NO immediate antibiotic required, offer analgesia for pain relief and consider the use of eardrops below:**			
		Phenazone 40mg/g with lidocaine 10mg/g Use only if all apply: • Immediate oral antibiotic is not given • No eardrum perforation • No otorrhoea		Apply 4 drops two or three times a day	Up to 7 days
		Consider using the 'When Should I Worry?' booklet or a 'TARGET Treating your Infection' leaflet (RCGP), available in multiple languages.			
		If an antibiotic required:			
		First line	Amoxicillin	See BNFc	5–7 days
			Penicillin allergy: Clarithromycin	See BNFc	5–7 days
		Second line (If symptoms worsening on first line option taken for at least 2–3 days)	Co-amoxiclav	See BNFc	5–7 days
			Penicillin allergy: Consult local microbiologist		

Condition	Comments	Medicine	Adult dose	Duration of treatment
Acute rhinosinusitis • NICE CKS (2024) • NICE NG79 (2017)	**Avoid antibiotics** as 80% resolve in 14 days without, and they only offer marginal benefit after 7 days. **Use adequate analgesia.** **Symptoms for 10 days or less:** No antibiotic **Symptoms with no improvement for >10 days:** No antibiotic. Consider prescribing a high-dose nasal corticosteroid for 14 days for adults and children aged 12 years and over (off-label use see NICE guidance). (Back-up antibiotic prescription can be issued if appropriate – please see prescribing options here.) Consider back-up prescription (to be used if symptoms don't improve within 7 days or if they worsen rapidly or significantly at any time) or immediate antibiotic when purulent nasal discharge. Tetracyclines should not be given to children under 12 years old as deposition of tetracyclines in growing bone and teeth (by binding to calcium) causes staining and occasionally dental hypoplasia. **Systemically very unwell, symptoms and signs of a more serious illness or condition, or high risk of complications:** Immediate antibiotic Refer to hospital if: • Severe systemic infection • Intraorbital or periorbital complications • Intracranial complication	No antibiotic	When an antibiotic is not prescribed, please consider using the 'TARGET Treating your Infection' leaflet (RCGP), available in multiple languages.	
		First line if symptoms for > 10 days and back-up or immediate antibiotics are indicated		
		Phenoxymethylpenicillin	500 mg QDS	5 days
		Penicillin allergy: Doxycycline (if >12 years old)	 200 mg stat then 100 mg OD	5 days
		OR		
		Clarithromycin (children < 12 years old)	500 mg BD (See BNFc)	
		OR		
		Erythromycin (preferred if pregnant)	250–500 mg QDS	
		First line if systemically very unwell, symptoms and signs of a more serious illness or condition, or high risk of complications OR Second line (worsening symptoms on first choice taken for at least 2 to 3 days):		
		Co-amoxiclav	625 mg TDS	5 days

<table>
<tr><th>Condition</th><th>Comments</th><th>Medicine</th><th>Adult dose</th><th>Duration of treatment</th></tr>
<tr><td rowspan="5">Acute infective exacerbation of COPD
• NICE NG114 (2018)
• GOLD (2020)
• RHIG (2020)</td><td rowspan="5">Assessment
• Send Sputum for culture in cases of recurrent or severe exacerbation
• Consider chest radiograph in cases of severe exacerbation, or the patient is presenting with chest signs or they fail to improve.

Antibiotics are not required for exacerbation without increased sputum purulence

Consider the need for an antibiotic taking into account:
• Severity of symptoms (particularly increased breathlessness; sputum colour changes and increased volume or thickness beyond normal
• Risk of complications
• Previous sputum culture and susceptibility results
• Risk of antimicrobial resistance and current antibiotic prophylaxis (treatment should be with an antibiotic from a different class).
• If CRP testing available (see table below)
<table><tr><td>CRP < 20</td><td>Antibiotics unlikely to be helpful</td></tr><tr><td>CRP 20–40</td><td>Consider antibiotics</td></tr><tr><td>CRP > 40</td><td>Prescribe antibiotics</td></tr></table></td><td>Doxycycline</td><td>200 mg stat/100 mg OD</td><td>5 days total</td></tr>
<tr><td>If doxycycline unsuitable:

Amoxicillin</td><td>500 mg TDS</td><td rowspan="3">5 days</td></tr>
<tr><td>OR</td><td></td></tr>
<tr><td>Clarithromycin</td><td>500 mg BD</td></tr>
<tr><td>If patient exposed to antibiotics in the past 3 months or at higher risk of treatment failure:

Co-trimoxazole</td><td>960 mg BD</td><td rowspan="3">5 days</td></tr>
<tr><td>OR</td><td></td></tr>
<tr><td>Co-amoxiclav</td><td>625mg TDS</td></tr>
<tr><td>Upper UTI in children
• NICE CG54 (2018)</td><td>Refer all cases to a paediatrician for further investigation.

Send pre-treatment MSU for all children with suspected UTI.

Child < 3 months: refer urgently for assessment.

Child ≥ 3 months: use positive nitrite to guide antibiotic use.

Imaging: only refer if child < 6 months, recurrent or atypical UTI.</td><td>Co-amoxiclav
(if susceptible)

OR

Cefalexin</td><td>See BNFc</td><td>7–10 days</td></tr>
</table>

Condition	Comments	Medicine		Adult dose	Duration of treatment
Acute pyelonephritis (upper UTI) • NICE CKS (2023)	If admission not needed, send MSU for MC&S and start antibiotics. Reassess the person if symptoms worsen at any time, or do not start to improve within 48 hours of taking the antibiotic. **Refer pregnant women with pyelonephritis to secondary care for IV antibiotics.** **Treat according to sensitivities on recent MSU results if available, otherwise treat empirically.**	First line	Cefalexin	1 g TDS	7–10 days
			OR		
			Trimethoprim (if susceptible)	200 mg BD	14 days
			OR		
			Co-amoxiclav (if susceptible)	625 mg TDS	7–10 days
		Second line	Ciprofloxacin (Consider updated (January 2024) prescribing restrictions and safety issues – see MHRA advice. PIL English – Welsh).	500 mg BD	7 days
Cellulitis & Erysipelas • NICE CKS (2024) • NICE NG141 (2019)	• If patient afebrile and healthy other than cellulitis, use oral flucloxacillin alone. • **If exposed to bodies of water e.g. river, lake, sea, discuss with Consultant Microbiologist.** • If febrile and ill, admit for IV treatment. • **Erysipelas**: often facial and unilateral. Use flucloxacillin for non-facial erysipelas. • Infection around the eyes or the nose (the triangle from the bridge of the nose to the corners of the mouth, or immediately around the eyes including periorbital cellulitis) is of more concern because of risk of a serious intracranial complication For active **MRSA infection**: use antibiotic sensitivities to guide treatment; if severe infection or no response to monotherapy after 24–48 hours, seek advice from Consultant Microbiologist on combination therapy	Flucloxacillin		500 mg–1 g QDS Use higher doses in obesity (Body Mass Index > 30kg/m^2) or depending on severity.	5-7 days If slow response, continue for a further 7 days
		Penicillin allergy:			
		Clarithromycin		500 mg BD	
		OR			
		Doxycycline		200 mg stat, then 100 mg OD	
		OR			
		Erythromycin (if pregnant)		500 mg QDS	
		MRSA known or suspected (check recent cultures and adapt therapy as needed):			5-7 days If slow response, continue for a further 7 days
		Doxycycline		200 mg stat, then 100 mg BD	
		OR			
		Co-trimoxazole		960 mg BD	
		Facial (inside the triangle treat as below – if outside of the triangle treat as above):			7 days
		Co-amoxiclav		625 mg TDS	
		OR (if penicillin allergic)			
		Clarithromycin		500 mg BD	
		PLUS			
		Metronidazole		400 mg TDS	

<table>
<tr><th>Condition</th><th>Comments</th><th>Medicine</th><th>Adult dose</th><th>Duration of treatment</th></tr>
<tr><td>Bites (human/cat/dog)
• NICE CKS (2020)
• NICE NG184 (2020)</td><td colspan="4">
<table>
<tr><th>Type of bite</th><th>Bite has not broken the skin</th><th>Bite has broken the skin but not drawn blood</th><th>Bite has broken the skin and drawn blood</th></tr>
<tr><td>Human bite</td><td>Do not offer antibiotics.</td><td>Consider antibiotics if it is in a high-risk area* or if the person is high risk**.</td><td>Offer antibiotics.</td></tr>
<tr><td>Cat bite</td><td>Do not offer antibiotics.</td><td>Consider antibiotics if the wound could be deep.</td><td>Offer antibiotics.</td></tr>
<tr><td>Dog or other traditional pet bites</td><td>Do not offer antibiotics.</td><td>Do not offer antibiotics.</td><td>Offer antibiotics if it has caused considerable, deep tissue damage or is visibly contaminated. Consider antibiotics if it is in a high-risk area* or person at high risk**.</td></tr>
<tr><td colspan="4">* High-risk area = hands, feet, face, genitals, skin overlying cartilaginous structures or an area of poor circulation.
** High-risk Person = those at risk of serious wound infection (e.g immunosuppression, asplenia, decompensated liver disease, diabetes).</td></tr>
</table>
Increased risk of wound becoming infected due to:
• Nature of the bite (deep, contaminated wounds; puncture or crush wounds; significant tissue destruction)
• Site of injury (e.g. hands, feet, face or genitals; areas of poor perfusion or lymphatic return; or near a prosthetic joint or implant)
• Wound penetrating bone, joints, tendons, or vascular structures
• Delayed presentation (> 8 hours)
• Associated medical conditions (e.g. diabetes mellitus, asplenia, immunocompromised status, chronic liver disease, prosthetic heart valve or joint)
• Patient age (neonates, infants and elderly patients are at higher risk of infection).

Do not offer antibiotic prophylaxis to people with a human/cat/dog bite that has not broken the skin.
• Human:
– Thorough irrigation is important.
– Assess risk of tetanus, HIV and Hepatitis B and C.
• Cat / Dog:
– Thorough irrigation is important.
– Assess risk of tetanus and rabies.
– Antibiotic prophylaxis is advised in the following circumstances: all cat bites; dog bite to hand / foot / face / joint / tendon / ligament; puncture wound; suspected fracture; wounds requiring surgical debridement; wounds that have undergone primary closure; immunocompromised / diabetic / asplenic / cirrhotic / prosthetic heart valve / prosthetic joint / patient at risk of serious wound infection.
• Bat: Urgent treatment required. All patients should be referred to A&E and Public Health Wales Health protection team or the duty virologist (University Hospital of Wales) contacted. Please see PHE guidance (for advice on Rabies) and refer to patients to PHE patient information leaflet.

<u>When to offer antibiotics:</u>
Offer an antibiotic (see the recommendations on choice of antibiotic) for people with a human or animal bite if there are symptoms or signs of infection, such as increased pain, inflammation, fever, discharge or an unpleasant smell.</td><td>Prophylaxis or treatment:
Co-amoxiclav

Penicillin allergy
Metronidazole

PLUS
Doxycycline (cat / dog / human) (N.B. Not suitable for children < 12 years)

If child < 12 years
Co-trimoxazole</td><td>625 mg TDS

400 mg TDS

200 mg stat followed by 100 mg OD–BD

See BNFc</td><td>3 days (prophylaxis)

5 days (treatment)

Course length can be increased to 7 days (with review) based on clinical assessment of the wound, for example, if there is significant tissue destruction or it has penetrated bone, joint, tendon or vascular structures.</td></tr>
</table>

Condition	Comments	Medicine	Adult dose	Duration of treatment
Acute diverticulitis • NICE NG147 (2019)	People with mild, uncomplicated diverticulitis can be managed at home with paracetamol, clear fluids and antibiotics. For people who are systemically well following clinical assessment consider a 'no antibiotic' prescribing strategy and advise the person to re-present if symptoms persist or worsen.	Cefalexin **PLUS** Metronidazole	500 mg TDS (up to 1.5 g TDS for severe infections) 400 mg TDS	5 days
		OR		
		Co-amoxiclav (Please note increasing resistance rates. Advise patient to re-present **if symptoms persist or worsen**).	625 mg TDS	
		OR		
		Co-trimoxazole **PLUS** Metronidazole	960 mg BD 400 mg TDS	
Biliary infection (cholecystitis/ cholangitis) • NICE CKS (2021)	Urgent referral to secondary care is recommended for all cases of cholecystitis to assess the need for cholecystectomy. Please note high mortality rate (up to 10%) associated with acute cholecystitis. If you are unable to comply with this advice for any reason, a recommendation for antibiotic treatment for mild cases is outlined alongside. Biliary colic with no associated infection does not require antibiotics.	Cefalexin **PLUS** Metronidazole	500 mg TDS (up to 1.5 g TDS for severe infections) 400 mg TDS	5–7 days
		OR		
		Co-amoxiclav (Please note increasing resistance rates. Advise patient to re-present **if symptoms persist or worsen**).	625 mg TDS	
		OR		
		Co-trimoxazole **PLUS** Metronidazole	960 mg BD 400 mg TDS	
Epididymo-orchitis • BASHH (2020) • NICE CKS (2024)	Usually due to Gram-negative enteric bacteria in men over 35 years with low risk of STI. If under 35 years old or STI risk, refer to GUM for additional intramuscular (IM) ceftriaxone treatment. Use of an oral cephalosporin instead of IM preparations is not recommended due to increasing resistance.	**If over 35 years with low risk STI:** Co-trimoxazole	960 mg BD	10 days
		OR		
		Co-amoxiclav	625 mg TDS	

Condition	Comments	Medicine	Adult dose	Duration of treatment
Non-lactational mastitis • NICE CKS (2021)	• Refer to NICE CKS for self-care advice to manage pain and discomfort. • *Staphylococcus aureus* is the most common infecting pathogen. • Suspect if woman has a painful breast, fever/general malaise, a tender/red breast. • **Breastfeeding**: oral antibiotics are appropriate where indicated; women should continue feeding, including from the affected breast. In lactational mastitis - prescribe an oral antibiotic if the woman has a nipple fissure that is infected, symptoms have not improved (or are worsening) after 12–24 hours despite effective milk removal.	Co-amoxiclav	625mg TDS	10–14 days

Method

Assess a reasonable sample of records per prescriber with prescription of co-amoxiclav against national guidelines (see section on Sample size). Start the searches using a 3-month window and extend it if necessary to reach the required number of cases.

Following the audit, complete the Review Sheet.

Data collection sheet

An Excel version of this data collection sheet is available on the AWTTC website.

Patient ID	Acute otitis media in children – If an antibiotic is required and symptoms worsening on first line treatment? • Yes [Y] • No [N]	Systemically very unwell with rhinosinusitis, signs of a more serious illness, or high risk of complications? **OR** worsening symptoms of rhinosinusitis on first line treatment? • Yes [Y] • No [N]	COPD with resistance factors? • Yes [Y] • No [N]	Upper UTI in children / Acute pyelonephritis? • Yes [Y] • No [N]	Human/ cat/dog bite? • Yes [Y] • No [N]	Facial cellulitis? • Yes [Y] • No [N]	Acute diverticulitis? • Yes [Y] • No [N]	Biliary infection (cholecystitis/ cholangitis)? • Yes [Y] • No [N]	Epididymo-orchitis? • Yes [Y] • No [N]	Non-lactational mastitis? • Yes [Y] • No [N]	Laboratory sensitivity? • Yes [Y] • No [N]	Other indication (Please list)	Decision to prescribe is according to national/local guidance or lab sensitivity? • Yes [Y] • No [N]
Total													
% Yes													
Standard													**100%**

5.4 Clindamycin prescribing

Background
AWMSG NPI: 4C items per 1,000 patients

Information from AWMSG Primary Care Antimicrobial Guidelines:

Condition	Comments	Medicine	Adult dose	Duration of treatment
Bacterial vaginosis • BASHH (2012) • NICE CKS (2018)	• Oral metronidazole is as effective as topical treatment and is cheaper. • Less relapse with 7 days' treatment than 2 g stat at 4 weeks. • Treating partners does not reduce relapse.	Oral metronidazole	400 mg BD *or* 2 g	7 days stat
		OR		
		Metronidazole 0.75% vaginal gel	5 g applicatorful at night	5 nights
		OR		
		Clindamycin 2% cream	5 g applicatorful at night	7 nights
		Pregnant or breastfeeding: Oral metronidazole	 400 mg BD	 7 days
		OR		
		Metronidazole 0.75% vaginal gel	5 g applicatorful at night	5 nights
		OR		
		Clindamycin 2% cream	5 g applicatorful at night	7 nights

Condition	Comments	Medicine	Adult dose	Duration of treatment
Acne vulgaris • NICE NG198 (2021) • NICE CKS (2021)	Minocycline is not recommended. Do not use the following to treat acne: • monotherapy with a topical antibiotic • monotherapy with an oral antibiotic • a combination of a topical antibiotic and an oral antibiotic. Some people may not require treatment with topical or oral antibiotics, please refer to NICE guidelines for all treatment recommendations. When choosing a first line treatment option take into account the severity of the acne, the person's preferences, and discuss the advantages and disadvantages of the various treatment options. When discussing treatment choices with a person with childbearing potential, cover that topical retinoids and oral tetracyclines are contraindicated during pregnancy and when planning a pregnancy and that they will need to use effective contraception, or choose an alternative treatment to these options. Discuss the importance of completing the course of treatment as positive effects can take 6 to 8 weeks to become noticeable. Consider referring people to a consultant dermatologist-led team if their acne of any severity, or acne-related scarring, is causing or contributing to persistent psychological distress or a mental health disorder. If a person receiving treatment for acne wishes to use hormonal contraception, consider using the combined oral contraceptive pill in preference to the progestogen-only pill. For people with polycystic ovary syndrome and acne; treat their acne using one of the treatment options listed here. If the chosen first-line treatment is not effective, consider adding ethinylestradiol with cyproterone acetate (co-cyprindiol) or an alternative combined oral contraceptive pill to their treatment. Only continue a treatment option that includes an antibiotic (topical or oral) for more than 6 months in exceptional circumstances. Review at 3-monthly intervals, and stop the antibiotic as soon as possible. Topical or oral antibiotics are not recommended for maintenance treatment. Oral antibiotics only recommended for moderate to severe acne.	**Any acne severity:** Fixed combination of topical tretinoin (0.025%) with topical clindamycin (1%)	Apply once daily in the evening	12 weeks then review. If acne fails to respond adequately consider alternative topical treatment choice.
		Mild to moderate acne: Fixed combination of topical benzoyl peroxide (3% or 5%) with topical clindamycin (1%)	Apply once daily in the evening	12 weeks then review. If acne fails to respond adequately consider alternative topical treatment choice. If acne fails to respond adequately to 2 different 12 week courses of treatment options, consider referral to dermatology.
		Moderate to severe acne: Fixed combination of topical adapalene (0.1% or 0.3%) with topical benzoyl peroxide (2.5%)	Apply once daily in the evening	12 weeks then review. If the acne has completely cleared, consider stopping the antibiotic but continuing the topical treatment. If their acne has improved but not completely cleared, consider continuing the oral antibiotic, alongside the topical treatment, for up to 12 more weeks. If acne fails to respond adequately consider referral to dermatology.
		OR		
		Azelaic acid (15% or 20%)	Apply twice daily	
		PLUS		
		Doxycycline	100 mg OD	
		OR		
		Lymecycline	408 mg OD	
		OR		
		Erythromycin (If tetracycline contraindication)	500 mg BD	

Illness	Comments	Medicine	Adult dose	Duration of treatment
Cellulitis in patients with lymphoedema • Lymphoedema Wales (2022) – Note: currently only accessible to staff within NHS Wales	All patients with lymphoedema / chronic oedema and cellulitis should be referred to the Lymphoedema Service. Please refer to *Cellulitis Pathway for People with Lymphoedema or Chronic Oedema in NHS* (Note: this is currently only available for staff within NHS Wales) for further information. Be aware that skin can take some time to return to what is normal for the patient. Consider steroid emollient if there are signs of inflammation after antimicrobial treatment. Consider cellulitis prophylaxis in patients with > 2 episodes of cellulitis in the past 12 months affecting limbs only.	Flucloxacillin	500 mg – 1g QDS	7–14 days
		Penicillin allergy: Clarithromycin	500 mg BD	
		No improvement in cellulitis after initial course of antibiotics: Clindamycin	300–450 mg QDS	
Dental abscess • Scottish Dental Clinical Effectiveness Programme (2025)	• **All patients with dental abscess should be referred to a dentist.** • 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. Repeated antibiotics alone, without drainage, are ineffective in preventing spread of infection. • Antibiotics are required only in cases of cellulitis, spreading infection or systemic involvement. • Transfer patients with significant trismus, floor-of-mouth swelling or difficulty breathing to hospital immediately as an emergency. • The empirical use of cephalosporins, 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. Clarithromycin and clindamycin may be indicated for patients with certain allergies. • If pus is present, this should be drained by a dentist by incision, tooth extraction or via root canal and a sample sent to microbiology. • **If spreading infection (lymph node involvement, or systemic signs i.e. fever or malaise): ADD metronidazole.**	**First line:** Phenoxymethylpenicillin	500 mg QDS	5 days
		Second line (if compliance issue): Amoxicillin	500 mg TDS	
		Penicillin allergy: Metronidazole	400 mg TDS	
		Severe or spreading infection – First line: Phenoxymethylpenicillin	1 g QDS	
		AND		
		Metronidazole	400 mg TDS	
		Severe or spreading infection – First line (if compliance issue): Amoxicillin	1 g TDS	
		AND		
		Metronidazole	400 mg TDS	
		Severe or spreading infection –Penicillin allergy: Clarithromycin	500 mg BD	
		AND		
		Metronidazole	400 mg TDS	
		OR (if allergy to metronidazole)		
		Clindamycin monotherapy	300 mg QDS	

Clindamycin may also be required in response to sensitivity results where a preferred agent is not suitable due to resistance.

Method
Assess a reasonable sample of records per prescriber with prescription of clindamycin against national guidelines (see section on Sample size). Start the searches using a 3-month window and extend it if necessary to reach the required number of cases.

Following the audit, complete the Review Sheet.

Data collection sheet
An Excel version of this data collection sheet is available on the AWTTC website.

Patient ID	Bacterial vaginosis? • Yes [Y] • No [N]	Acne vulgaris? • Yes [Y] • No [N]	Cellulitis in patients with lymphoedema, failure of treatment? • Yes [Y] • No [N]	Severe or spreading infection dental abscess with penicillin and metronidazole allergy? • Yes [Y] • No [N]	Laboratory sensitivity? • Yes [Y] • No [N]	Other indication (Please list)	Decision to prescribe is according to national/local guidance or lab sensitivity?? • Yes [Y] • No [N]
Total							
% Yes							
Standard							**100%**

6.0 Review of patients on long-term antibiotics

Background
AWMSG NPI: Antibacterial items per 1,000 STAR-PUs

The development of antibiotic NPIs supports one of the core elements of the Welsh Antimicrobial Resistance Programme: to inform, support and promote the prudent use of antimicrobials.

As this review may result in the need to amend the medication of individual patients, if the audit is undertaken by an external auditor, agreement to undertake the review must be obtained from the practice before commencing. Any changes to a patient's medication must be agreed by the practice prior to implementing the changes.

This audit is based on the 'Review of patients on long-term antibiotics' audit originally developed in Hywel Dda University Health Board.

Aims

- To promote the safe and appropriate prescribing of long-term antibiotics for patients in primary care.
- To aid the appropriate prescribing of long-term antibiotics for patients, encouraging practices to examine their prescribing in line with the current evidence base and current guidelines.
- To reduce the risk of patients developing *C.difficile* infection.
- To reduce the risk of patients acquiring antibiotic resistant organisms.
- To ensure that patients initiated on long-term antibiotic are reviewed at 6 months to discourage inappropriate prescribing, and to minimise long-term repeat prescriptions.
- To identify prescribing practice for individual patients, and change where appropriate.

Method

- A patient search should be designed and run to identify patients with antibiotics on repeat in the last 6 months.
- The search should include:
    - patients over 18 years of age with repeat issue antibiotics in the last 6 months.
- Patients identified using the search, except those included in the exclusion criteria, should have a data from completed.
- A review should be carried out twelve months from the date of the last audit.

Exclusion/Referral Criteria
The patient's medical history must be reviewed in order to exclude:

- Patients under 18 years
- Patients who have had a splenectomy
- Patients on azithromycin prophylaxis for respiratory tract infection
- Patients on rifaximin for prevention of hepatic encephalopathy

- Patients on demeclocycline for syndrome of inappropriate antidiuretic hormone secretion (SIADH)
- Haematology/Oncology patients on prophylaxis under specialist advice
- Patients on antibiotic prophylaxis for recurrent cellulitis in lymphoedema
- Patients on long-term treatment with antibiotics that are currently under the care and review of a specialist
- Patients who have not received a repeat prescription within the last 6 months, to eliminate one-off repeat prescriptions from previous history.

Good practice points

- Refer to local antibiotic guidelines where appropriate.
- All long-term antibiotics should be followed up at 6-monthly intervals to confirm effectiveness, or sooner if clinically indicated.
- **Check culture results for any recent resistance to inform the choice of antibiotic.** For patients with previous multi-drug resistant (MDR) organisms, seek advice from Microbiology.
- Regular antibiotics may have adverse effects.
- Any medically significant adverse drug reactions to long-term antibiotics should be reported via the Yellow Card Scheme. Information on how to submit a Yellow Card can be found online at yellowcard.mhra.gov.uk/.

Data collection sheet

Name:						
Date of birth:						
Antibiotic prescribed (including dose, quantity & frequency):						
Date initiated:						
Indication:						
Has the indication been coded in the clinical system?			**Yes:**		**No:**	
Initiated by:	**Primary care:**		**Secondary care:**		**Other (please specify)**	
Has there been adequate regular monitoring for the chosen antibiotic? (See AWMSG Primary Care Antimicrobial Guidelines for guidance on recurrent UTI, and refer to summary of product characteristics/BNF)			**Yes:**		**No:**	
Has the patient been counselled on the risk of long-term antibiotic treatment?			**Yes:**		**No:**	
Has there been a review in the last 6 months?			**Yes:**		**No:**	
Is the chosen antibiotic appropriate according to renal or hepatic function?			**Yes:**		**No:**	

Comments (tick as appropriate)		
	Continue if clear indication for treatment and ensure there is appropriate monitoring and review of therapy at 6 months.	
	If no clear indication and started in primary care, review antibiotic use now; consider other options such as stand by antibiotics. Contact microbiology for advice if required.	
		Discontinue
		Stand-by antibiotic
		Change of antibiotic
	Refer back or contact secondary care/initiating prescriber for advice.	
	Other (please provide details):	

GP comment (rationale for decision):

Audit Summary Sheet

An Excel version of this data collection sheet is available on the AWTTC website.

	Number	Percentage of practice population
Practice list size.		**100%**
Number of patients on long-term antibiotic.		

		Number	Percentage of the audit sample	Suggested audit standard
Sample size (i.e. number of patients on long term antibiotic included in the audit).			100%	
Number of patients (by age)	18–40 years			
	41–60 years			
	61–80 years			
	81–100 years			
	100+ years			
Number of prescriptions initiated in primary care.				
Number of patients with adequate regular monitoring for the chosen antibiotic.				**100%**
Number of patients counselled on the risk of long-term antibiotic treatment.				**100%**
Number of patients with a documented review in the last 6 months.				**100%**
Number of patients where the dose is appropriate according to renal/hepatic function.				**100%**

7.0 Feedback forms

7.1 Review sheet

This review sheet is to be completed and included alongside any relevant data collection sheets.

1. How do the results of the data collection compare with the standards set?

2. What discussion/activities were undertaken as a result of the audit?

3. Provide a summary of the discussion and of the changes it has been agreed to implement as a result of this audit.

Audit cycle
Prescribers are reminded that a second data collection in comparison with the standards set will support the identification of quality improvement. (See next page for document to support revalidation for your own records.)

Is a second data collection of selected criteria planned? If so, which criteria have been selected?

This audit was completed by:

Name(s):

Signature(s):

Location (name and address):

Please forward the response sheet to awttc@wales.nhs.uk if you would like to share your findings with the All Wales Therapeutics and Toxicology Centre. Responses will be treated anonymously and used to enable the identification of key learning points, and inform the ongoing development of the audit pack.

Glossary

AWMSG:	All Wales Medicines Strategy Group
BASHH:	British Association for Sexual Health and HIV
BD:	Twice-daily;
BNF:	British National Formulary
BNFc:	British National Formulary for children
CCG:	Clinical Commissioning Group
CEPP:	Clinical Effectiveness Prescribing Programme
CKS:	Clinical Knowledge Summary
COPD:	Chronic obstructive pulmonary disease
CRP:	C-reactive protein
ECDC:	European Centre for Disease Prevention and Control
ESCMID:	European Society for Clinical Microbiology and Infectious Diseases
eGFR:	Estimated glomerular filtration rate
GMC:	General Medical Council
GOLD:	Global Initiative for Chronic Obstructive Lung Disease
GUM:	Genitourinary medicine
HCAI:	Healthcare-acquired infection
IM:	Intra-muscular
IV:	Intra-venous
MC&S:	Microscopy, culture and sensitivity
MHRA:	Medicines and Healthcare products Regulatory Agency
M/R:	Modified-release
MRSA:	Methicillin-resistant *Staphylococcus aureus*
MSU:	Mid-stream sample of urine
NICE:	National Institute for Health and Care Excellence
NNT:	Number needed to treat
NPI:	National Prescribing Indicator
OD:	Once-daily
PHE:	Public Health England
PO:	By mouth (per os)
QDS:	Four times a day
RCGP:	Royal College of General Practitioners
RHIG:	Respiratory Health Implementation Group
SIGN:	Scottish Intercollegiate Guidelines Network
SPIRA:	Server for Prescribing Information Reporting and Analysis
STAR-PU:	Specific therapeutic group age–sex related prescribing units
TARGET:	Treat Antibiotics Responsibly, Guidance, Education and Tools
TDS:	Three times a day
UTI:	Urinary tract infection

References

1. All Wales Medicines Strategy Group. National Prescribing Indicators 2021-2022. 2020. Available at: https://awmsg.nhs.wales/medicines-appraisals-and-guidance/medicines-optimisation/national-prescribing-indicators/national-prescribing-indicators-2021-2022/. Accessed September 2021.
2. All Wales Medicines Strategy Group. *[In development - Primary care antimicrobial guidelines]*. 2021.
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Updates

Date of update publication	Details of update
April 2023	Updated 'Antibiotic prescribing for acute rhinosinusitis' and 'Co-amoxiclav prescribing' audit sections to align with updates made to the 'Primary care antimicrobial guidelines' document.
August 2024	Acute cough, bronchitis updated to align with NICE guidance. Acute sore throat updated to align with NICE guidance.
April 2025	Acute rhinosinusitis section updated to align with NICE guidance.
November 2026	Updates made throughout to reflect the MHRA warning on quinolone use (January 2024) and the changes to prescribing recommendations that were published in March 2024 – including monographs for: • Acute pyelonephritis (upper UTI) • Acute prostatitis • Non-specific / Non-gonococcal urethritis – first episode • Epididymo-orchitis ○ Removed from section 5.1 • Pelvic inflammatory disease. Other minor changes made to align with the current version of the AWMSG-endorsed 'Primary care antimicrobial guidelines' include the following monographs included in this document: • Lower UTI in adults • Lower UTI in pregnancy • Lower UTI in children • Catheter-associated UTI • Cellulitis and erysipelas • Biliary infection (cholecystitis/cholangitis) • Dental abscess.