



## module 248

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Welcome to the two hundred and forty eighth module in the *Pharmacy Magazine* Continuing Professional Development Programme, which looks at **antimicrobial stewardship**.

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## for this module

### GOAL

To consider the role of the community pharmacy team in tackling antimicrobial resistance.

### OBJECTIVES:

- After completing this module you should be able to:
- Explain why antimicrobial resistance is a threat to patient safety, public and global health
  - List common self-limiting infections and their usual duration
  - Outline key messages community pharmacy teams should be sharing with the public.

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## Antimicrobial stewardship

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### Introduction

Antimicrobial resistance (AMR) is defined as the resistance of a microorganism to an antimicrobial medicine to which it was originally sensitive. Organisms that are able to withstand attack by antimicrobial medicines (e.g. antibiotics, antifungals, antivirals and antimalarials) include bacteria, fungi, viruses and some parasites. This can lead to standard treatments becoming ineffective and infections persisting, increasing the risk of spread to others.

The World Health Organization (WHO) recently highlighted the high proportion of antibiotic resistance in bacteria that cause



common infections such as urinary tract, pneumonia and in the bloodstream. In many regions of the world highly resistant bacteria such as methicillin-resistant *Staphylococcus aureus* (MRSA) or multidrug-resistant Gram-negative bacteria cause a high percentage of hospital-acquired infections.

### Worse clinical outcomes

Patients who have infections caused by drug-resistant bacteria generally have increased risk of worse clinical outcomes than those with bacteria that are not resistant.

Antibiotics have significantly reduced deaths from common infections. For example, less than one in 100 young and otherwise healthy people now die from community-acquired pneumonia and skin infections in comparison to the 10 in 100 people who died before antibiotic use.

If antibiotics are lost, society risks returning to the days when those infections now regarded as trivial become fatal again. An infected cut could be life-threatening and an illness like pneumonia would again become a mass killer.

According to a paper published in December 2014 as part of the UK's Review on Antimicrobial Resistance, if drug resistant infections are not tackled now, they could kill an extra 10 million people across the world each year by 2050.

Governments and pharmaceutical companies are considering ways to increase the discovery of new antibiotics. Last month saw the body publish 'Tackling drug-resistant infections globally: final report and recommendations', which outlines ways in which antimicrobial resistance can be tackled. In the meantime the focus is on ensuring the antibiotics currently in existence remain effective, since no new class of antibiotics has been discovered in the past 30 years.

Even if new classes are found, simply replacing old antibiotics with new ones is not the solution as they could also become ineffective if they are not used judiciously.

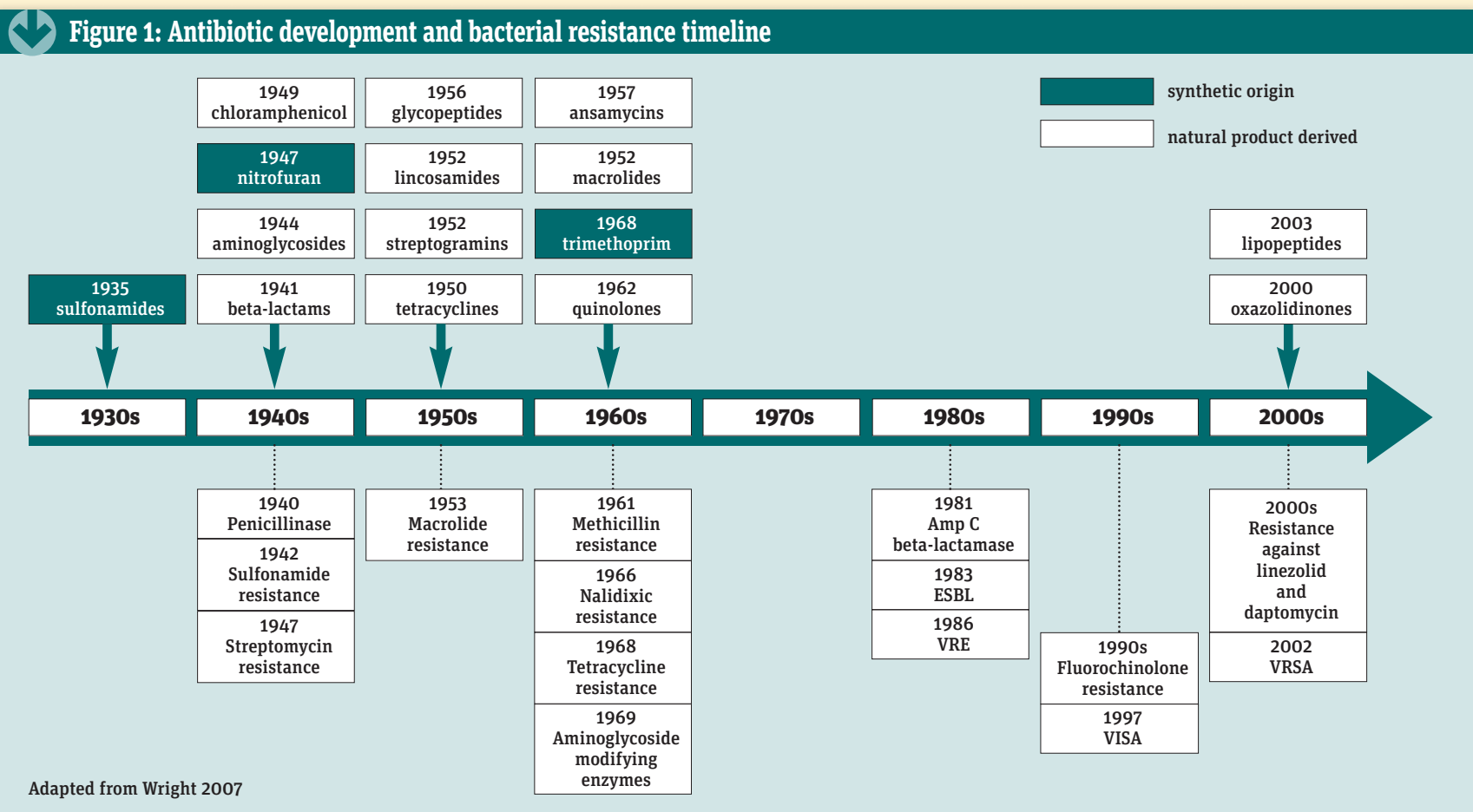
Sir Alexander Fleming, who discovered penicillin, warned of the risk of resistance developing as far back as 1945. During his Nobel Prize speech that year, he said: "The microbes are educated to resist penicillin and a host of penicillin-fast organisms is bred out, which can be passed onto other individuals and

perhaps from there to someone else and to others until they reach someone with a pneumonia which penicillin cannot save. I hope this evil can be averted."

Antimicrobial resistance may be perceived as a problem for the future but it is already having an effect. An estimated 25,000 people die every year in Europe because of infections caused by microorganisms resistant to antimicrobials, while, in the US, the yearly figure is 23,000. According to WHO, there were 480,000 new cases of multidrug-resistant tuberculosis (MDR-TB) reported in 100 countries in 2013. Treatment courses for MDR-TB are much longer and less effective than those for non-resistant TB.

### Medical procedure risks

Without effective antibiotics, procedures designed to help people and ease suffering could actually lead to many more deaths. Cancer chemotherapy, transplants and surgery all rely on the availability of effective antibiotics.



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• Chemotherapy destroys the body's white blood cells, which are required to tackle infection should it occur. Without antibiotics chemotherapy will become increasingly dangerous

• Transplant surgery could also lead to infection since transplant patients receive drugs that intentionally suppress the immune system to ensure the body doesn't reject the new organ. This makes them more prone to bacterial infections that require treatment with antibiotics

• Complex surgery, such as bypass operations or joint replacements, also has increased risk of infection.

It is also clear that medicine has moved on from an era of penicillin being effective for gonorrhoea to having gonorrhoea strains that are resistant to 'last line' antibiotics for the infection. According to WHO, such treatment failure has occurred in 10 countries.

Antibiotic resistance poses a real threat to every individual, with a recent meta-analysis highlighting that the risk of resistance persists for at least 12 months in individuals after each intake of an antibiotic (see Figure 2).

### How AMR is being tackled

Various governments across the world have published strategy documents to combat antimicrobial resistance. In 2015, the WHO developed a draft global action plan following a World Health Assembly resolution.

The plan reflects global agreement on the profound threat antimicrobial resistance poses to human health and seeks to preserve and maintain the responsible and accessible use of antimicrobials for all. The main strategic objectives focus on:

- Improving the understanding and awareness of antimicrobial resistance
- Strengthening knowledge via research and surveillance
- Reducing infection incidence

### Reflection exercise 1

Antibiotic Awareness Week is November 14-20 this year. What specific actions will you take to educate customers and patients about antibiotic resistance, and promote antibiotic awareness and antibiotic guardians?

**Figure 2: Increased risk of resistant organism**

	Increased risk of resistant organism	
	Antibiotic in past 2 months	Antibiotic in past 12 months
UTI 5 studies: n = 14,348	2.5 times	1.33 times
RTI 7 studies: n = 2,605	2.4 times	2.4 times

Source: Meta-analysis by Costello et al, 2013

- Optimising the use of antimicrobial treatments
- Countering antimicrobial resistance through sustainable investment.

In 2013 the UK published an AMR strategy, which included seven key areas of action:

- Improving infection prevention and control
- Optimising prescribing practice
- Improving professional education, training and public engagement
- Better access to and use of surveillance data
- Improving the evidence base through research
- Developing new drugs, vaccines and other diagnostics and treatments
- Strengthening UK and international collaboration.

In England, antimicrobial use and resistance is monitored and reported nationally through the English Surveillance Programme for Antimicrobial Utilisation and Resistance (ESPAUR).

Among its findings the programme says the number of antibiotic resistant *Escherichia coli* bloodstream infections increased overall between 2010-14. While the proportion of resistance to key antibiotics used to treat infections has remained constant in *Escherichia coli*, the increased incidence of bloodstream infections means that more individuals have had a significant antibiotic resistant infection.

Increases in *Klebsiella pneumoniae* bloodstream infections and the proportion that are drug resistant means the number of individuals with antibiotic resistant infections has increased substantially in the past five years.

In 2014, the majority of antibiotics in England were prescribed in general practice (74 per

cent), followed by prescribing for hospital inpatients (11 per cent), hospital outpatients (7 per cent), patients seen in dental practices (5 per cent) and patients in other community settings (3 per cent).

Openly available data for benchmarking antimicrobial use in both primary and secondary care, with the introduction of hospital prescribing quality measures, is now available through the PHE Fingertips website ([fingertips.phe.org.uk/profile/amr-local-indicators](http://fingertips.phe.org.uk/profile/amr-local-indicators)). The data is part of an AMR local indicator data set that includes data on five domains (AMR, antibiotic prescribing, healthcare-associated infections, infection prevention and control, and antibiotic stewardship).

### Different roles

All healthcare workers have a role in tackling antimicrobial resistance.

- General practitioners, for example, can issue a delayed prescription for use at a later date by patients with self-limiting infections if symptoms get worse or do not improve. This strategy is recommended nationally as part of prudent antimicrobial stewardship to reduce antibiotic consumption in primary care for urinary, respiratory and conjunctival infections. Research has shown that the strategy reduces antibiotic use compared with

### AMR: a 10-point plan

A report by the Review on Antimicrobial Resistance has outlined a 10-point plan for tackling antimicrobial resistance. It includes launching a massive global public awareness campaign, reducing the unnecessary use of antimicrobials in agriculture and improving global surveillance of drug resistance in humans and animals.

The plan also stresses the importance of improving hygiene to prevent the spread of infection, promoting the development and use of vaccines, and calls for the uptake of rapid point-of-care diagnostics in primary and secondary care to cut unnecessary use of antibiotics.

Governments should consider a small levy on the pharmaceutical sector as one of the options to raise funding for the development of new antibiotics, says review chair Jim O'Neill. "I would find such a funding mechanism particularly attractive if it could be applied on a 'pay or play' basis, where those firms who invest in R&D that is useful for AMR can deduct their investment from the charge owed by all players within the industry."



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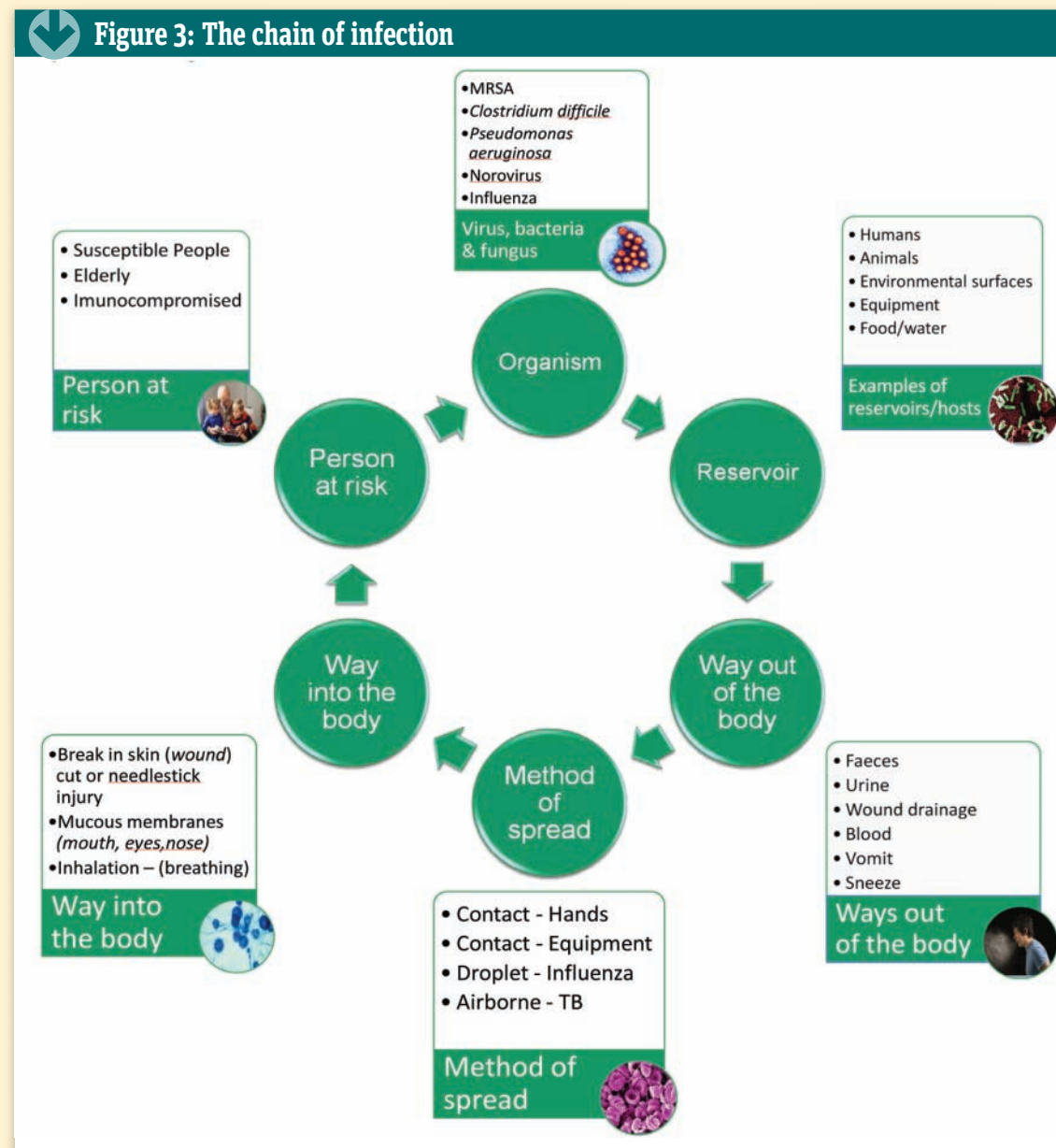


immediate antibiotics, without the increased risk of complications, and reduces future expectations for antibiotics

- Nurses can educate patients about the importance of hygiene in reducing infection risk and encourage responsible use of antibiotics
- Hospital prescribers can review those patients prescribed antibiotics at 48-72 hours and regularly thereafter in order to de-escalate or stop treatment where appropriate
- It is important to establish the role of community pharmacists in tackling AMR because 79 per cent of all antibiotic prescribing occurs in the community – yet there are few specialist antimicrobial pharmacists in this sector.

### Preventing infections

Preventing infections will play a major part in tackling antimicrobial resistance because it reduces the need for antibiotics in the first place. The chain of infection (See Figure 3, below) provides an overview of the process by which a person can acquire any type of infection.



### Hand hygiene

Hand hygiene is important in preventing transmission of infection in all health and social settings. Cleaning hands properly is the single most important thing anyone can do to help reduce the spread of infections.

Hands should always be washed with soap and water if they are visibly soiled or after using the toilet. Alcohol handrub can be used if hands are visibly clean but is not effective against some infections (e.g. *Clostridium difficile*).

The WHO recommends that washing hands properly takes about as long as singing 'Happy Birthday' twice, while 'My five moments for hand hygiene', guidance that defines the key moments when healthcare workers should carry out hand hygiene, can be adapted for community pharmacy as follows:

- Before touching a patient/service user (before a consultation)
- Before clean/aseptic procedures (before handling or dispensing medication)
- After body fluid exposure/risk (after consultations/dispensing medication)
- After touching a patient/service user
- After touching a person's surroundings.

In addition to hand hygiene, personal hygiene is also important. Long hair should be tied back, nails kept short and minimum jewellery worn. Rings with stones should not be worn as they are difficult to clean properly. Open wounds should be covered with an occlusive dressing and clinical gloves should only be put on immediately before use and disposed of appropriately afterwards. Glove use is not a substitute for good hand hygiene.

### Vaccination and resistance

The WHO estimates that flu causes about 250,000 to 500,000 deaths annually worldwide. Providing a vaccine service or signposting at-risk patients to somewhere they can receive their vaccination is an important public health service that can help stem the rise of antimicrobial resistance.

Vaccines can decrease the use of antibiotics directly by preventing primary infection and indirectly by preventing bacterial superinfection after a primary vaccine-preventable illness, such as influenza.

### Self-limiting infections

Community pharmacists and their teams are well-placed to provide effective advice for patients with self-limiting infections. Helping to manage patient expectations by explaining the likely duration of self-limiting infections (see Table 1) and the symptoms that require medical attention are also important contributions. For instance, one-third of the public believe that antibiotics will treat coughs and colds, and one in five people expect antibiotics when they visit their doctor.

Self-care advice that can also be offered includes:

- Getting plenty of rest
- Drinking enough fluids
- Taking paracetamol or ibuprofen for pain relief or to relieve a fever
- Protecting themselves and others against colds and flu (vaccination, hand washing to prevent the spread of viruses, using paper tissues and carefully disposing of them)

**Table 1: Duration of some common self-limiting illnesses**

Common self-limiting/viral infection	Usual duration
Middle-ear infection	4 days
Sore throat	7 days
Common cold	10 days
Sinusitis	18 days
Cough or bronchitis	21 days

## Reflection exercise 2

With your team, look at the table on page iv showing the expected duration of a sore throat, common cold, sinusitis and cough/bronchitis. How similar/different are these to your current practice and how might this information affect your decisions about when to refer someone to their GP? How would you explain the expected duration to a customer?

- Avoiding smoking or being in smoke-filled environments.
- ‘Red flags’ which indicate when to refer to the GP practice include:
  - Persistent raised temperature (39°C and above) for longer than three days
  - Severe headache with vomiting or severe earache
  - Coughing blood/blood stained mucus on more than one occasion
  - Chest pain
  - Difficulty in breathing or swallowing
  - Unusual skin rash
  - Confusion, slurred speech, drowsiness.


## Key resources

There are a number of key resources available to help ensure patients with self-limiting infections receive consistent messages from GPs, nurses and pharmacists.


The TARGET antibiotics toolkit is the national antimicrobial stewardship toolkit for primary care, which was developed by Public Health England in collaboration with the Royal College of General Practitioners and several other professional bodies. TARGET stands for: Treat Antibiotics Responsibly, Guidance, Education, Tools. It is a central resource designed to be used by the whole primary care team, with a focus on safe, effective, appropriate and responsible antibiotic prescribing.

The toolkit includes a patient information leaflet, ‘Treating your infection’ (see Figure 4). This leaflet can be used during consultations and given to patients to explain why they have not been prescribed antibiotics. The leaflet outlines the usual duration of common viral infections and self-care advice. Information on why antibiotics should only be taken when they are really needed is also provided. Initially developed for GP practices, the leaflet has been adapted for use within community pharmacy

Figure 4: ‘Treating your infection’ information leaflet



### Treating your infection



Patient Name  Your doctor or nurse recommends that you self-care









Your infection	Usually lasts	How to treat yourself better for these infections, now and next time	When should you get help: Contact your GP practice or contact NHS 111 (England), NHS 24 (Scotland dial 111), or NHS Direct (Wales dial 0845 4647)
<input type="checkbox"/> Middle-ear infection	4 days	<ul style="list-style-type: none"> <li>Have plenty of rest.</li> <li>Drink enough fluids to avoid feeling thirsty.</li> <li>Ask your local pharmacist to recommend medicines to help your symptoms or pain (or both).</li> <li>Fever is a sign the body is fighting the infection and usually gets better by itself in most cases. You can use paracetamol (or ibuprofen) if you or your child are uncomfortable as a result of a fever.</li> <li>Use a tissue and wash your hands well to help prevent spread of your infection to your family, friends and others you meet.</li> <li>Other things you can do suggested by GP or nurse:</li> </ul>	<p><b>1. to 8. are possible signs of serious illness and should be assessed urgently. Phone for advice if you are not sure how urgent the symptoms are.</b></p> <ol style="list-style-type: none"> <li>1. If you develop a severe headache and are sick.</li> <li>2. If your skin is very cold or has a strange colour, or you develop an unusual rash.</li> <li>3. If you feel confused or have slurred speech or are very drowsy.</li> <li>4. If you have difficulty breathing. Signs that suggest breathing problems can include:               <ul style="list-style-type: none"> <li>o breathing quickly</li> <li>o turning blue around the lips and the skin below the mouth</li> <li>o skin between or above the ribs getting sucked or pulled in with every breath.</li> </ul> </li> <li>5. If you develop chest pain.</li> <li>6. If you have difficulty swallowing or are drooling.</li> <li>7. If you cough up blood.</li> <li>8. If you are feeling a lot worse.</li> </ol> <p><b>Less serious signs that can usually wait until the next available GP appointment:</b></p> <ol style="list-style-type: none"> <li>9. If you are not improving by the time given in the ‘Usually lasts’ column.</li> <li>10. In children with middle-ear infection: if fluid is coming out of their ears or if they have new deafness.</li> <li>11. Other .....</li> </ol>
<input type="checkbox"/> Sore throat	7 days		
<input type="checkbox"/> Common cold	10 days		
<input type="checkbox"/> Sinusitis	18 days		
<input type="checkbox"/> Cough or bronchitis	3 weeks		
<input type="checkbox"/> Other infection: .....	..... days		

**Back-up antibiotic prescription to be collected after  days only if you do not feel better or you feel worse.**

Collect from:  GP reception  GP or nurse  Pharmacy

- Colds, most coughs, sinusitis, ear infections, sore throats, and other infections often get better without antibiotics, as your body can usually fight these infections on its own.
- If you take antibiotics when you don't need them, it allows bacteria to build up resistance. This means, they're less likely to work in the future, when you really might need them.
- Antibiotics can cause side effects such as rashes, thrush, stomach pains, diarrhoea, reactions to sunlight, other symptoms, or being sick if you drink alcohol with metronidazole.

Never share antibiotics and always return any unused antibiotics to a pharmacy for safe disposal

Leaflet developed in collaboration with these professional societies.

and is freely available via the Royal College of General Practitioners website ([www.rcgp.org.uk/clinical-and-research/target-antibiotics-toolkit.aspx](http://www.rcgp.org.uk/clinical-and-research/target-antibiotics-toolkit.aspx)).

A booklet ‘When Should I Worry?’, developed by researchers at Cardiff University, is another very useful resource. It provides information for parents about the management of respiratory tract infections (coughs, colds, sore throats and ear ache) in children, and has been designed for use in primary care consultations. The booklet covers the usual expected duration of these infections, self-care advice and when a doctor should be consulted. Information can be found at [whenshouldiworry.com](http://whenshouldiworry.com). The PDF is freely available to download and colour glossy booklets (in bundles of 50) are available through the RCGP bookshop (currently £11 for 50).

## Clinical scores for sore throat

FeverPAIN and Centor criteria are two clinical scoring systems used by GPs to determine which patients presenting with sore throats should receive an antibiotic. While antibiotics are unnecessary in the majority of patients

presenting with acute sore throat, whether the sore throat is because of streptococcal or viral infection, it is important to be aware that sore throat may also represent a more serious bacterial infection caused most commonly by group-B haemolytic streptococcus.

FeverPAIN is a five-item score based on one score each if the following are present:

- **Fever**
- **Purulence**
- **Attend rapidly** (three days or less)
- **Severely Inflamed tonsils**
- **No cough or coryza.**

For a FeverPAIN score of 1, no antibiotics are required, but it is important to provide the patient with self-care advice for symptom relief.

For a FeverPAIN score of 2-3, the GP might consider a back-up/delayed antibiotic prescription.

For a score of  $\geq 4$ , an immediate antibiotic should be considered if symptoms are severe or a short (48 hours) delayed prescribing strategy followed.

The FeverPAIN scoring system can be found at <https://ctu1.phc.ox.ac.uk/feverpain/index.php>.



Centor criteria is a history of fever; absence of cough; tender anterior cervical lymphadenopathy and tonsillar exudates.

A low Centor score (0-2) has a high negative predictive value (80 per cent) and indicates low chance of Group A Beta Haemolytic Streptococci (GABHS). A Centor score of 3 or 4 suggests the chance of GABHS is 40 per cent.

If a patient is unwell with a Centor score of 3 or 4, then the chance of developing quinsy is 1:60.

The Centor criteria can be found at [mdcalc.com/modified-centor-score-for-strep-pharyngitis](http://mdcalc.com/modified-centor-score-for-strep-pharyngitis).

## Sepsis

While it is important to prevent the emergence of antimicrobial resistance by limiting antibiotic use, it is very important to be aware of life-threatening conditions such as sepsis – a common and potentially life-threatening state triggered by an infection.

Warning symptoms that require urgent medical attention include:

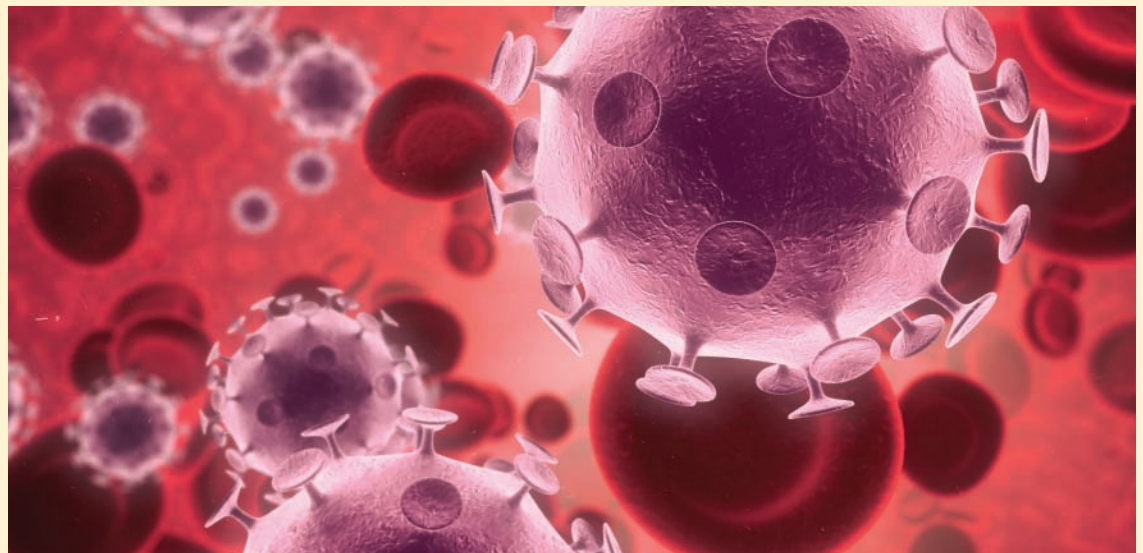
- Slurred speech
- Extreme shivering or muscle pain
- Passing no urine (in a day)
- Severe breathlessness
- Comments along the lines of “I feel like I might die”
- Skin mottled or discoloured.

## Monitoring antibiotic use

Pharmacists have an important role to play in monitoring antibiotic use as they clinically screen drugs as part of their everyday practice. Pharmacists should also be mindful of the potential for antibiotic-related drug-drug interactions. Interactions concerning the fluoroquinolone and macrolide classes of antibiotic are particularly important in this regard.

Most clinical commissioning groups will have local infection management guidelines, often adapted from the national antibiotic management guidance developed by Public Health England. It is important to have an up-to-date copy of the antibiotic guidelines available. When screening antibiotic prescriptions the following should be considered:

- Is the prescribed antibiotic the most appropriate for the infection according to guidelines?



The effects of antimicrobial resistance are already being seen in clinical practice



## Antibiotic Guardian campaign

Developed in 2014, the Antibiotic Guardian campaign calls on everyone in the UK, both healthcare professionals and members of the public, to become a guardian by selecting a pledge about how each will make better use of antibiotics and help save these vital medicines from becoming obsolete. You can choose your pledge and encourage your customers/patients to do the same at [antibioticguardian.com](http://antibioticguardian.com). You can also join the conversation on social media via Facebook or Twitter using the hashtag #AntibioticGuardian

- Is the dose, route, frequency and duration appropriate for the patient?

If a patient presents with an antibiotic prescription that is post-dated or is being presented several days or weeks after the date of issue, it is important to determine if the same antibiotic is still required. It may be prudent to contact the prescriber if, for example, symptoms have worsened or there are other warning symptoms.

## Using antibiotics effectively

On receipt of a prescription for an antibiotic, pharmacy teams should ask the patient three key questions:

- **What has the antibiotic been prescribed for?**

This is to help ensure appropriateness. In addition, before reconstituting liquid antibiotics, it is worth checking if the course is due to start immediately or if it is for a delayed prescription,

as some patients may not realise the short expiry once reconstituted.

- **Are there any known allergies?**

This information is also available through summary care records. Record allergies on the PMR system.

- **If applicable, have they had their flu vaccination?**

When handing over the dispensed antibiotics, patients should be provided with the following key messages and encouraged to ask any questions:

- Take the medicine as prescribed (state dose, frequency and duration)
- Don't share antibiotics with others or reuse them after the stated duration.

Patients should also be advised on alcohol intake with antibiotics. While it is sensible to avoid drinking alcohol when taking medication or feeling unwell, only metronidazole and tinidazole require complete abstinence from alcohol during the course and for 48 hours (metronidazole) and 72 hours (tinidazole) after its completion. Anecdotally, many members of the public believe they cannot drink any alcohol with all antibiotics and stop courses early because of this.

Alcohol can cause a serious (disulfiram-like) reaction when combined with these medications. Symptoms of a disulfiram-like reaction include:

- Breathlessness
- Headache

### Reflection exercise 3

Talk with your team about pledging to become an Antibiotic Guardian and discuss who in the team will take the lead on different aspects of antimicrobial resistance.

- Chest pain
- Skin flushing
- Increased or irregular heartbeat
- Light headedness
- Nausea and vomiting.

Other antibiotics that alcohol can interact with (and where caution is required) include:

- Co-trimoxazole – similar reaction to that of metronidazole or tinidazole, although this is very rare; drinking alcohol in moderation does not normally cause a problem
- Linezolid – undistilled (fermented) alcoholic drinks such as wine, beer, sherry and larger can interact with this medicine
- Doxycycline – alcohol intake, especially in

people with a history of chronic alcohol consumption, can reduce the effectiveness of doxycycline

- Erythromycin – alcohol may slightly reduce or delay its effect.

### Getting the message across

Posters, leaflets, quizzes and videos to educate the public, other pharmacy staff and healthcare professionals are available through national campaigns in the UK.

European Antibiotic Awareness Day (EAAD) is a Europe-wide initiative held each year on November 18, while the WHO launched World Antibiotic Awareness Week to run during the same week. Active promotion of EAAD is one of the key strategies listed by the Department of Health as being important in the UK five-year antimicrobial resistance strategy. Educational materials and resources that can be used as part of a health promotion campaign are available

via the Public Health England website ([gov.uk/government/collections/european-antibiotic-awareness-day-resources](http://gov.uk/government/collections/european-antibiotic-awareness-day-resources)).

### Acknowledgments

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- Details of source material available from the Editor.

### Reflection exercise 4

What three things will you do differently as a result of completing this CPD module?

### Further learning & reading

#### Centre for Pharmacy Postgraduate Education

Resources available from CPPE include:

- Antibacterials 'focal point', which helps pharmacy teams to support other health professionals and patients to maximise patient outcomes in antibiotic therapy while minimising harm
  - Antibacterials [learning@lunch](mailto:learning@lunch), which helps to provide pharmacists with a better understanding of how to assess and monitor patients requiring antibacterial therapy in an acute setting
  - [Thelearningpharmacy.com](http://Thelearningpharmacy.com) antibacterials floor, which provides information accessible to all members of the pharmacy team including medicines counter staff
- See [cppe.ac.uk](http://cppe.ac.uk).

#### Health Education England

The level 1 e-learning module 'Reducing antimicrobial resistance' has been designed to support all health and social care staff – both clinical and non-clinical – to understand the threats posed by antimicrobial resistance and ways they can help to tackle this major health issue. The programme, which has been developed by Health Education England in collaboration with Public Health England and NHS England, has free access.

#### Public Health England antibiotic guideline

Guidance on diagnosis of infections, using the microbiology laboratory, and appropriate use of antibiotics and antifungals in primary care. See [gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections](http://gov.uk/government/collections/primary-care-guidance-diagnosing-and-managing-infections).

#### TARGET toolkit

The Treat Antibiotics Responsibly, Guidance, Education, Tools (TARGET) antibiotic toolkit for primary care aims to help influence prescribers' and patients' personal attitudes, social norms and perceived barriers to optimal antibiotic prescribing. See: [rcgp.org.uk/clinical-and-research/toolkits/target-antibiotics-toolkit.aspx](http://rcgp.org.uk/clinical-and-research/toolkits/target-antibiotics-toolkit.aspx).

#### NICE antimicrobial stewardship guidelines and quality standards

NICE has recently produced two guidelines and one set of quality standards on antimicrobial stewardship:

- NICE antimicrobial stewardship: systems and processes for effective antimicrobial

medicine use: This guideline covers the effective use of antimicrobials (including antibiotics) in children, young people and adults. It aims to change prescribing practice to help slow the emergence of antimicrobial resistance and ensure that antimicrobials remain an effective treatment for infection.

See [nice.org.uk/guidance/ng15](http://nice.org.uk/guidance/ng15)

- Antimicrobial stewardship quality standards: See [nice.org.uk/guidance/qs121](http://nice.org.uk/guidance/qs121)
- Antimicrobial stewardship – changing risk-related behaviours in the general population. The publication date is to be confirmed but the scope and draft for consultation can be seen at [nice.org.uk/guidance/indevelopment/gid-phg89/documents](http://nice.org.uk/guidance/indevelopment/gid-phg89/documents).

#### Expert curriculum on infection management and antimicrobial stewardship for pharmacists

The UKCPA Pharmacy Infection Network (formerly Infection Management Group) has developed a specialist curriculum for antimicrobials and infection covering five key areas:

- Setting the scene: infection and antimicrobial stewardship in context
- Clinical microbiology
- Antimicrobials
- Management of clinical syndromes (by BNF body system category)
- Principles of an antimicrobial stewardship plan.

The curriculum provides a comprehensive competency-based programme for the professional development of antimicrobial pharmacists. It has been approved by the Royal Pharmaceutical Society and is endorsed by BSAC.

#### E-bug

This is a European-wide antibiotic and hygiene teaching resource for junior and senior school children, which is freely available via [e-bug.eu](http://e-bug.eu).

#### The AMR resource handbook

This identifies current national policy, guidance and supporting materials in relation to the prevention and control of healthcare-associated infections (HCAI) and antimicrobial stewardship in order to help reduce antimicrobial resistance. It is designed to assist local health and social care professionals in quickly retrieving relevant information.



Pharmacy Magazine's CPD modules are available on Cegedim Rx's PMR systems, Pharmacy Manager and Nexphase. Just click on the 'Professional Information & Articles' button within Pharmacy KnowledgeBase and search by therapy area. Please call the Cegedim Rx helpdesk on 0844 630 2002 for further information.



ANTIMICROBIAL STEWARDSHIP

# assessment questions

- What percentage of the public believes that antibiotics will treat coughs and colds?
  - 13 per cent
  - 24 per cent
  - 33 per cent
  - 41 per cent
- Which of the following statements is not a 'red flag' in relation to an infection?
  - Confusion, slurred speech, drowsiness
  - Difficulty breathing
  - Severe headache with severe earache
  - Persistent raised temperature above 38°C in an adult
- Which of the following requires antibiotic treatment assuming no allergy and no significant medical history?
  - A 46-year-old lady with cellulitis
  - A seven-year-old girl with ear ache
  - A four-year-old boy with sore throat and temperature for 3 days
  - A 35-year-old man with cough for eight days
- Which statement about delayed antibiotic scripts is supported by research evidence? They:
  - Reduce antibiotic use compared with immediate antibiotics without increased risk of complications
  - Have no effect on patients' future expectations for antibiotics
  - Reduce antibiotic use compared with immediate antibiotics but with a slightly increased risk of complications
  - Have no effect on antibiotic use but do reduce patients' future expectations for antibiotics
- Which statement contains the correct expected durations of common self-limiting infections?
  - Middle ear infection 7 days, sore throat 7 days, common cold 7 days, sinusitis 10 days
  - Middle ear infection 4 days, sore throat 7 days, common cold 10 days, sinusitis 18 days
  - Middle ear infection 4 days, sore throat 7 days, common cold 10 days, sinusitis 14 days
  - Middle ear infection 7 days, sore throat 5 days, common cold 10 days, sinusitis 18 days
- European Antibiotics Awareness Day is held on which day?
  - November 18
  - June 18
  - October 18
  - December 18
- Which statement is correct in relation to handwashing and infection? Alcohol handrub is/can:
  - Not effective against *E. Coli*
  - Effective against all infections
  - Not effective against *Clostridium difficile*
  - Be used even if hands are soiled
- In England, what percentage of antibiotics are prescribed by GPs?
  - 66 per cent
  - 70 per cent
  - 74 per cent
  - 78 per cent

Use this form to record your learning and action points from this module on **Antimicrobial Stewardship** or record on your personal learning log at [pharmacymagazine.co.uk](http://pharmacymagazine.co.uk). You must be registered on the site to do this. Any training, learning or development activities that you undertake for CPD can also be recorded as evidence as part of your RPS Faculty practice-based portfolio when preparing for Faculty membership. So start your RPS Faculty journey today by accessing the portfolio and tools at [www.rpharms.com/Faculty](http://www.rpharms.com/Faculty).

Activity completed. (Describe what you did to increase your learning. Be specific) **(ACT)**

Date: \_\_\_\_\_ Time taken to complete activity: \_\_\_\_\_

What did I learn that was new in terms of developing my skills, knowledge and behaviours? Have my learning objectives been met? **(EVALUATE)**

How have I put this into practice? (Give an example of how you applied your learning). Why did it benefit my practice? (How did your learning affect outcomes?) **(EVALUATE)**

Do I need to learn anything else in this area? (List your learning action points. How do you intend to meet these action points?) **(REFLECT & PLAN)**

You can also record in your personal learning log at [pharmacymagazine.co.uk](http://pharmacymagazine.co.uk)

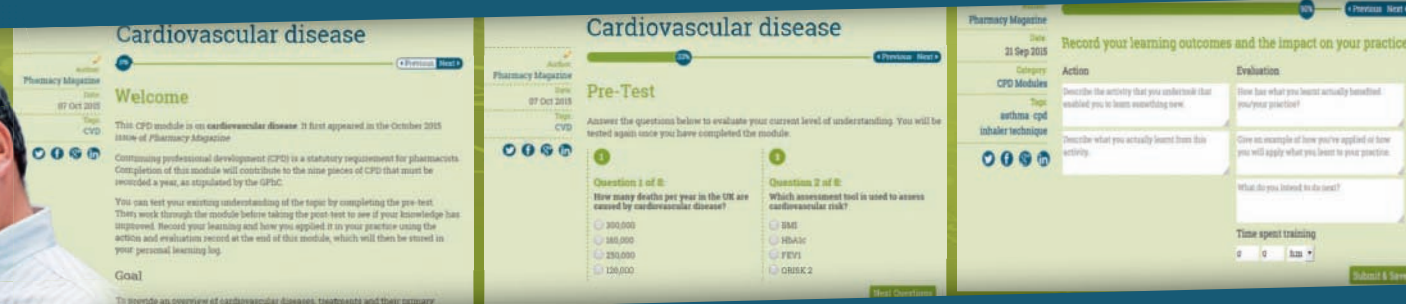


\* If as a result of completing your evaluation you have identified another new learning objective, start a new cycle. This will enable you to start at Reflect and then go on to Plan, Act and Evaluate. This form can be photocopied to avoid having to cut this page out of the module. You can also complete the module at [www.pharmacymagazine.co.uk](http://www.pharmacymagazine.co.uk) and record on your personal learning log

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