

Antimicrobial Resistance and Stewardship – a Focus on the Commonwealth

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Introduction

Antimicrobial resistance (AMR) is an accepted threat to global health security, but it is not a new problem. When Alexander Fleming discovered penicillin, he warned of the risk of development of resistance during his Nobel prize speech in 1945. He said, "The microbes are educated to resist penicillin and a host of penicillin-fast organisms is bred out which can be passed on to 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."

Although there is a lot of talk about antibiotic resistance in the future, it is important to realise that we are already seeing the impact of resistant infections in everyday life. For example, many urinary tract infections are becoming resistant, which can lead to people requiring a hospital stay. It is inconceivable to think that by 2050 as many people are predicted to die of drug resistant infections as cancer, if antimicrobial resistance (AMR) is not tackled now ^[1].

AMR is markedly more common in some parts of the world than others. For example, in 2013 there were 214,000 neonatal deaths globally attributable to resistant sepsis infections, and of these, over half occurred in just five countries, three of which were the Commonwealth countries of India, Pakistan and Nigeria ^[2].

A major area of concern is multi-drug resistant tuberculosis (MDR-TB) – that is TB that is resistant to the two most powerful anti-TB drugs. The World Health Organisation (WHO) estimated that in 2014, there were about 480,000 new cases of MDR-TB. Similarly, we are seeing outbreaks of malaria, gonorrhoea and fungal infections that are all multi-resistant. The failure of treatment for gonorrhoea has been confirmed in at least 10 countries including the UK, Australia and Canada ^[1].

A global action plan on antimicrobial resistance (AMR) was endorsed at the World Health Assembly (WHA) in May, 2015, reflecting the global agreement on the profound threat AMR poses to human health ^[2]. This plan aims to ensure that the prevention and treatment of infectious diseases with safe and effective medicines continues, based on five strategic objectives:

1. To improve awareness and understanding of AMR
2. To strengthen surveillance and research
3. To reduce the incidence of infection
4. To optimize the use of antimicrobial medicines
5. To ensure sustainable investment in countering antimicrobial resistance

The CPA will be working in collaboration with its member organizations, particularly supporting points 1 and 4 above, to help pharmacists to do their part in tackling AMR in their own countries.

The Commonwealth now has its own Policy Brief on AMR (<https://www.thecommonwealth-healthhub.net>). In the two years that have been allotted to reporting back with an action plan in response to the UN declaration, there is a need to work together in the collaborative spirit of the Commonwealth to ensure that these action plans are not only well thought out and effective but fully engage all stakeholders, including health care professionals and the public to maximize success and ensure that action follows commitment.

Also this year, the WHO Essential Medicines List ^[3] was released with the biggest update to its antibiotics section in 40 years.

National AMR Action Plans

It is expected that individual national action plans will be developed by all countries based on the global plan.

To date, of the 52 countries in the Commonwealth, 11 have publicly published available national AMR action plans on the WHO website (Table 1) ^[5].

With regards to the use of antimicrobials, the CPA particularly recognises the challenges faced to ensure sufficient access to antibiotics when needed, whilst preventing the excessive and injudicious use.

Many issues exist around the use of antimicrobials, including the incidence of substandard antibiotics, regulation and the enforcement of regulations around medicines supply, poor advice, misinformed prescribing habits, lack of guidelines and diagnostics and patient and practitioner beliefs about taking antibiotics. All of these need to be addressed within a wider one health agenda, if we are to ensure that we have a chance to prevent the progression of AMR at a global level.

Pharmacists are involved in the whole medicines use process, from the supply and regulation of medicines to often being the last healthcare professional that a patient has contact with before taking an antibiotic. The CPA would encourage the involvement of pharmacists in national AMR action plans from both a professional and government level to ensure all aspects of medicine use are covered.

The CPA are seeking to raise awareness of the urgency of this problem and of the importance of including pharmacists in national action plans. Recently, in October 2016 the CPA were able to deliver a statement on to this effect to health ministers from around Commonwealth at the Commonwealth Advisory Committee on Health (CACH) in Colombo, Sri Lanka. The CPA also initiated AMR forums at the Commonwealth Medical Association conference in Colombo (October, 2016) and their own biennial conference due to take place in Sydney in collaboration with the Pharmaceutical Society of Australia (July, 2017).

Table 1: Publically available AMR action plans in the Commonwealth

Country	Date published
Australia	2015
Bangladesh	2017
Barbados	2017
Canada	2014
Cyprus	2012
Fiji	2015
India	2017
South Africa	2014
Sri Lanka	2017
UK	2013
Tanzania	2017

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Tackling AMR is Everyone's Business

AMR has clear links to not just human health but also animal health, farming and the environment. Increasingly recognised is the importance of tackling AMR using what is known as a 'one health' approach – a collaborative effort of multiple disciplines to attain optimal health for people, animals and our environment.

Everyone has a role in tackling AMR: governments, professional organisations, pharmaceutical companies, healthcare professionals and perhaps most importantly, the public.

The wider healthcare team certainly has a big role to play. Educating the public and managing the expectations of patients is a key role for all healthcare professionals and its importance must not be underestimated.

Pharmacists and pharmacy teams have a key role in antimicrobial stewardship and an important role in educating the public with self-care advice. Pharmacists can make important contributions to public knowledge, awareness and managing their expectations. It is important to establish the role of community pharmacists in tackling AMR because the majority of antimicrobial prescribing occurs in the community.

How Pharmacists can Help Tackle AMR

1. Stewardship

Antimicrobials, in particular antibiotics, are commonly prescribed medicines. Evidence shows that antibiotic resistance is linked to antibiotic use. The clinical, public health and economic implications of antimicrobial resistance presents a major threat to future healthcare. Prudent use of antibiotics through antimicrobial stewardship is essential for patient safety, ensuring that patients get the right antibiotic, at the right dose, right time and for the right duration and to contain and control resistance. For this, well-trained and adequately skilled pharmacists and pharmacy staff, in conjunction with the proper regulation on prescription medicines such as antibiotics are key to tackling this global health problem.

Pharmacists have a role to play as they 'clinically screen' drugs as part of their everyday practice. Pharmacists also should 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. When checking medicines prescribed, it is important to check that antibiotics are prescribed appropriately and querying those that appear to be prescribed outside of local/national guidelines.

If international or national guidelines are available in your country, when screening antibiotic prescriptions the following should be considered:

- Is the prescribed antibiotic the most appropriate for the infection according to guidelines?
- Is the dose, route, frequency and duration appropriate for the patient?

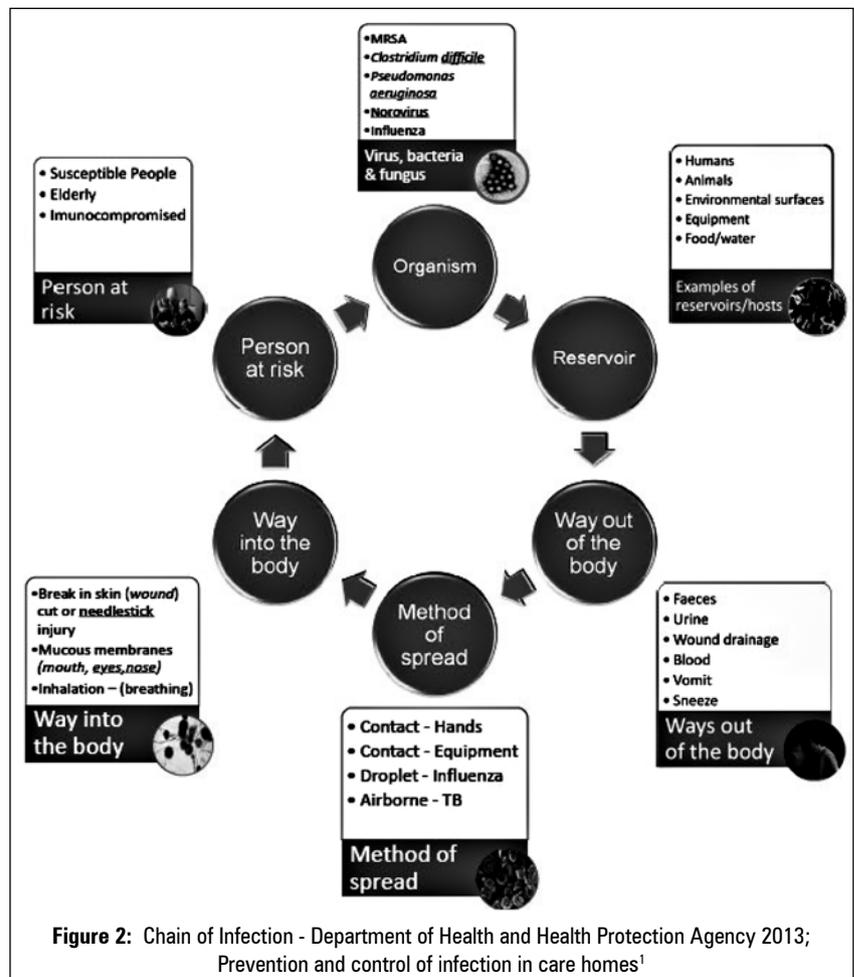
Pharmacists can also prompt the review of patients prescribed antibiotics at 48-72 hours and regularly afterwards, and de-escalate (eg. switch to intravenous to oral) or stop treatment where appropriate.

2. Education on infection prevention

Preventing infections in the first place will help reduce antimicrobial

resistance because it reduces the need for using antibiotics. The Chain of infection (Figure 2) illustrates how infections can spread and the need for good methods of infection prevention.

Hand hygiene is important in preventing transmission of infection in all health and social settings. Cleaning hands properly is the most important thing everyone can do to help reduce the spread of infections. Hands should always be washed with soap and water if hands are visibly soiled, or after using the toilet. Alcohol hand rub can be used if hands are visibly clean, but it is not effective against some infections such as *Clostridium difficile*.



The WHO recommends that washing your hands properly takes about as long as singing 'Happy Birthday' twice. Recommendations on when to use hand hygiene are also defined in the WHO publication 'My 5 moments for Hand Hygiene' [4].

3. Encourage at risk patients to uptake vaccines if they are available

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

The WHO estimates that flu causes about 250,000 to 500,000 deaths annually worldwide [4]. Flu vaccinations can help reduce complications or severity of flu symptoms, hence reducing the need for antibiotics to be prescribed for flu symptoms.

Vaccination clinics (in particular flu and travel vaccines) are an important public health service that community pharmacists in some countries are actively providing, a very practical and effective way to

contribute to preventing the rise of AMR. In the absence of being involved with such a service, pharmacy staff can signpost at risk patients to where they can receive vaccinations.

4. Encourage self-care

Pharmacies are often the first port of call for members of the public with 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 and symptoms that require medical attention are also important contributions. This is one way that community pharmacy can contribute to reducing the rise of AMR that occurs as a result of inappropriate/over-use of these medicines. Requests for the inappropriate supply of antibiotics can also be responded to by self-care advice, through recommendation of non-medicinal and medicinal methods for symptomatic relief.

When consulting with patients, the WWHAM acronym commonly in the UK (Table 2) is a helpful guide to ensure all key points are covered. In addition to this, always remember to ask about allergies.

One of the key points to cover with patients is the usual duration of self-limiting illnesses, which can often be much longer than five days (Table 3). For example, cough or bronchitis can last up to 21 days, sinusitis up to 18 days, the common cold 10 days and sore throat around seven days.

Table 2: WWHAM consultation questions

W	Who is the patient?
W	What are the symptoms?
H	How long have the symptoms been present?
A	Action taken?
M	Medication being taken?

Table 3: Usual duration of common self-limiting infections ^[4]

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

Self-care advice includes:

- Get plenty of rest
- Drink enough fluids
- Taking paracetamol or ibuprofen for pain relief or to relieve fever
- Protecting themselves and others against colds and flu (vaccination, hand washing to prevent spread of viruses, using paper tissues and carefully disposing of them)
- Avoiding smoking or being around smoke filled environment

When giving self-care advice, it is important to tell patients the warning symptoms of worsening illness; especially if it is a weekend and give advice/ signpost to out of hours services locally.

5. Reduce excess, but enable access when antibiotics are truly needed

Whilst it is important to prevent the emergence of antimicrobial resistance by limiting use to only when it is necessary, it is equally important for pharmacists to be aware of life threatening conditions such as sepsis which is a common and potentially life-threatening condition triggered by an infection.

Therefore, it is also important to realise when a patient is potentially at risk of becoming very sick without the proper medical attention. This includes recognising 'red flags' and knowing when to refer to a doctor – some key indicators are listed below:

- Persistent raised temperature (39°C and above) for longer than 3 days
- Severe headache with vomiting or severe earache
- Coughing blood blood/blood stained mucus on more than one occasion
- Chest pain
- Difficulty in breathing or swallowing
- Unusual skin rash
- Confusion, slurred speech, drowsiness

Sepsis is a life threatening condition and must be treated quickly with antibiotics usually in a hospital setting. It is important that we ensure the effectiveness of antibiotics to be able to treat serious infections such as this. Community pharmacists in particular need to be aware of the sepsis warning symptoms that require urgent medical attention (Figure 3).

6. Helping patients to use their prescribed antibiotics effectively

On receipt of prescriptions for antibiotics, pharmacists or experienced pharmacy team members should aim to ask the patient two key questions:

1. What the antibiotic has been prescribed for?
This is to help ensure appropriateness.

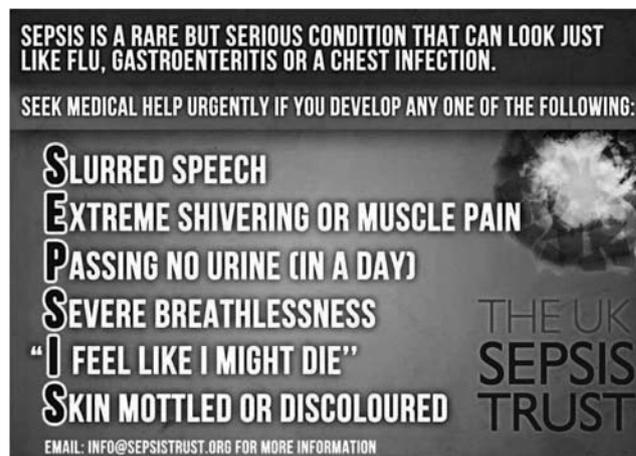


Figure 3: Sepsis warning symptoms – UK Sepsis Trust ^[4]

2. Are there any known allergies?

When handing over the dispensed antibiotics, encourage patients to ask questions or share concerns about their antibiotic prescriptions. The following key messages should be provided to the patient:

- Take their medicine as prescribed (state dose, frequency and duration)
- Do not share antibiotics with others or reuse them after the stated duration
- Self-care information for management of their particular infection
- Advice on alcohol intake with the antibiotics: Whilst it is sensible to avoid drinking alcohol when taking medication or feeling unwell only metronidazole and tinidazole require complete abstinence from alcohol during course and for 48 hours (metronidazole) and 72 hours (tinidazole) after completing the course. Anecdotally, many members of the public believe they cannot drink any alcohol with all antibiotics

and stop courses early because they believe they cannot drink at all with them.

7. Raise awareness of AMR

Posters, leaflets, quizzes and videos to educate the member of the public, other pharmacy staff and healthcare professionals are available through national campaigns in some countries, such as the Public Health England website in the UK: <https://www.gov.uk/government/collections/european-antibiotic-awareness-day-resources>

Becoming an antibiotic guardian www.antibioticguardian.com (and encouraging others to do the same) is one way that you can pledge to protect this valuable resource. Developed in 2014, the Antibiotic Guardian campaign calls on everyone, both healthcare professionals and members of the public, to become antibiotic guardians by selecting a pledge relating to how each will make better use of antibiotics.

You can join the conversation on social media via Facebook or twitter in particular using the hashtag #AntibioticGuardian

Look out for campaigns you can join in with, especially around World Antibiotic Awareness Week (WAAW). This is a great opportunity to emphasize the problem and increase awareness and engagement.

The CPA'S Contributions to Tackling AMR During World Antibiotics Awareness Week 2016

For WAAW 2016, the CPA did 5 things to promote the AMR agenda and support pharmacists around the Commonwealth in tackling the problem in their own countries:

1. Promotion of Antibiotic Guardian Campaign

The Commonwealth Pharmacists Association (CPA), in collaboration with our member organizations, has been working to increase awareness of AMR since July 2016 by widely publicizing through our networks the Antibiotic Guardian campaign that began in England to encourage people to commit to better use of antimicrobials. Antibiotic Guardian Pledges are grounded in the behaviour change theory, acting as a driver to improve behaviours around antibiotic prescribing and antibiotic use. We would encourage you to join us in increasing awareness, by becoming an Antibiotic Guardian yourselves and spreading this opportunity to pledge amongst your networks. We can all pledge to do something, whether we are healthcare professionals who can think twice before prescribing antibiotics, patients who can ensure that they take medicines correctly or members of the public that will commit to hand hygiene. For WAAW 2016, we developed and disseminated a new flyer to our member organizations to promote the Antibiotic Guardian Campaign and invited them to disseminate this to their own members.

Become an Antibiotic Guardian today by visiting www.antibioticguardian.com

Readers are encouraged to choose a personal pledge from the Antibiotic Guardian website about how they can personally contribute to help tackle Antimicrobial resistance and to share the website with colleagues, family and friends. Example of a pledge for pharmacist is

- When handing out a prescription that includes antibiotics, I will inform the patients of dose and duration and to take their antibiotics exactly as prescribed and to return any unused antibiotics to a pharmacy for safe disposal.

Examples of public pledges:

- Sing the ABC song when washing our hands with soap and water. Washing hands properly (at least 30 seconds), especially

before eating, is the single best way to prevent the spread of infections and keep your family healthy.

- If anyone in my family is prescribed antibiotics, I will ensure they are taken exactly as prescribed and never shared with others.

There are also organisation level pledges e.g.

- Between September and November, we will champion/plan key promotional activities for EAAD and first World Antibiotic Awareness Week within our local area and to members of our organisation.
- As an organisation, we will work to help develop a national action plan for our country on antimicrobial resistance in line with the global plan.
- In support of the first WAAW, our organisation will share another country's AMR messages to demonstrate global efforts to reduce AMR.
- As a public health institution, when we release materials on AMR, we will aim to use language which will minimise public misconceptions on drug-resistant infections.

2. Launch of new antimicrobial stewardship resource hub

The CPA launched our new website the week prior to WAAW 2016 and used this opportunity to introduce a new resource hub for members, the 'Antimicrobial Stewardship portal'. This 'toolkit' signposts users to resources and information that promotes learning about microbiology and antimicrobial stewardship. Access to this resource (which was funded by Health Education England North Central and East London) has been a collaborative effort by the CPA, Royal Pharmaceutical Society and University College London.

3. Letter and press release

The CPA wrote to the presidents of pharmaceutical associations around the Commonwealth, informing them of the CPA's plans to mark WAAW 2016 and provided them with ideas of the types of resources that might be useful to them and their members in supporting this awareness week and beyond. We signposted them to the AMS portal, other helpful resources, the Commonwealth Policy Brief and the Antibiotic Guardian campaign, inviting them to add a link to this in their email signature. We also attached a press release for them to adapt themselves and share with their members.

4. Discussion on the Commonwealth HealthHub

To coincide with the launch of the Commonwealth's new AMR policy document the CPA initiated and helped to moderate a discussion entitled 'Is antimicrobial Resistance (AMR) relevant if you can't afford the drugs?' on the Commonwealth Health Hub. This was launched during the week of WAAW 2016. This raised awareness and gave a platform for healthcare professionals, policy makers and government representatives to engage in discussions about the challenges faced in tackling AMR. A report on this discussion can be viewed at: <https://www.thecommonwealth-healthhub.net>.

5. Survey of member organizations

The CPA conducted a survey on AMR amongst its member organisations around the Commonwealth. The aim of this was to raise awareness of AMR, gauge the current situation around medicines legislation, WAAW activities and support for the behaviour change campaign Antibiotic Guardian, which the CPA were promoting.

The CPA created a short 10-point questionnaire that was distributed to 36 member organizations via Survey Monkey four weeks prior to WAAW 2016. It investigated activities that were planned to mark this week and what activities they were already engaged in relating to AMR.

There was a good response, with 72.2% of organizations (n=36) responding to the survey. Of the countries represented, although 92.3% had legislations preventing sale of antibiotics without a prescription, only half claimed legislations were abided by. Legally in 95.2% of countries, a pharmacist must be present when supplying antibiotics, but according to our results, in only half of the countries represented was this legislation enforced. All organisations were aware AMR was a global priority and all were willing to become and promote the Antibiotic Guardian campaign. Promotion of this initiative by CPA in 2016, saw a 56% increase (total 432) in the number of Antibiotic Guardians in Commonwealth countries compared to 2015.

From this work, the CPA concluded that there is potential to increase implementation of legislation around supply of medicines and reach of antibiotic stewardship programmes. Support of the Antibiotic Guardian campaign was unanimous, though there is scope for supporting organizations to run their own awareness-raising initiatives for WAAW.

There is clearly still work to do in the Commonwealth to address enforcement of legislations around medicines and to support pharmacists in tackling AMR. As a follow on from this survey we asked pharmacists around the Commonwealth if they would like webinar training on tackling AMR. The result was a unanimous 'Yes', so we engaged our AMR advisor Dr Diane Ashiru-Oredope to lead the first webinar in a series (due to begin on 13th July, 2017), looking at the role of the pharmacist around the Commonwealth in tackling AMR.

Concluding Remarks

AMR is today's problem and it needs to be top of all our agendas. As we are sure you are all too fully aware, this is not an easy issue to solve, and increasing awareness of AMR and optimizing the use of antibiotics are only part of the solution, but we can all play a part no matter how small.

In true Commonwealth spirit, let's commit to work together and share the tools, resources and expertise that we have to support all our nations in developing and delivering effective action plans.

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