Module 1: Understanding antibiotic resistance and the role of URTI management in primary care
Learning objectives

• To **understand** the concept of antibiotic resistance, how it develops and to identify driving factors of increasing resistance rates

• To **acknowledge** the threat of antibiotic resistance and the importance of antibiotic stewardship within primary care

• To **improve awareness** and **understanding** of when antibiotic use is appropriate for patients with URTIs
Introduction

Antibiotic resistance is a global threat to public health.\(^1\) High rates of resistance have been identified in all of the World Health Organization (WHO) regions.\(^1\)

The risk of a post-antibiotic era for the 21st century is high, where everyday infections are untreatable could be a very real possibility.\(^1\)

"AMR [Antimicrobial resistance] is a global health security threat that requires action across government sectors and society as a whole."

– WHO, 2014\(^1\)

How does antibiotic resistance develop?

Antibiotic resistance develops when bacteria evolve to withstand treatment from antibiotics, multiply and form a drug-resistant strain.\(^1,2\) This could result in persistent infections that are more difficult to treat and allow more time for the infection to spread to others.\(^1,3\)

The body is also host to many useful bacteria that can help prevent pathogens from causing infections\(^4\) – these are often also attacked by antibiotic use.

In the case of a normal pathogenic bacterial infection, the immune system can usually clear it within a few days without the need for antibiotics.\(^5\)

What causes antibiotic resistance?

The more antibiotics we use, the more bacteria will evolve to become resistant.¹

Driving factors for antibiotic resistance include:¹⁻³

- **Antibiotic use** (including overuse, inappropriate dosing and misuse, i.e. use as prophylaxis) in both human healthcare and agricultural settings (such as animal husbandry). There is a strong correlation between high levels of antibiotic use and antibiotic resistance.

- **Poor infection prevention** and infection control practices, which can increase the spread of drug-resistant infections. These include inadequate sanitation conditions, poor hand hygiene and inappropriate food handling (in the hospital, other healthcare facilities and at home).

- The **use of counterfeit, sub-standard** or **poor quality antibiotics**, often containing sub-optimal therapeutic doses that fail to fully eradicate bacteria.

- **Limited surveillance systems** to globally monitor antibiotic use and resistance.

Acute upper respiratory tract infections (URTIs) are one of the most common diseases seen within primary care, with symptoms including sore throat, blocked or runny nose, headache, cough and earache.

URTIs also account for a large proportion of antibiotic prescriptions, yet the majority of patients do not require antibiotics to recover. Antibiotics only modestly reduce severity or duration of symptoms, if at all.1–3

URTI incidence: a global burden

Adults: 2–5 colds per year

Children: 7–10 colds per year

7.2 billion people worldwide

Antibiotic use and the treatment of URTIs

Antibiotics are not recommended for the treatment of most URTIs because:

• URTIs are **self-limiting** and only symptomatic relief products are generally needed for the patient to feel better. Antibiotics only modestly shorten the duration or severity of URTI symptoms, if at all\(^1\,^2\)

• The majority of URTIs are **viral**, with up to 90% of sore throats caused by a virus. As antibiotics only target bacterial infections, they are not effective in most patients\(^2\,^3\,^4\)

• Antibiotics may do **more harm than good**; side effects include diarrhoea, skin rash and thrush\(^3\,^5\,^6\). For example, the incidence of antibiotic-associated diarrhoea can be up to 25%\(^7\)

• Antibiotic-resistant bacteria can remain in the body for **up to 12 months**\(^8\)

The vast majority of URTIs are caused by:  
- □ Bacteria  
- □ Viruses

Antibiotics are not recommended for most URTIs  
- □ True  
- □ False

Antibiotic-resistant bacteria can remain in the body for up to how many months?  
- □ 3  
- □ 6  
- □ 12

**References:**  
Primary care has an important role in ensuring appropriate antibiotic use in the community. Effective communication is required in order to give clear messages to the public on why antibiotics are not recommended for the majority of URTIs, and to educate people around appropriate antibiotic use.

There are many opportunities to speak to patients about appropriate URTI management, such as when a URTI is being diagnosed, during treatment decisions, at the point of dispensing and when advising on self-care.

Physicians, pharmacists and pharmacy assistants may all be involved in a patient dialogue on antibiotic stewardship throughout the patient journey.
When **diagnosing a URTI**, the following factors should be considered:

- **Patient history** (immunocompromised, chronic illness, age)
- **Symptoms** (duration and severity)
- **Red flags** (severe symptoms indicating immediate GP referral or antibiotic treatment)
- **Patient ideas, concerns and expectations**

**Effective communication** is an opportunity for primary care teams to engage patients in a dialogue, allowing patients to identify reasons for consulting and explain their symptoms. Understanding their expectations allows HCPs to directly address a patient’s concerns and provide the most appropriate advice.¹

For more information on effective communication and diagnosing URTIs go to **module 2** and **module 3** of this series.

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**References:**
Treatment decisions

Involving the patient in the decision-making process provides an ideal opportunity to engage patients in appropriate treatment of URTIs and to explain why antibiotics are only required on rare occasions as well as the potential impact of antibiotic resistance on public health.

Time should be taken to clearly explain the benefits and risks of each treatment option so that the patient can better understand why treatments are recommended and partake in an informed discussion about what products will best meet their needs (which will be symptomatic in the majority of cases).

Information on treatment from pharmacists is important to consumers, whether spoken, written, or a combination of both. A tailored approach is needed to ascertain preference so that appropriate information is provided. Consider providing a patient leaflet to reinforce advice and reassure them about their symptomatic treatment.

Dispensing antibiotics

A further opportunity to engage with the patient about appropriate treatment is during the dispensing and collection of antibiotics. This brief interaction can help ensure correct adherence and help to prevent antibiotic resistance. It is also an opportunity to offer products for symptomatic relief, as antibiotics only modestly reduce symptom severity or duration, if at all.\textsuperscript{1,2}

Patient advice should include:

- Complete the \textbf{full course} of antibiotics
- \textbf{Clarify dose} and number of doses per day
- Use the antibiotics for the \textit{current infection only} – do not store antibiotics to treat future infections
- Mention potential \textbf{side effects} of the drug
- Do not give any \textbf{unused tablets} to friends/family
- Offer \textbf{symptomatic relief} options

Clarify the expected symptom duration and highlight signs or symptoms that require further medical advice. Give recommendations on how to best treat symptoms, if appropriate.

See module 2 and module 3 for more information on symptom duration, red flags and high-risk groups.

Advising patients

Healthcare professionals should aim to provide the **optimum symptomatic relief** for patients with URTIs. Many different types of products are available to relieve symptoms and address patients’ individual preferences.¹

**Patients should be reassured** that treatment of symptoms will make them feel better quickly while the body recovers from the infection.² This aligns with patient expectations; a German survey of 1,076 people investigating general expectations, knowledge and attitudes concerning prescription of antibiotics showed that **44% of respondents expected symptomatic treatment** for cold symptoms (e.g. lozenges, pain reliever, cough medication), while only **7.7% expected antibiotics** for these symptoms.³

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**Question 1:** What is the correct definition of antibiotic resistance?

A. Antibiotic resistance develops when a bacterium evolves to withstand antibiotics
B. Antibiotic resistance is when an antibiotic develops resistance against the bacteria that causes URTIs
C. Antibiotic resistance is when a virus evolves to withstand treatment from antibiotics

**Question 2:** Which of these is NOT a driver of antibiotic resistance?

A. Poor infection control
B. Poor quality assurance in antibiotic manufacturing
C. Effective infection prevention practices

**Question 3:** Which opportunities are appropriate to engage in a patient discussion about the correct use of antibiotics in URTIs and antibiotic resistance?

A. At the point of diagnosis
B. When making a treatment decision
C. At the point of antibiotic dispensing
D. All of the above
Assessment answers

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