Module 2:
Diagnosing and defining appropriate antibiotic use in URTIs

Continuing professional development module from the Global Respiratory Infection Partnership
Learning objectives

- Understand signs and symptoms of an upper respiratory tract infection (URTI)
- Know when an antibiotic is appropriate for patients with a URTI
- Learn about the appropriate treatment options for a URTI and the benefits of personalised symptomatic relief
What is a URTI?

An upper respiratory tract infection (URTI) is an acute infection of the nose, sinuses, throat and/or ears; acute upper respiratory viral infections are the most common type of disease in humans. URTIs can include pharyngitis, sinusitis, common cold, otitis media and influenza. For the vast majority of patients the infection is mild-to-moderate in severity, self-limiting and complications are rare.

The manifestation, symptoms and severity of a URTI can vary between patients. Patients with a URTI can present with one or more symptoms, depending on the cause, duration and severity of the infection. Symptoms can include a runny or blocked nose, sore throat, cough, headache, sinus pressure or pain, earache, no energy and/or fever.

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What causes URTIs?

Viruses cause the majority of URTIs, with the remainder caused by bacteria. The symptoms of a bacterial or a viral URTI are similar (see table) and it is hard to differentiate between the two based on symptoms alone.

Scoring systems, such as Centor, have been developed to increase the likelihood of identifying a bacterial cause, but these are not 100% accurate. In addition, mucus colour should not solely be used to differentiate between a bacterial or viral infection (a common misperception).

However, distinguishing between bacterial and viral disease is not critical for most decisions on antibiotic use, as the majority of bacterial and viral infections can be cleared by a healthy immune system.

URTIs are difficult to prevent due to easy transmission and airborne pathway, through sneezing, coughing or nose blowing. However, practising good hand hygiene can help prevent the spread of URTIs.

<table>
<thead>
<tr>
<th>Sore throat</th>
<th>Bacterial infection</th>
<th>Viral infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swollen tonsils</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Swollen neck glands</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Discomfort when swallowing</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Soreness</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Tonsillar exudates</td>
<td>✓</td>
<td>✓ / ✘</td>
</tr>
<tr>
<td>Absence of cough</td>
<td>✓</td>
<td>✓ / ✘</td>
</tr>
<tr>
<td>Fever</td>
<td>✓</td>
<td>✓ / ✘</td>
</tr>
</tbody>
</table>

Are antibiotics effective for URTIs?

As antibiotics only affect bacteria, and the majority of URTIs are of viral origin, antibiotics are not recommended for the treatment of most URTIs.\(^1\) There are numerous trials reporting only very modest reductions in symptom duration or severity, if present at all, regardless of the infecting organism.\(^2\)

When considering if antibiotics are required, a risk vs. benefit decision-making process should be adopted. For healthy adults, the risks tend to greatly outweigh the benefits:

- There is only a modest reduction in symptoms and duration when patients are treated with antibiotics and most patients get better without them.\(^1\)\(^-\)\(^3\) One study of patients with sore throat observed that 90% of both treated and untreated patients were symptom-free within 7 days\(^3\)

- The effects of many antibiotics are not immediate. It takes time for antibiotics to reduce symptom severity in respiratory infections\(^4\)

- Patients may suffer from side effects\(^5\)\(^-\)\(^7\)

- Antibiotic use can increase antibiotic resistance, reducing their efficacy in the future\(^5\)\(^-\)\(^7\)


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URTI management: Meeting the patient’s needs

Patient views and expectations often influence doctors and, in some countries, pharmacists to prescribe antibiotics.\(^1\) However, antibiotics do not fulfill the patient’s needs:\(^1–6\)

- Getting better faster – many patients want to get back to normal as soon as possible
- Symptom relief – while the body fights the infection, effective symptomatic relief will help to reduce pain, discomfort and fever; antibiotics do not provide effective symptom relief
- Kill the source of infection – as most URTIs are viral and antibiotics target bacteria, antibiotics are not a suitable treatment option. In addition, the immune system is able to fight most infections on its own, bacterial or viral. Therefore, antibiotics are not needed

In the majority of cases, symptomatic relief products are an effective and appropriate way of meeting the patient’s needs.\(^3\)

When should antibiotics be considered: High-risk patients

Use the **exclusion vs. inclusion** principle – most patients with URTIs will not require an antibiotic (as the majority of URTIs are caused by viruses¹) unless specific inclusion criteria are present. For example, patients with very severe illness or patients considered high-risk, may need an antibiotic to prevent secondary complications. High-risk factors include:²

- The frail or elderly (>65 years)
- Babies and infants under 2 years of age or born prematurely
- Pregnant women
- Existing co-morbidities including, but not limited to, chronic lung disease, heart disease, kidney disorders, blood disorders, endocrine disorders, liver disorders, metabolic disorders or neurological conditions
- Immunocompromised
- Morbidly obese
- Specific populations (e.g. American Indians, Alaskan Natives)

**References:**  
2. CDC. People at high risk of developing flu-related complications. 2013. Link: [http://www.cdc.gov/flu/about/disease/high_risk.htm](http://www.cdc.gov/flu/about/disease/high_risk.htm)

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When to refer from the pharmacy to a general practitioner or physician: Red flags

Red flag signs, or serious alarm symptoms, may indicate a more serious illness and further medical help is required. This may include treatment with antibiotics. Red flags for URTIs are listed below:

- Shortness of breath
- Great difficulty swallowing
- Coughing up blood
- Neck swelling on one side, unrelated to lymph nodes
- Very high temperature or night sweats
- Drooling or muffled voice
- Wheezing sounds when breathing

The role of diagnostic tools: Sore throat example

Point-of-care testing is useful to help identify the cause of sore throat, particularly in high-risk groups. The Centor criteria are used widely to establish if the throat infection is the bacterial infection, group A Streptococcus.\(^1\) If Strep A is the cause, antibiotics may be prescribed as they could reduce illness duration and the risk of possible complications.\(^2\) The Centor criteria include the following, with 1 point given for each:\(^2\)

- Tonsillar exudate
- Swollen, tender anterior cervical nodes
- Absence of a cough
- History of fever

Additional criteria include age – add 1 point if under 14 years old and subtract 1 point if over 44 years old; this McIsaac Modified Centor score has been shown to reduce unnecessary antibiotic prescriptions by up to 88% in a study of 441 adult patients, comparing physician judgement against the Centor score recommendation.\(^2\)

The role of diagnostic tools: Sore throat example (continued)

Note: **Centor criteria identifies the risk of Strep throat only.** It doesn’t identify other bacterial causes of sore throat.

Assessing patients with a physical examination and identifying Centor variables has value above the actual Centor score. Patients feel reassured following a thorough examination of the throat and neck. Further reassurance that the infection is not serious is one of the primary reasons patients consult their physician with sore throat.³

What is the role of symptomatic relief?

All symptoms of URTIs can be addressed by a selection of symptomatic relief products. Different active agents and formulations offer a range of benefits, so treatment can be tailored to individual patients.¹ Efficacy is important and the speed and duration of action can vary between products. Formulation and dose format may also have a role in patients’ treatment decisions and experience.¹

Multiple actives may be required for the treatment of differing symptoms.

Efficacy of symptomatic treatment is high:

- One study (n=80) showed treatment with a single dose NSAID (ibuprofen) was up to 80% more effective than placebo for patients with acute sore throat at 4 hours²
- Patients receiving a flurbiprofen 8.75 mg lozenge had a significantly reduced pain score at 26 minutes (n=102), when compared to the placebo group (n=102)³
- A statistically significant reduction in the daily major symptoms score was observed at 2 weeks for patients treated for rhinitis with fluticasone furoate nasal spray (once daily n=240, twice daily n=252) compared to placebo (n=245)⁴

Symptomatic relief options: Sore throat example

All symptoms of URTIs can be addressed by a selection of symptomatic relief products. For sore throat, as well as relieving pain, products can differ in their speed of onset\(^1\) (i.e. products with local delivery are faster acting than systemic treatments and may also provide sensorial benefits like demulcency), duration, mode of action, delivery method and product-related side effects.

**Fill in the gaps within the table below:**

<table>
<thead>
<tr>
<th>Formulation</th>
<th>Local delivery</th>
<th>Anti-inflammatory</th>
<th>Demulcent effect</th>
<th>Low dose, reduced side effect risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral NSAIDs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other analgesics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local NSAID lozenge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local NSAID spray/gargle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antiseptic/anaesthetic lozenge</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antiseptic/anaesthetic/spray/gargle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sore throat case study**

The patient is a 32-year-old man who presents with a sore throat. The patient complains of pain when swallowing, a high temperature/fever and tender lymph nodes in the neck. The symptoms have lasted for 3 days. The patient is otherwise fit and healthy with no cough or tonsillar exudates.

**Consider whether or not the patient needs an antibiotic.**

The patient has an inflamed sore throat with a Centor score of 3, this indicates a possible Group A Streptococcal (bacterial) infection. As the patient is not high-risk and no red flags are present, antibiotics are not required – even if bacteria are causing the infection.

Recommend an anti-inflammatory lozenge to ease the pain when swallowing. These act at the site of pain and provide fast, effective relief. In addition, the lozenge format provides a demulcent effect. An antipyretic may also be required to reduce fever.
Common cold case study

The patient is a 65-year-old lady who consults with a blocked nose, forehead pressure, headache, cough and malaise. Symptoms have lasted for 5 days.

Consider whether antibiotics are required?

This patient has a common cold with sinusitis, which can last for up to 14 days, but individual symptoms should start to improve after a week. This patient is on the borderline of a high-risk age group but has no other risk factors. Therefore, an antibiotic is not required at this stage but advice should be given about warning signs/symptoms and to come back if symptoms persist or worsen.

Recommend symptomatic treatment relief; for example, an analgesic, decongestant, antitussive and/or expectorant. This should be aligned with patient preferences and target the most bothersome symptoms. The patient should also be advised to rest, avoiding strenuous activity.

If this lady re-consults with no improvements to symptoms after 3 or 4 days, an antibiotic may be required due to her age and duration of symptoms.
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**Question 1**: Which of these definitions describes a URTI?

A. Infection of the main airway and lungs  
B. Infection of the urinary tract  
C. Infection of the sinuses, nose, throat and/or ears

**Question 2**: In which of these scenarios should an antibiotic be considered?

A. 6 year old with runny nose and cough for 2 days – otherwise fit and healthy  
B. 75 year old with diabetes, experiencing flu-like symptoms for 10 days  
C. 35 year old lady with sinus pain and blocked nose for 5 days. No cough or fever.

**Question 3**: Which of these symptoms is a red flag?

A. Difficulty breathing  
B. Earache  
C. Blocked nose
**Assessment answers**

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