

A woman with long, dark hair, wearing a white collared shirt, is shown from the chest up. She has her eyes closed and a pained expression, with her hands clasped over her throat, suggesting she has a sore throat or is experiencing difficulty swallowing. The background is a bright, out-of-focus indoor setting. A large red curved shape is overlaid on the right side of the image, containing the main title and other text.

# RESPONSIBLE MANAGEMENT OF UPPER RESPIRATORY TRACT INFECTIONS (URTIs) IN PHARMACY

GRIP guidance

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# OVERUSE AND MISUSE OF ANTIBIOTICS DRIVE ANTIBIOTIC RESISTANCE<sup>1</sup>

- Antibiotic resistance occurs when bacteria resist the effects of antibiotics, making common infections harder to treat and increasing the risk of disease spread, severe illness and death<sup>1-4</sup>
- The majority of URTIs are viral, and antibiotics do not work against viruses<sup>1,5-11</sup>
- Responsible, symptomatic management of URTIs has huge potential to prevent unnecessary antibiotic use and thereby limit antibiotic resistance

## RESPONSIBLE MANAGEMENT OF ACUTE URTIs IN THE PHARMACY

Would the patient benefit from antibiotics?

Should the patient see a doctor?



Is the patient aware of the issue of antibiotic resistance?

What symptomatic approach would most benefit the patient?

**“Antimicrobial resistance threatens the very core of modern medicine”<sup>1</sup>**

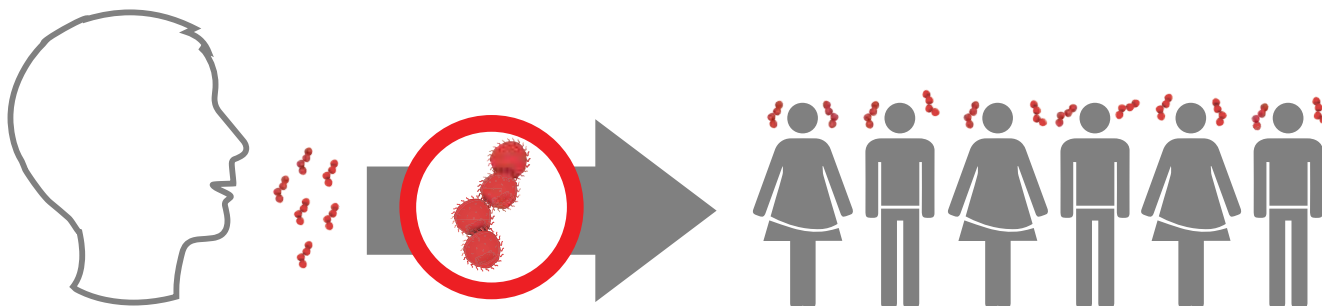
**In a study of outpatient visits, 80% of antibiotics given for acute URTIs were found to be unnecessary<sup>9</sup>**

1. World Health Organization. Global action plan on antimicrobial resistance, 2015. Available at: <https://www.who.int/publications/i/item/9789241509763> (accessed September 2023); 2. Munita JM, Arias CA. Microbiol Spectr 2016;4; 3. Leekha S, et al. Mayo Clin Proc 2011;86:156-67; 4. Zaman SB, et al. Cureus 2017;9:e1403; 5. Hildreth CJ, et al. JAMA 2009;302:816; 6. Ebell MH, et al. JAMA 2000;284:2912-8; 7. Van Gageldonk-Lafeber AB, et al. Clin Infect Dis 2005;41:490-7; 8. Kenealy T, Arroll B. Cochrane Database Syst Rev 2013;6:CD000247; 9. Scott JG, et al. J Fam Pract 2001;50:853-8; 10. Baron S. Medical Microbiology 4th edition. Chapter 93. Infections of the respiratory system. 1996. University of Texas Medical Branch at Galveston, Galveston, Texas; 11. Creer DD, et al. Thorax 2006;61:75-9.

# ANTIBIOTIC RESISTANCE AFFECTS EVERYONE, TODAY

- Antibiotic misuse reduces their potential to cure bacterial infections<sup>1-5</sup>
- Antibiotic-resistant bacteria can stay in the body for up to 1 year<sup>6</sup>

**PEOPLE CAN CARRY RESISTANT BACTERIA AND SPREAD THEM TO OTHERS IN THEIR COMMUNITY<sup>5</sup>**



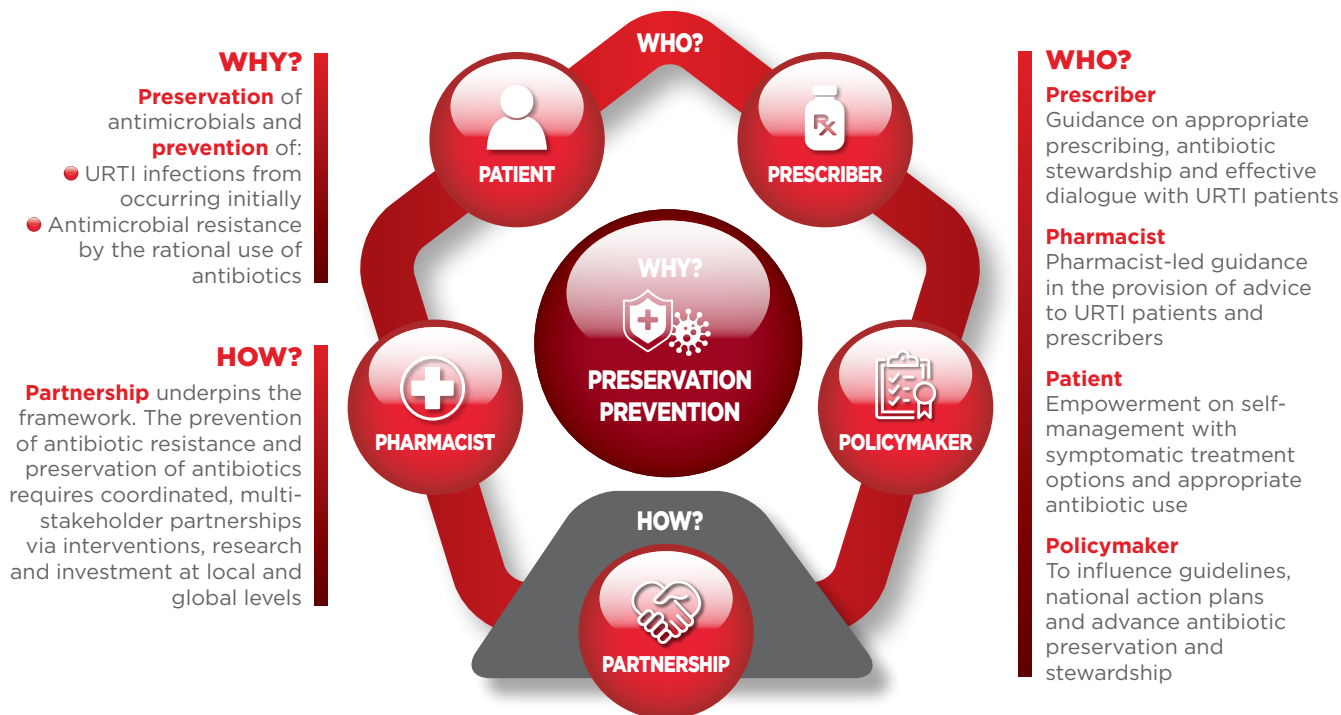
**We could find ourselves in a world where common infections could once again kill, as antibiotics will no longer work effectively<sup>1,2</sup>**

1. World Health Organization. Global action plan on antimicrobial resistance, 2015. Available at: <https://www.who.int/publications/i/item/9789241509763> (accessed September 2023); 2. Zaman SB, et al. Cureus 2017;9:e1403; 3. Goossens H, et al. Lancet 2005;365:579-87; 4. Riedel S, et al. Eur J Clin Microbiol Infect Dis 2007;26:485-90; 5. World Health Organization. Antimicrobial resistance. Fact sheet, 2018. Available at: <http://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance> (accessed September 2023); 6. Costelloe C, et al. BMJ 2010;340:c2096.

# HOW CAN GRIP HELP?

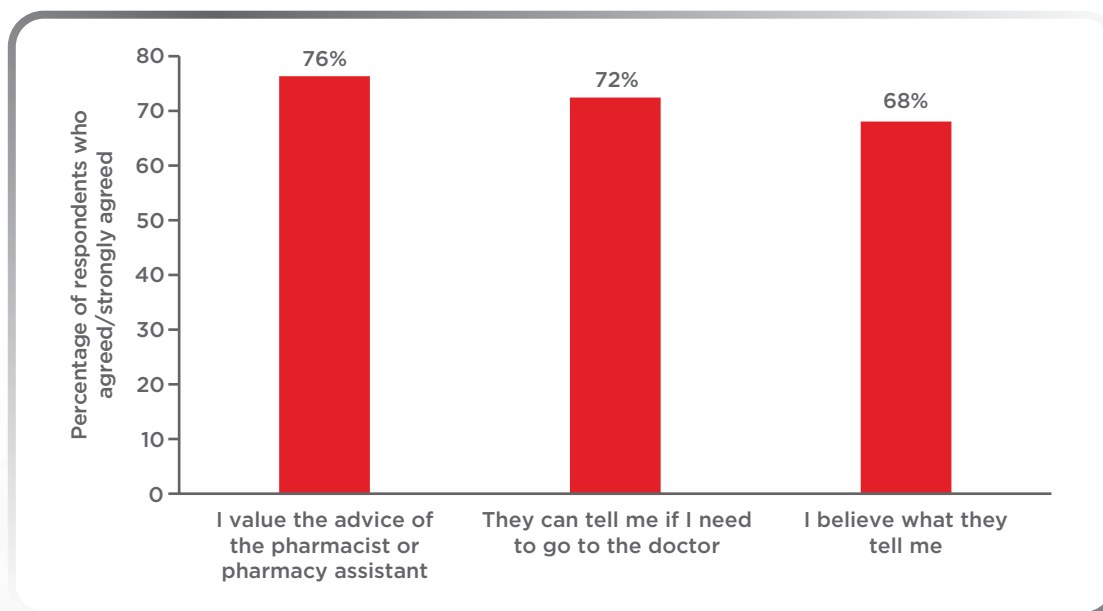
- The Global Respiratory Infection Partnership (GRIP) is a group of healthcare professionals from around the world, consisting of primary care and hospital doctors, microbiologists, pharmacists and researchers
- GRIP has developed a framework and educational support materials for symptomatic management of URTIs<sup>1</sup>
- The World Health Organization warns that “steps need to be taken **immediately** in order to raise awareness of antimicrobial resistance and **promote behavioural change**”<sup>2</sup>
- Promoting behaviour change is at the core of GRIP’s mission, based on a pentagonal (5-P) framework which encompasses policy, prevention, prescriber, pharmacy and patient<sup>3</sup>

## THE GRIP 5-P FRAMEWORK FOR CHANGE<sup>3</sup>



# THE PHARMACY TEAM IS CRITICAL FOR ANTIBIOTIC STEWARDSHIP

- The pharmacy team has a **key role** to play in antibiotic stewardship<sup>1,2</sup>
- Community pharmacists are amongst the most accessible of healthcare providers. Pharmacies are often the first place patients go to for advice on common health complaints and the last point of contact before antibiotic treatment commences<sup>2</sup>
- A survey across 13 countries (n=5196) showed that **people trust pharmacists** to give sound and appropriate advice about sore throat<sup>3</sup>



- URTIs are among the most commonly treated acute problems in primary care<sup>4</sup>
- GRIP has developed a simple **1,2,3-step approach** for use in the pharmacy setting that aids responsible management of URTIs, including sore throat



# RESPONSIBLE URTI MANAGEMENT – WHAT PATIENTS NEED TO KNOW

Encouraging symptomatic relief of URTIs

# WHAT IS A URTI?

- Respiratory tract infections are classified as upper or lower, based on the area of the respiratory tract that is affected.<sup>1</sup> **URTIs** are those affecting the nasal cavities/sinuses, pharynx, epiglottis, larynx and upper airways<sup>1</sup>

## URTIs CAUSE INFLAMMATION THROUGHOUT THE UPPER RESPIRATORY TRACT, RESULTING IN THE FOLLOWING SYMPTOMS<sup>1,2</sup>

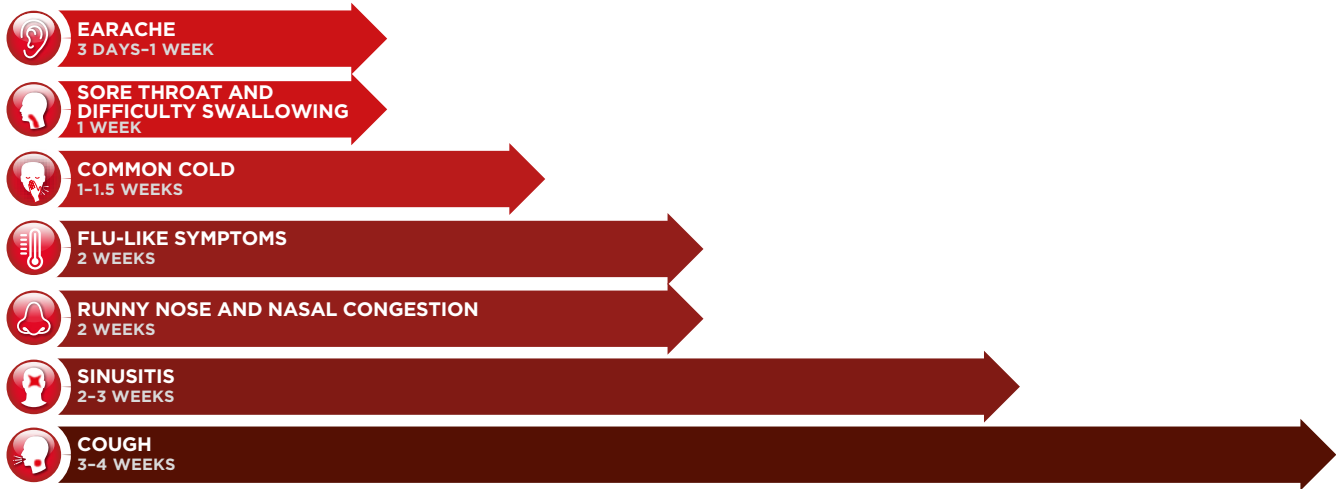


- The **manifestation, symptoms and severity of a URTI can vary between patients.** Patients with a URTI can present with one or more symptoms, depending on the cause, duration and severity of the infection<sup>3</sup>

# MOST URTIs ARE NON-SERIOUS AND SELF-LIMITING

- URTIs are among the most commonly treated acute problems in primary care<sup>1</sup>
- Most URTIs are non-serious, self-limiting<sup>2,3</sup> and **resolve without antibiotics** in 1–4 weeks<sup>4–12</sup>
- Despite this, **antibiotics are often provided** for URTIs<sup>13–15</sup> but **may do more harm than good** in most patients<sup>4,16</sup>

## UPPER RESPIRATORY TRACT INFECTION IS SELF-LIMITING,<sup>2,3</sup> SHORT-LIVED, AND THE DURATION OF EACH SYMPTOM FROM ITS FIRST OCCURRENCE VARIES<sup>4–12</sup>



In the majority of cases, symptomatic relief products are an effective and appropriate way of meeting the patient's needs<sup>17</sup>

1. Francis NA, et al. BMJ 2009;339:b2885; 2. Baron S. Medical Microbiology 4th edition. Chapter 93. Infections of the respiratory system. 1996. University of Texas Medical Branch at Galveston, Galveston, Texas; 3. Kenealy T, Arroll B. Cochrane Database Syst Rev 2013;6:CD000247; 4. National Institute for Health and Care Excellence. Sore throat (acute): antimicrobial prescribing. Clinical guideline 84. January 2018. Available at: <https://www.nice.org.uk/guidance/ng84> (accessed September 2023); 5. National Institute for Health and Care Excellence. Otitis media (acute): antimicrobial prescribing. Clinical guideline 91. March 2018. Available at: <https://www.nice.org.uk/guidance/ng91> (accessed September 2023); 6. National Institute for Health and Care Excellence. Sinusitis (acute): antimicrobial prescribing. Clinical guideline 79. October 2017. Available at: <https://www.nice.org.uk/guidance/ng79> (accessed September 2023); 7. National Institute for Health and Care Excellence. Cough (acute): antimicrobial prescribing. Clinical guideline 79. October 2017. Available at: <https://www.nice.org.uk/guidance/ng120> (accessed September 2023); 8. Spinks A, et al. Cochrane Database Syst Rev 2013;11:CD000023; 9. Macy E. Perm J 2012;16:61-6; 10. Centers for Disease Control and Prevention. Flu symptoms and complications. 2018. Available at: <https://www.cdc.gov/flu/symptoms/symptoms.htm> (accessed September 2023); 11. Gwaltney JM, et al. JAMA 1967;202:494-500; 12. Arruda E, et al. J Clin Microbiol 1997;35:2864-8; 13. Scott JG, et al. J Fam Pract 2001;50:853-8; 14. Dekker AR, et al. Fam Pract 2015;32:401-7; 15. Gulliford MC, et al. BMJ Open 2014;4:e006245; 16. Wright J, Paauw DS. Med Clin North Am 2013;97:667-79; 17. Thomas M, et al. Br J Gen Pract 2000;50:817-20.



# RELIEF OF URTI SYMPTOMS

● A URTI is often a multi-symptom condition, and relief of specific, individual symptoms can be tailored to the patient's preferences

URTI symptom	Examples of active ingredients	Local formulation	Systemic formulation	Mode of action
Earache	Local anaesthetic (e.g. topical lidocaine)	✓	✗	Anaesthetic mode of action. Uptake of the local anaesthetic is increased when the tympanic membrane is inflamed <sup>1</sup>
Sore throat and difficulty swallowing	Local antiseptic or anaesthetic (e.g. amylmetacresol, 2,4-dichlorobenzyl alcohol, hexylresorcinol, lidocaine)	✓	✗	Amylmetacresol and 2,4-dichlorobenzyl alcohol have an antiseptic mode of action to fight bacteria and viruses <sup>2-4</sup> Lidocaine has an anaesthetic mode of action that numbs the throat <sup>5</sup> Hexylresorcinol numbs the throat and has antiseptic properties <sup>2,5</sup>
	Non-steroidal anti-inflammatory drugs (e.g. flurbiprofen)	✓	✗	Flurbiprofen reduces pain and inflammation by inhibiting the production of prostaglandins <sup>6</sup>
	Non-steroidal anti-inflammatory drugs (e.g. ibuprofen) Paracetamol	✗	✓	Ibuprofen inhibits prostaglandin production to reduce inflammation and relieve pain and fever <sup>7,8</sup> Paracetamol relieves pain <sup>9</sup> and fever <sup>8,9</sup> but has only low-level anti-inflammatory action <sup>9</sup>
Cold and flu-like symptoms (e.g. headache, muscle aches, fever)	Non-steroidal anti-inflammatory drugs (e.g. ibuprofen) Paracetamol	✗	✓	
Runny nose and nasal congestion	Antihistamines (e.g. diphenhydramine) Decongestants (e.g. pseudoephedrine, oxymetazoline, xylometazoline) Anti-cholinergics (e.g. ipratropium)	✓	✓	Antihistamines reduce histamine-related nasal mucosal swelling and secretion <sup>10</sup> Decongestants constrict swollen nasal blood vessels <sup>10,11</sup> Anti-cholinergics reduce the amount of mucus produced in the nose <sup>12,13</sup>
	Sinusitis	Decongestants (e.g. pseudoephedrine)	✓	✓
Cough	Menthol	✓	✗	Suppresses the cough reflex <sup>14,15</sup>
	Cough suppressants (e.g. dextromethorphan) Sedative antihistamines (e.g. diphenhydramine)	✗	✓	

1. Bolt P, et al. Arch Dis Child 2008;93:40-4; 2. Shephard A, Zybesari S. Antiviral Res 2015;123:158-623; 3. Oxford JS, et al. Antivir Chem Chemother 2005;16:129-34; 4. Richards RM, Xing DK. J Pharm Sci 1993;82:1218-20; 5. McNally D, et al. J Pharm Pharm Sci. 2012;15:281-94; 6. Buchanan W, Kassam A. Am J Med 1986;80:145-526; 7. Burian M, Geisselinger G. Pharmacol Ther 2005;107:139-54; 8. Rainsford KD. Inflammopharmacology 2009;17:275-342; 9. Graham GG, et al. Inflammopharmacology 2013;21:201-32; 10. Meltzer EO, et al. Int J Gen Med 2010;3:69-91; 11. Taverner D, Latte GJ. Cochrane Database Syst Rev 2007;1:CD001953; 12. Eccles R, et al. Curr Med Res Opin 2010;26:889-99; 13. AlBalawi ZH, et al. Cochrane Database Syst Rev 2013;6:CD008231; 14. Morice AH, et al. Thorax 2006;61(Suppl 1):i1-24; 15. Dicipinigitis PV, et al. Cough 2009;5:11.



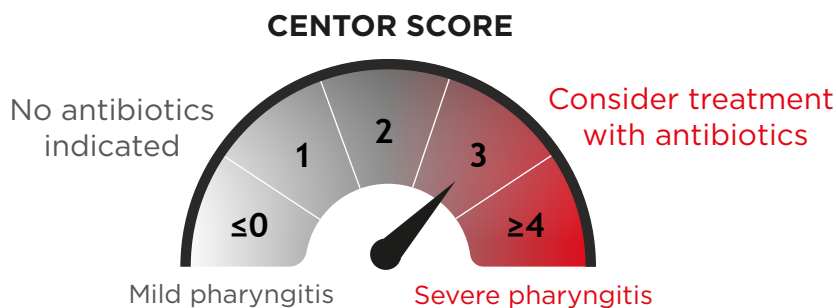
# ACE MODEL FOR SORE THROAT MANAGEMENT IN PHARMACY

Encouraging symptomatic relief of URTIs

# SORE THROAT

- Up to **8 out of 10 sore throats are caused by viral URTIs** (such as the common cold or flu),<sup>1</sup> against which antibiotics do not work<sup>2</sup>
- Sore throat is usually self-limiting and resolves within 1 week<sup>3,4</sup>
- Group A  $\beta$ -haemolytic Streptococcus is associated with about 10% of adult sore throats and up to 30% in children.<sup>5</sup> In such cases, antibiotic therapy may be justified to prevent complications and/or shorten illness duration<sup>6</sup>
- However, it is difficult to distinguish between a viral or bacterial infection **based on signs and symptoms**<sup>7</sup>
  - There is **no evidence** for using the colour of nasal discharge or phlegm as a marker for the disease aetiology<sup>8</sup>
  - The Centor criteria may help to identify patients with streptococcal infection<sup>9-11</sup>
  - Antibiotics may be considered for patients with three or more Centor criteria<sup>9</sup>

## THE CENTOR CRITERIA CAN HELP TO IDENTIFY PATIENTS IN WHICH ANTIBIOTICS MAY BE CONSIDERED<sup>9-11</sup>



CRITERIA	POINTS
Absence of cough	1
Swollen and tender anterior cervical nodes	1
Temperature >38°C	1
Tonsillar exudates or swelling	1
Age	
3-14 years	1
15-44 years	0
45 years and older	-1
Cumulative score	—

1. Ebell MH, et al. JAMA 2000;284:2912-8; 2. Hildreth CJ, et al. JAMA 2009;302:816; 3. National Institute for Health and Care Excellence. Sore throat (acute): antimicrobial prescribing. Clinical guideline 84. January 2018. Available at: <https://www.nice.org.uk/guidance/ng84> (accessed September 2023); 4. Spinks A, et al. Cochrane Database Syst Rev 2013;11:CD000023; 5. Bisno AL. N Engl J Med 2001;344:205-11; 6. Pelucchi C, et al. Clin Microbiol Infect 2012 Apr;18 Suppl 1:1-28; 7. Aalbers J, et al. BMC Med 2011;9:67; 8. Eccles R. Lancet Infect Dis 2005;5:718-25; 9. Centor RM, Samlowski R. Am Fam Physician 2011;83:26-8; 10. Centor RM, et al. Med Decis Making 1981;1:239-46; 11. McIsaac WJ, et al. JAMA 2004;291:1587-95.

# ANTIBIOTICS ARE NOT INDICATED FOR SORE THROAT PAIN

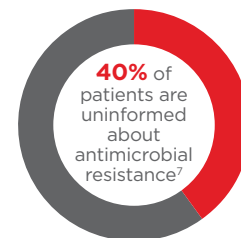
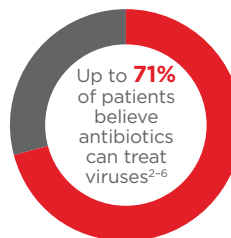
- A key feature of sore throat is **inflammation**<sup>1,2</sup> resulting in throat pain that patients describe using a variety of sensory, affective and functional descriptors (e.g. dry, agonising, difficult to swallow)<sup>3</sup>
- Antibiotics do not target the inflammation underlying sore throat and are not direct pain relievers
- Antibiotics have minimal effects on the symptoms of sore throat<sup>4,5</sup>
  - A study in patients with streptococcal infection receiving the flurbiprofen lozenge showed that additional antibiotic treatment made no difference to symptoms of pain<sup>5</sup>
- Studies show that patients with sore throat are looking for pain relief<sup>6,7</sup>



**21** patients with sore throat need to be treated with antibiotics for **1** patient to benefit from this treatment after 7 days<sup>4</sup>

# ACE MODEL FOR SORE THROAT

- Overuse and misuse of antibiotics significantly contribute to antimicrobial resistance<sup>1</sup>
- Many patients have a misunderstanding of the mechanism of action and bacterial targets of antibiotics, which may contribute to inappropriate antibiotic use<sup>2-6</sup>
- It has also been shown that patients are uninformed about antimicrobial resistance<sup>7</sup>
- Targeted strategies can be employed within the pharmacy to dispel patient misconceptions and encourage symptomatic management of sore throat, which would help to mitigate antimicrobial resistance
  - Before addressing misconceptions, it is important to eliminate a bacterial throat infection, which can lead to complications in higher risk patients. Step 2 of the **1,2,3-step approach** can be implemented as a safeguarding step

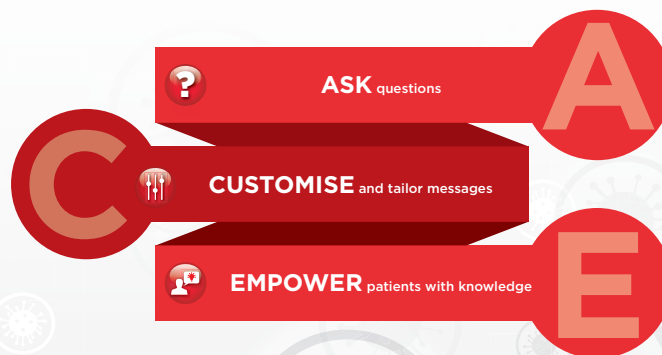


## 1,2,3 APPROACH FOR SORE THROAT



## ACE MODEL FOR ENGAGEMENT

- Once it has been confirmed that self-management is appropriate (viral infection), GRIP recommends the **ACE model for engagement** to address misconceptions and empower the patient to make appropriate health decisions



1. World Health Organization. Antimicrobial resistance: key facts. 2021. Available at: <https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance> (accessed August 2023); 2. World Health Organization. Antibiotic resistance: multi-country public awareness survey. 2015. Available at: [https://apps.who.int/iris/bitstream/handle/10665/194460/9789241509817\\_eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/194460/9789241509817_eng.pdf) (accessed August 2023); 3. Cals JW, et al. Br J Gen Pract 2007;57: 942-7; 4. Widayati A, et al. Antimicrob Resist Infect Control 2012;1:38; 5. Gaarslev C, et al. Antimicrob Resist Infect Control 2016;5:39; 6. Davis ME, et al. Antibiotics 2017;6:23; 7. Altiner A, et al. Understanding attitudes and perceptions of consumers in relation to antibiotic use for respiratory illnesses and symptoms in Europe. Presented at 33<sup>rd</sup> European Congress of Clinical Microbiology & Infectious Diseases (P2298), Copenhagen, Denmark, 15-18 April 2023.

# **A** ASK QUESTIONS

- Ask the patient questions and carefully listen to their answers to understand the root of the problem and establish trust
- Recognise that URTIs can be worrying and uncomfortable for patients



Their main symptom(s)

What they are concerned about

What they are looking for in a treatment option

What they understand about antimicrobial resistance

- Asking questions will help to identify patients' needs and any misconceptions related to antibiotic strength and understand how much knowledge the patient has in relation to antimicrobial resistance



## **COMMON MISCONCEPTIONS RELATED TO ANTIBIOTICS**

'Antibiotics will help me to get better more quickly'

'Antibiotics are strong medications that are more effective at treating my sore throat (regardless of whether it is viral or bacterial)'



## **COMMON MISCONCEPTIONS RELATED TO ANTIMICROBIAL RESISTANCE**

'If I take too many antibiotics, or don't take them properly, I will catch antimicrobial resistance, or I will personally become resistant to antibiotics'

'I have never used antibiotics, so I can't have resistant infections'



# CUSTOMISE AND TAILOR MESSAGES

- Utilise different materials to deliver customised messages that are simple yet evidence driven, and explain the notion of appropriate antibiotic use and antimicrobial resistance



**PATIENT  
DECISION  
AIDS**



**SHORT  
VIDEOS**



**EASY-TO-READ  
MATERIALS**



## **KEY MESSAGES TO CONVEY TO PATIENTS FOR MISCONCEPTIONS RELATED TO...**

### **ANTIBIOTICS**

- Antibiotics are ineffective against URTIs of a viral aetiology<sup>1</sup>
- Antibiotics do not target the inflammation underlying sore throat and do not have direct pain-relieving effects
- Antibiotics can cause side effects<sup>2</sup>
- If antibiotics are necessary, they should be taken in accordance with the recommendation from the patient's doctor

### **ANTIMICROBIAL RESISTANCE**

- Misuse of antibiotics can generate resistant bacteria, which can stay in the body for the next year<sup>3,4</sup>
- Resistant bacteria can be spread between people<sup>4</sup>
- Antimicrobial resistance can make bacterial infections harder to treat and can lead to severe illness and an increased risk of complications, hospital admissions and mortality<sup>4,5</sup>
- Antimicrobial resistance makes it difficult to prevent patients getting infections during major surgery<sup>4</sup>

# **E** EMPOWER PATIENTS WITH KNOWLEDGE

- Empower patients with the knowledge needed to understand the cause of their illness and why evidence-based symptomatic relief can be effective for URTIs by using different materials



**PATIENT  
DECISION  
AIDS**



**SHORT  
VIDEOS**



**EASY-TO-READ  
MATERIALS**



## **KEY MESSAGES TO CONVEY TO ENCOURAGE RESPONSIBLE, SYMPTOMATIC MANAGEMENT OF SORE THROAT**



### **EDUCATE ON SORE THROAT**

- Most sore throats are caused by viral URTIs (up to 8 out of 10), such as the common cold or flu<sup>1</sup>
- Sore throat is normally non-serious and self-limiting<sup>2</sup>
- A key feature of sore throat is inflammation resulting in throat pain; this can be managed with symptomatic treatment options



### **RECOMMEND ALTERNATIVES TO ANTIBIOTICS THAT OFFER RELIEF FROM THE SYMPTOMS OF SORE THROAT**

- Discuss the different products that are available that can be used to relieve symptoms of sore throat



Solubles



Drops



Syrups



Gargles



Lozenges



Tablets



Sprays



### **INFORM THE PATIENT ABOUT WHAT TO DO NEXT**

- Sore throat usually resolves within approximately 1 week<sup>2</sup>
- If symptoms worsen rapidly or significantly or do not improve after 1 week, advise the patient to visit the doctor<sup>2</sup>



# PRODUCTS THAT PROVIDE EFFECTIVE, RAPID SYMPTOMATIC TREATMENT FOR THE PAIN AND INFLAMMATION OF SORE THROAT

- To relieve sore throat, treatments should:
  - Target the underlying inflammation,<sup>1</sup> which is induced by viruses or bacteria<sup>2</sup>
  - Provide evidence-based relief of the painful symptoms of sore throat,<sup>1</sup> which can be mild or severe<sup>3</sup>
  - Provide rapid onset and prolonged duration of action<sup>1</sup>

Formulation	Action and effect					Notes
	Local delivery to throat	Relieves pain	Coats and moistens the throat	Anti-inflammatory action	Low dose, so there is a low risk of side effects	
Anti-inflammatory lozenge or spray (e.g. flurbiprofen)	✓	✓ <sup>4-10</sup>	✓ <sup>7</sup>	✓ <sup>9</sup>	✓ <sup>4-7</sup>	Local anti-inflammatory <sup>11</sup> and pain-relieving <sup>4-10</sup> action in the throat
Antiseptic/anaesthetic lozenge (e.g. amylmetacresol, 2,4-dichlorobenzyl alcohol, hexylresorcinol, lidocaine)	✓	✓ <sup>12-15</sup>	✓	✗	✓ <sup>12</sup>	Lozenge dissolves slowly to release active ingredients <sup>1</sup> for pain relief <sup>12-15</sup>
Oral anti-inflammatory tablet (e.g. ibuprofen)	✗	✓ <sup>16-18</sup>	✗	✓ <sup>17</sup>	✗	Anti-inflammatory action <sup>17</sup> throughout the body. Slower acting <sup>18</sup> than local treatments <sup>7,9</sup>
Oral analgesic tablet (e.g. paracetamol)	✗	✓ <sup>19</sup>	✗	✗	✗	Only low level anti-inflammatory activity <sup>19</sup>

- A local anti-inflammatory drug such as flurbiprofen, delivered as a lozenge or spray, can rapidly<sup>7,9</sup> relieve sore throat pain, difficulty swallowing, swollen throat<sup>7,10</sup> and other symptoms of throat discomfort,<sup>20</sup> with pain relief that lasts for up to 4–6 hours<sup>7,10,21</sup>

1. Oxford JS, Leuwer M. J Clin Pract 2011;65:524–30; 2. Ebell MH, et al. JAMA 2000;284:2912–8; 3. Shephard A. J Family Med Community Health 2014;1:1014; 4. Blagden M, et al. Int J Clin Pract 2002;56:95–100; 5. Watson N, et al. Int J Clin Pract 2000;54:490–6; 6. Benrimoj S, et al. Clin Drug Invest 2001;21:183–93; 7. Schachtel B, et al. Pain 2014;155:422–8; 8. Schachtel B, et al. Pain Pract 2016;16:6–176 [abstract]; 9. Bychkova V, et al. Int J Clin Pharm 2017;39:208–341 [abstract]; 10. de Looze F, et al. Eur J Gen Pract 2016;22:111–8; 11. Lambkin-Williams R, et al. SAGE Open Med 2020;8:2050312120960568; 12. Wade AG, et al. BMC Family Practice 2011;12:6; 13. Buchholz V, et al. Naunyn Schmiedebergs Arch Pharmacol 2009;380:161–8; 14. McNally D, et al. Int J Clin Pract 2010;64:194–207; 15. McNally D, et al. J Pharm Pharm Sci 2012;15:281–94; 16. Burian M, Geisselinger G. Pharmacol Ther 2005;107:139–54; 17. Rainsford KD. Inflammopharmacology 2009;17:275–342; 18. Schachtel BP, et al. Clin Pharmacol Ther 1994;55:464–70; 19. Graham GG, et al. Inflammopharmacology 2013;21:201–32; 20. Schachtel B, et al. Pain Manag 2018;8:85–94; 21. Schachtel B, et al. Pain Pract 2016;16:6–176 [abstract].

# ACE MODEL FOR ENGAGEMENT



**ASK** questions to understand how much antimicrobial resistance knowledge the patient has and identify misconceptions they may have

# A

# C



**CUSTOMISE** your messages to address patients' concerns using simple yet evidence-driven messages



**EMPOWER** patients with the knowledge needed to understand the cause of their illness and why evidence-based symptomatic relief can be effective for URTIs

# E

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The Global Respiratory Infection Partnership (GRIP) is an international group of healthcare professionals committed to reducing inappropriate antibiotic use for respiratory tract infections in primary care and the wider community, helping to counteract antibiotic resistance.

