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Evidence-to-Recommendation Framework for 2026 ACE Clinical Guideline on upper respiratory tract infections — rational antimicrobial use

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Abstract

The Evidence-to-Recommendation (EtR) framework underpins the ACE Clinical Guideline for rational antimicrobial use in upper respiratory tract infections (URTIs). URTIs are one of the most frequent presentations in primary healthcare settings, and they offer a critical opportunity for clinicians to promote antimicrobial stewardship through evidence-based prescribing practices. Utilising GRADE methodology, four evidence-informed recommendations have been formulated to support clinicians in assessing URTIs and making appropriate antimicrobial treatment decisions. The EtR framework synthesises the available evidence base alongside expert consensus to inform the recommendations presented in the ACG, thereby enabling clinicians to better understand the underlying rationale and effectively implement these recommendations within their clinical practice when managing URTIs and considering antimicrobial therapy.

Introduction

The topic of upper respiratory tract infections (URTIs) was proposed in the 2023 ACE Clinical Guideline (ACG) topic call to address the absence of national guidelines and the variations in URTI management across local care settings, particularly pertaining to antimicrobial use.

URTI is one of the most common reasons for consultations in the primary care setting; from 2022 to 2024, URTI was the fourth leading condition for polyclinic attendances. In 2024 alone, URTI-related polyclinic visits accounted for 9.6% of all polyclinic diagnoses.[1] This presents an opportunity for clinicians to steward antimicrobial use through judicious prescribing and patient education.

Against the context of the frequent presentation of URTI, it is also a major contributor to antibiotics over-prescription.[2,3] While this issue is well recognised by most (82.7%) primary care practitioners (PCPs),[2] there is still significant variation in antimicrobial prescribing practices amongst those in private and public practice. In a local survey, less than 40% of surveyed private PCPs considered themselves low antibiotic prescribers (i.e. prescribing antibiotics for <20% of patients with URTI), in contrast to 80% among PCPs practising in public polyclinics.[2] This difference may be due to clinician (e.g. knowledge and practice habits)[2] and/or organisational factors (e.g. operational models, drug formulary, financing models, and related organisational values).[4]

Additionally, the use of antibiotics for respiratory infections has increased post COVID-19, with a concerning level of use of the World Health Organization's AWaRe 'Watch' category antibiotics (fluroquinolones, macrolides) from 2018-2023, with a Compound Annual Growth Rate of 2% for macrolide use (MOH internal data [unpublished]) Interviews with domain experts (n =2) and in-depth interviews of PCPs (n = 8) identified the following key barriers to appropriate antimicrobial prescribing [MOH data, unpublished]: heavy reliance on clinical

judgement, limited access to rapid diagnostic tools, fear of missing bacterial infections and potential complications, and patient expectations.

This ACG on rational antimicrobial use in URTI supports clinicians in their clinical assessment of URTIs and in making informed treatment decisions on antimicrobials for URTIs.

Methods

This guideline was developed based on the ACE methods and processes for ACG development, and followed a hybrid de-novo/adaptation process.[5] A systematic search for international guidelines was conducted across databases including Guideline Central, GIN Library, ECRI Guidelines Trust, PubMed, Epistemonikos, and Trip Medical Databases, supplemented by manual retrieval from relevant specialty associations. Twenty English-language guidelines published within the previous ten years were prioritised and assessed using the AGREE-II tool Domain 3 (Rigour of Development), applying a minimum 60% scaled domain score threshold. Overall, five high-quality international guidelines were selected as main reference guidelines. Recent systematic reviews and meta-analyses were identified from PubMed and Google Scholar to complement guideline evidence.

A multidisciplinary expert group (EG) comprising three infectious disease physicians, six family medicine physicians, two emergency medicine physicians, two geriatricians, two paediatricians, one ear, nose and throat surgeon, and two pharmacists, was appointed to provide clinical expertise throughout guideline development.

Draft recommendations were formulated using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) evidence-to-recommendation framework, incorporating five key domains: balance of benefits and harms; certainty of evidence; values and preferences; resources and feasibility; and acceptability and other considerations. EG members individually rated recommendation appropriateness using the RAND/UCLA Appropriateness Method, followed by structured discussions to achieve consensus.

Recommendation 1: Assess patients' clinical signs and symptoms and establish a working diagnosis (e.g. uncomplicated URTI, acute rhinosinusitis, pharyngotonsillitis, acute otitis media).

Strength of recommendation: **Strong** Conditional

Summary: URTIs are diagnosed clinically based on presenting signs and symptoms. Common symptoms include sore throat, cough, nasal congestion, nasal discharge, earache, malaise and/or fever.[6,7] In the absence of red flags, blood tests and radiological scans are unnecessary.

Balance of benefits and harms

Although there are limitations to the accuracy of clinical assessment in differentiating between bacterial and viral URTI during the early course of illness,[8–10] this differentiation may not be essential in uncomplicated URTI because most URTIs are caused by viruses and typically follow a self-limiting course.

Otoscopy can guide the diagnosis of AOM, especially in the paediatric population, due to the high positive likelihood ratio (LR+) of otoscopic finding in association with AOM – middle ear inflammation [redness: LR+ 8.4, 95% confidence interval (CI) 7–11] and effusion (cloudy: LR+ 34, 95% CI 28–42; bulging: LR+ 51, 95% CI 36–73; immobile: LR+ 31, 95% CI 26–37).[11]

Across various guidelines, experts agree that blood tests [e.g. leukocytes, C-reactive protein (CRP), erythrocyte sedimentation rate (ESR) and procalcitonin] and radiological scans (e.g. chest X-ray) are unnecessary, especially in the absence of red flags.[10,12]

Certainty of evidence	Values and preferences
There is low certainty of evidence regarding diagnostic practices for URTI, as these are primarily based on expert consensus. There is high certainty of evidence supporting the use of otoscopic findings to diagnose AOM.	Adopting a clinical approach to URTI diagnosis aligns well with expected patient preferences for avoiding unnecessary investigations (e.g. blood tests).
Resources and feasibility	**Acceptability and other considerations**
A clinical approach to URTI diagnosis aligns well with local clinical practices.	Nil significant concerns identified.

EG deliberation of the above factors

The EG agrees that URTI can be diagnosed based on clinical signs and symptoms. Despite being based primarily on expert consensus, this practice is widely accepted amongst clinicians as standard practice, and the EG agrees that it warrants a strong recommendation. Additional workup would only be indicated if an alternative diagnosis or more complicated infection is suspected.

Recommendation 2: Do not prescribe antibiotics for patients with uncomplicated URTI.		
Strength of recommendation:	**Strong**	Conditional

Summary:
Although antibiotics may provide modest symptom reduction in uncomplicated URTI, their use is strongly discouraged. The clinical benefit of antibiotics is limited given the self-limiting nature of URTIs and the rarity of complications. Furthermore, indiscriminate antibiotic use is associated with adverse effects and contributes to the significant public health concern of antimicrobial resistance (AMR).

Balance of benefits and harms

Antibiotic use for uncomplicated URTI demonstrates comparable numbers-needed-to-treat for benefit (NNTB) and harm (NNTH), indicating similar proportions of patients may experience modest benefits and adverse effects.

Benefits associated with antibiotic use included reduction in sore throat symptoms at day 3 [relative risk (RR) 0.70, 95% CI 0.60–0.80; NNTB <6] and one week (RR 0.50, 95% CI 0.34–0.75; NNTB 18),[13] reduction in headache at day 3 (RR 0.49, 95% CI 0.34–0.70),[13] shortened recovery time for rhinosinusitis-like symptoms [odds ratio (OR) 1.25, 95% CI 1.02–1.54; NNTB 19],[14] faster resolution of purulent secretion (OR 1.58, 95% CI 1.13–2.22; NNTB 10),[14] and reduction in pain associated with AOM (in children) at day 2–3 (RR 0.71, 95% CI 0.58–0.88; NNTB 20) and day 10–12 (RR 0.33, 95% CI 0.17-0.66; NNTB 7), but not at day 4–7 (RR 0.76, 95% CI 0.50–1.14).[15] Delayed, immediate, or no antibiotics made no difference in cough duration and severity.[16,17]

Harms associated with antibiotic use included increased adverse effects (primarily gastrointestinal) in patients with rhinosinusitis-like symptoms (OR 2.21, 95% CI 1.74–2.82; NNTH 8)[14] and AOM (RR 1.38, 95% CI 1.16–1.63; NNTH 14).[15] Antibiotic use also promoted development of AMR at 0–1 month (pooled OR 2.1, 95% CI 1.0–4.2), 0–2 months (pooled OR 2.4, 95% CI 1.4–3.9), and 0–12 months (pooled OR 2.4, 95% CI 1.3–4.5).[18]

Antibiotics (compared to placebo) may reduce complications of URTIs; however, this is of limited clinical significance given the low incidence of such events, and the NNTBs are exceptionally high. By extension, harms associated with not prescribing are minimal. Some examples include:

- Reduced risk of pneumonia hospitalisation amongst patients with URTI (adjusted risk difference 8.16, 95% CI -13.24 – -3.08; NNTB 12,255).[19]
- Reduced risk of acute mastoiditis amongst patients with AOM (incidence 0.02%, RR 0.48, 95% CI 0.40–0.59; NNTB 5,368)[20]
- Reduced odds for suppurative complications amongst patients with pharyngitis, including reduced AOM within 14 days (Peto OR 0.21, 95% CI 0.11–0.40; n=3646, total events 28 vs 10) and quinsy within two months (Peto OR 0.16, 95% CI 0.07–0.35; n=2433, total events 23 vs 2), but not acute sinusitis within 14 days (Peto OR 0.46, 95% CI 0.10–2.05; n=2387, total event 4 vs 4)[13]
- Reduced odds for rheumatic fever amongst patients with pharyngitis (Peto OR 0.07, 95% CI 0.00–1.32; n=5147, total events 74 vs 37)[13]

Certainty of evidence	Values and preferences
There is high certainty of evidence that antibiotic use in uncomplicated URTI is associated with modest benefits in symptom reduction, and high certainty of evidence that antibiotic use is associated with adverse effects. Certainty of evidence is low to moderate for AMR development associated with antibiotic use due to possible publication bias.	Individual patient preferences are expected to vary regarding the trade-off between modest symptom improvement and potential risks of side effects or AMR.
Resources and feasibility	**Acceptability and other considerations**
Patient expectation of and demand for antibiotics can influence antibiotic prescribing practices,[21,22] with such expectations increasing the odds of receiving antibiotics by 10.6 times (OR 10.64, 95% CI 5.34–21.17).[23] Furthermore, the additional time required for patient education and counselling when not prescribing antibiotics in uncomplicated URTI may deter time-poor prescribers from adopting the proposed guidance. However, in a local survey, most PCPs (82.7%) recognised that overprescribing of antibiotics is common, and this may suggest possible openness to increased antibiotic stewardship practices.[2]	Two local studies highlighted that some patient subgroups are more likely to expect antibiotics, including patients: [23,24] • presenting with sore throat (OR 1.50, 95% CI 1.07–2.10) or fever (OR 1.46, 95% CI 1.01–2.12); • perceiving their illness as serious (OR 1.70, 95% CI 1.27–2.27) and believing that antibiotics cure URTI faster (OR 5.35, 95% CI 3.76–7.62); • with knowledge gaps, including not knowing that URTI self-resolves (OR 2.18, 95% CI 1.08–2.06) and having poor [adjusted OR (aOR) 2.16, 95% CI 1.26–3.68] to moderate (aOR 2.26, 95% CI 1.33–3.84) knowledge about antibiotic use and resistance; and • with prior consultation for the current illness, regardless of whether antibiotics were prescribed (aOR 6.56, 95% CI 3.30–13.11) or not (aOR 1.50, 95% CI 1.01–2.23). Hence, acceptability amongst patients is expected to be mixed should antibiotics not be prescribed on clinical grounds, particularly amongst patients expecting antibiotics.
EG deliberation of the above factors	
The EG weighed the risks and benefits of antibiotic use in uncomplicated URTI, including the very low risk of developing complications from URTIs, and the modest and possibly clinically insignificant reduction in symptom duration from prescribing. The EG concluded that antibiotic use in uncomplicated URTI is inappropriate and would likely cause more individual harm than benefit, plus contribute to societal harm through the inadvertent promotion of AMR. Where needed, patients should be advised on the risks of inappropriate antibiotic use to address acceptability concerns.	

Recommendation 3: For patients with acute rhinosinusitis, pharyngotonsillitis or acute otitis media:

when a bacterial infection is clinically suspected, consider if an antibiotic is needed based on clinical features and individual risk factors for severe disease outcome.

Strength of recommendation: Strong **Conditional**

Summary: The need to initiate antibiotics for a patient with acute rhinosinusitis, pharyngotonsillitis or AOM should be determined through clinical features suggesting the presence of a significant bacterial infection. Should patient factors predispose them to severe disease outcome, clinical judgement should be exercised to decide if treatment threshold needs to be lowered. Overall, a conditional recommendation is proposed to reflect the flexibility required during decision making and because of the low certainty of evidence.

Balance of benefits and harms

Given the low risk of serious complications for rhinosinusitis, pharyngotonsillitis and AOM,[13,20,25,26] antibiotics should be reserved for patients who present with signs and symptoms suggestive of a significant bacterial infection. Criteria defining significant bacterial infections are largely based on consensus across published guidelines; these criteria (as listed in the URTI ACG) typically outline clinical features that indicate more severe illness (e.g. non-resolving/ worsening/ severe symptoms) which, by extension, raise clinical suspicion of a bacterial, rather than viral, infection.[10,12,27–31]

Certainty of evidence	**Values and preferences**
Low certainty of evidence as criteria are predominantly based on expert consensus.	If a significant bacterial infection is present, patients are expected to value early antibiotic therapy for early symptom resolution and avoidance of complications despite the risk of short-term adverse effects from antibiotic use.
Resources and feasibility	**Acceptability and other considerations**
The assessment of the clinical features and risk factors listed in the ACG are part of standard clinical practice. The McIsaac score (suggested clinical scoring tool) for pharyngotonsillitis is an exception,[12] where clinicians may need to make a deliberate decision to calculate and document it; this necessitates additional time and a longer consultation.	Objective clinical measures to guide decision-making regarding antibiotic prescribing would likely be well received by practitioners.

EG deliberation of the above factors

Based on the EG members' clinical experience and international practices, the EG agreed that the criteria (as listed in the URTI ACG) can serve as a basis to suspect the presence of a clinically significant bacterial infection for the named conditions. However, clinical judgement remains essential, particularly for certain patient populations who may present with atypical or subtle manifestation even when a significant bacterial infection is present, e.g. reduced responsiveness to social cues in young children, or hyper- or hypo-active delirium in older adults.

Recommendation 4: Do not routinely prescribe antivirals for otherwise healthy patients with uncomplicated URTI.

Strength of recommendation: ~~Strong~~ **Conditional**

Summary: The use of antivirals for uncomplicated URTI in otherwise healthy patients is not routinely recommended. The conditional recommendation is made after weighing the marginal clinical benefits of antivirals against the potential side effects, associated costs, and low risk of severe disease in the otherwise healthy population.[32–34] For patients at high risk of severe disease, antivirals (baloxavir or oseltamivir for influenza; nirmatrelvir + ritonavir for mild–moderate COVID-19) may be appropriate for treatment and prophylaxis of influenza, and for treatment of COVID-19.

Balance of benefits and harms

Baloxavir or oseltamivir for non-severe influenza

For influenza treatment, oral antivirals (baloxavir or oseltamivir) demonstrated only modest benefits in reducing symptom duration, when prescribed within 36 to 48 hours from symptom onset.[32,35–37] In one systematic review and network meta-analysis, baloxavir and oseltamivir reduced time to symptom alleviation by 24 hours and 18 hours, respectively.[32] For adults with influenza, treatment with oral antivirals resulted in no difference in hospitalisation rates (baloxavir: RR 0.24, 95% CI 0.05–1.19; oseltamivir: RR 0.80, 95% CI 0.54–1.18) or mortality (baloxavir: RR 0.83, 95% CI, 0.14–4.82; oseltamivir: RR 0.84, 95% CI 0.34–2.07) regardless of risk profile.[32] Data for children is sparse.[35]

For influenza prophylaxis, oral antivirals reduced symptomatic influenza in high-risk individuals (baloxavir: RR 0.43, 95% CI 0.23–0.79; oseltamivir: RR 0.40, 95% CI 0.26–0.62; moderate evidence certainty) when promptly administered within 48 hours post exposure to seasonal influenza.[38]

The safety profiles of oral antivirals differ. Baloxavir is not associated with increased adverse events (RR 0.74, 95% CI 0.57–0.95), while oseltamivir is associated with an increased adverse events (RR 1.23, 95% CI 1.1–1.39).[32] Adverse events included gastrointestinal effects (e.g. vomiting, diarrhoea, nausea, abdominal pain), laboratory abnormalities (e.g. liver function test abnormalities) and neurological effects (e.g. headache, dizziness).[32] Another systematic review further demonstrated that oseltamivir increased the risk of nausea (RR 1.57, 95% CI 1.14–2.51; NNTH 28, 95% CI 14–112) and vomiting (RR 2.43, 95% CI 1.75–3.38; NNTH 22, 95% CI 14 to 42) amongst adults, and vomiting (RR 1.70, 95% CI 1.23–2.35; NNTH 19, 95% CI 10–57) in children.[35]

Nirmatrelvir + ritonavir for COVID-19

Nirmatrelvir + ritonavir reduced COVID-19-related hospitalisation or mortality in the unvaccinated population by 6.32% (95% CI, -9.04− -3.59%; P<0.001; RR reduction, 89.1%).[39] Two systematic reviews and meta-analyses (consisting of studies with populations of varying vaccination status) further demonstrated nirmatrelvir + ritonavir efficacy in reducing hospital admission for mild–moderate COVID-19 when compared to standard care (OR 0.15, 95% CI 0.07 to 0.32,[40] and RR 0.15, 95% CI 0.24–0.69).[41] The benefits of nirmatrelvir + ritonavir were similarly observed, albeit to a smaller extent, in a local cohort study of mostly vaccinated adults with mild–moderate COVID-19, where nirmatrelvir + ritonavir reduced the odds of hospitalisation compared to supportive care alone (aOR 0.60, 95% CI 0.48–0.75, NNTB 149).[34] In the subgroup of immunocompromised individuals, the benefits for hospitalisation outcomes were more pronounced, with a lower NNTB (aOR 0.46, 95% CI 0.24–0.88, NNTB 42).[34]

Treatment with nirmatrelvir + ritonavir does not increase the likelihood of adverse effects leading to discontinuation,[40] although dysgeusia (5.6% vs. 0.3%) and diarrhoea (3.1% vs. 1.6%) occurred more frequently with nirmatrelvir + ritonavir than with placebo.[39]

There is possibility for major interactions between nirmatrelvir + ritonavir with medications that are primarily metabolised by CYP3A or are strong CYP3A inducers, leading to elevated medication concentration which may cause serious or life-threatening reactions, or reduce virologic response for nirmatrelvir + ritonavir. Classes of concern include analgesics (e.g. opioids), antiarrhythmics (e.g. amiodarone), anticoagulants or antiplatelets (e.g. direct-acting oral anticoagulants, clopidogrel), antiepileptics (e.g. carbamazepine, phenobarbital), antidepressants, cholesterol-lowering medications (e.g. simvastatin, rosuvastatin), and antipsychotics (e.g. quetiapine).[42,43]

Certainty of evidence	**Values and preferences**
Baloxavir or oseltamivir There is moderate certainty of evidence for time to alleviation of symptoms (downgraded for imprecision and risk of bias), treatment-related adverse events and serious adverse events (downgraded for inconsistency and risk of bias). The certainty of evidence for lack of effect on hospitalisation rates and mortality outcomes is high, except for baloxavir's effect on hospitalisation in the high-risk population which has low certainty of evidence (due to very serious imprecision). Nirmatrelvir + ritonavir There is high certainty of evidence for the lack of adverse effects leading to drug discontinuation. There is low certainty of evidence for its effect on hospitalisation rates. Although the results are congruent with systematic reviews of populations with heterogeneous vaccination status, the evidence amongst vaccinated population remains based on a local observational study and the effect size is not sufficiently large to justify an upgrade.[34]	Baloxavir and oseltamivir Although not clinically significant, the use of antivirals in influenza for shortening symptom duration (of up to 24 hours) may be deemed important and beneficial by some patients, especially when symptoms impede daily routine (e.g. children or adults returning to school or work, respectively). Nirmatrelvir + ritonavir No significant concerns identified

Resources and feasibility	Acceptability and other considerations
Timely access to antivirals may be of concerns in primary care settings as baloxavir, oseltamivir and/or nirmatrelvir + ritonavir may not be part of the standard formulary at some primary care practices. Furthermore, baloxavir and oseltamivir are not subsidised locally, whilst nirmatrelvir + ritonavir is subsidised under the Medication Assistance Fund (MAF) for treating mild–moderate COVID-19, subject to meeting MAF criteria.[44] Given the various limitations to access, the use of antivirals in high-risk individuals may be restricted.	No significant concerns identified.

EG deliberation of the above factors

The EG agreed that antivirals should not be used routinely in an otherwise healthy population, considering the self-limiting nature of uncomplicated URTIs, the small net clinical benefit relative to the potential harms, resource and accessibility considerations, and uncertainty regarding whether antiviral use may contribute to the emergence of resistance. For otherwise healthy patients with confirmed influenza [via Rapid Antigen Detection Test (RADT) or polymerase chain reaction (PCR)], the EG acknowledged that some individuals may place high value on the modest benefit of faster recovery relative to the potential adverse effects; in such cases, prescribing baloxavir or oseltamivir may be reasonable after appropriate counselling on the associated risks and benefits.

The EG also recognised the potential role of early antiviral therapy for influenza and COVID-19 in high-risk populations (e.g., immunocompromised individuals). The conditional recommendation against routine antiviral use applies specifically to otherwise healthy patients with uncomplicated URTIs. Clinicians should exercise discretion and individualise treatment plans, particularly for patients at higher risk of complications from URTIs with potentially poor outcomes.

Implementation/Uptake of recommendations

Timely adoption and systematic implementation of these evidence-based recommendations across healthcare settings are vital to support practice change, reduce inappropriate antimicrobial prescribing for URTIs and curtail the development of AMR. Healthcare organisations, institutions, and clinicians can consider the following implementation strategies:

- **Patient counselling and empowerment:** Clinicians are highly encouraged to provide clear explanations about appropriate antimicrobial use, especially when antibiotics are not required, as patient knowledge of AMR can reduce antibiotic expectations and lower antibiotic prescription rates.[45] PCPs can leverage their trusted position with patients as pivotal educators to promote judicious antimicrobial use.
- **Education and training**: Continuing medical education programmes can enhance diagnostic accuracy, promote appropriate antimicrobial prescribing practices (for antibiotics and antivirals), and build clinical confidence in URTI management through emphasising the evidence base supporting these recommendations. Trainings, as part of professional development programmes, can also cover patient education techniques, focusing on explaining prescribing decisions and addressing patient expectations when antimicrobials are not prescribed.
- **Integration into clinical pathways**: Healthcare clusters can update guidelines, protocols, and pathways to incorporate these recommendations, with considerations for developing evidence-based strategies to reduce unnecessary antimicrobial use, such as delayed prescribing workflows.
- **Antimicrobial stewardship programmes**: There is potential for further expansion of antimicrobial stewardship programmes to curb AMR driven by unnecessary antibiotic use, with possible exploration of establishing audit and feedback mechanisms in primary care settings. PCPs can also consider participating in the Antimicrobial Resistance Coordinating Office's GP-Antimicrobial Utilisation Surveillance Initiative (GP-AMU) programme to contribute towards national efforts for data-driven optimisation of antimicrobial utilisation in primary care.
- **Public health initiatives**: National public education campaigns can reinforce the public's awareness of their role in curbing AMR by educating them about the predominance of viral aetiology in URTIs, the ineffectiveness of antibiotics for viral infections, and the consequences of unnecessary antimicrobial consumption to discourage inappropriate requests for antimicrobials.

Conclusion

This EtR framework summarises the evidence base, rationale, and expert deliberations that underpin the ACG recommendations for the rational use of antimicrobials for URTIs, providing clinicians with the necessary context to interpret and apply the guideline effectively in clinical practice.

Whilst applicable across all care settings, these recommendations are particularly relevant for PCPs who manage the majority of URTI presentations. Aligned with Singapore's National Strategic Action Plan on AMR[46] and endorsed by the Communicable Diseases Agency Singapore, the guideline covers clinical assessment, diagnosis and management of URTIs, focusing on appropriate antimicrobial use where clinically indicated. The primary objective is to guide the assessment and management of URTIs to reduce inappropriate antimicrobial prescribing.

Successful implementation requires a systematic, multi-faceted approach that extends beyond individual practice. Collective adoption of these recommendations across diverse care settings will contribute to coordinated national efforts to preserve antimicrobial effectiveness and strengthen antimicrobial stewardship whilst maintaining optimal patient care standards.

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