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Expert Consensus Recommendations on Adult Acute Sore Throat Management in Southeast Asia: A Modified Delphi Statement

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Research

Expert Consensus Recommendations on Adult Acute Sore Throat Management in Southeast Asia: A Modified Delphi Statement

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ABSTRACT

Background: International guidelines recommend judicious antibiotic use for acute sore throat. However, inappropriate prescribing remains common across Southeast Asia, contributing to the region's growing burden of antimicrobial resistance (AMR). This consensus statement provides a regionally harmonised framework to optimise adult sore throat management and strengthen antimicrobial stewardship.

Methods: A multidisciplinary panel of 13 healthcare experts from six Southeast Asian countries participated in a study employing a modified Delphi methodology. Based on a structured literature review, 12 preliminary statements were drafted addressing prescribing patterns, diagnostic strategies, and symptomatic treatments. The panel refined and voted on these statements. A priori consensus threshold was set as ≥ 70% agreement (10/13 experts), while strong consensus was set as ≥ 80% agreement.

Results: All 12 statements achieved strong consensus, with 92.3% to 100% agreement. The panel identified public misconception and physician diagnostic uncertainty as primary drivers of inappropriate prescribing. To minimise unwarranted antibiotics, the consensus recommends utilising the McIsaac score for clinical evaluation, combined with targeted point-of-care testing for patients with intermediate scores of 3 or 4. Empirical antibiotics are strictly reserved for maximum scores. Furthermore, the panel strongly endorsed prompt targeted symptomatic therapy including topical non-steroidal anti-inflammatory drugs, specifically flurbiprofen, as a crucial strategy to alleviate patient discomfort and potentially reduce unnecessary antibiotic use.

Conclusions: This regionally harmonised consensus bridges the gap between international guideline recommendations and the clinical realities of Southeast Asia. It empowers primary care practitioners to adapt objective risk-stratification and effective symptomatic management to their specific healthcare resource contexts, serving as the frontline defence against AMR.

Keywords: Antimicrobial resistance, pharyngitis, acute sore throat, antibiotic, symptomatic treatment

BACKGROUND

Acute sore throat is a common clinical condition resulting from inflammation of the pharynx, tonsils, or nasopharynx and is predominantly caused by viral infections, although bacterial pathogens, particularly group A Streptococcus (GAS) may also be responsible [1]. The burden of disease is substantial, affecting adults at an estimated rate of 13.5 episodes per 100 patient-years and children at rates reaching 82.5 episodes per 100 patient-years [2, 3]. Although acute sore throat is typically self-limiting, its impact on daily functioning and workplace productivity creates a substantial societal burden [4]. Consequently, treatment prioritises symptomatic relief to improve functional recovery, while reserving antibiotics for confirmed bacterial infections [5].

This issue is particularly pronounced in low- and middle-income settings. Clinicians frequently contend with diagnostic uncertainty, sustained patient expectations for rapid symptom relief, and constrained access to reliable point-of-care diagnostics. Given these pressures, clinicians often rely on broad-spectrum antibiotics as a default fallback despite the obvious clinical downsides. The situation is especially concerning in Southeast Asia, which has been identified as a major hotspot for antimicrobial resistance (AMR) [6, 7]. This regional burden underscores the urgent need for evidence-based antimicrobial stewardship strategies that are practical and feasible within routine clinical practice.

International guidelines provide evidence-based recommendations for sore throat management [1, 8, 9] but their applicability to Southeast Asia is limited by differences in healthcare infrastructure,

prescribing practices, patient expectations, and diagnostic access. In addition, region-specific guidance is still limited or varies considerably across countries, leading to substantial differences in clinical practice. Under these circumstances, expert consensus approaches can help integrate available evidence with regional expertise to address areas where robust data may be lacking or not directly transferable.

This consensus statement was prepared to guide the management of acute sore throat in adults across Southeast Asia. It offers evidence-based recommendations while drawing particular attention to curbing unnecessary antibiotic prescriptions and strengthening antimicrobial stewardship in everyday practice. It is intended for healthcare providers in general, particularly primary care practitioners who commonly serve as the first point of contact for these patients.

METHODS

The methodology adopted for this consensus statement was guided by the 'Conducting and Reporting Delphi Studies (CREDES)' recommendations [10], which provide a structured framework for conducting and reporting Delphi-based research.

Working Group Composition

The Working Group was established to ensure broad multidisciplinary representation across Southeast Asia. The multidisciplinary panel consisted of 13 healthcare professionals encompassing ten otolaryngologists, two primary care physicians, and one clinical pharmacist. These experts were recruited from six countries across the region with five members originating from Malaysia, two each from the Philippines, Thailand and Vietnam, and single representatives from both Indonesia and Singapore.

Defining the Consensus Scope

Three key clinical questions were identified to shape the scope of the consensus and support the evidence review and statement development. The process began with an attempt to understand the extent of inappropriate antibiotic prescribing for acute sore throat in Southeast Asia, along with the key factors driving this pattern. The panel subsequently reviewed the available evidence on strategies to reduce unnecessary antibiotic use in adults and explored the potential role of symptomatic treatments in supporting antimicrobial stewardship in the acute care setting.

Literature Search and Evidence Appraisal

To address the clinical questions, a structured search of the PubMed database was performed to identify relevant literature published from 2010 until March 2026. The complete search strategy using relevant keywords, MeSH terms, and Boolean operators is detailed in Supplementary Table 1-3. Eligible publications included randomised controlled trials (RCTs), observational studies, systematic reviews, meta-analyses, consensus statements, and clinical practice guidelines. Studies were excluded if they were published in languages other than English, involved children younger than 12 years of age, or were narrative reviews. Regional evidence and country-specific clinical policies are often underrepresented in major electronic databases. Therefore, additional manual searches using Google were undertaken to identify relevant grey literature and official clinical practice guidelines from international organisations and national ministries of health.

Twelve preliminary statements addressing the core clinical questions were drafted following review of the available evidence. These statements were then evaluated through a Delphi process in which the evidence was critically discussed and refined to produce evidence-based recommendations. The level of evidence was graded according to the Oxford Centre for Evidence-Based Medicine 2009 Levels of Evidence [11]. Evidence was categorised into five levels based on methodological rigor. Systematic reviews and meta-analyses of RCTs were considered Level 1 evidence, whereas individual RCTs were classified as Level 2. Non-randomised cohort studies, case-control studies, and expert opinion or

consensus were categorised as Levels 3, 4, and 5, respectively. Recommendations were then assigned grades A to D based on the overall strength and quality of the supporting evidence.

Consensus Development Process

The consensus process followed a modified Delphi methodology. The Working Group first convened in a hybrid meeting held on May 9, 2026, in Kuala Lumpur, Malaysia. During this session, panel members reviewed the available evidence, discussed areas of uncertainty, and collaboratively refined the wording of the draft statements. Following the meeting, all panel members participated in an anonymous online voting round to assess agreement with the finalised statements. Each item was scored using a 5-point Likert scale consisting of strongly agree, agree, neutral, disagree, and strongly disagree. Consensus was defined *a priori* as the combined proportion of "strongly agree" and "agree" responses. *A priori* consensus threshold was set as ≥ 70% agreement (10/13 experts), while strong consensus was set as ≥ 80% agreement (11/13 experts). To improve transparency and capture differing opinions, respondents who selected "disagree" or "strongly disagree" were required to provide a written rationale for their responses. Descriptive analysis was performed to summarise the results.

RESULTS

Overview of Consensus Development

All statements reached strong consensus after a single round of voting. Most statements achieved 100% agreement while Statements 3 and 6 each received 92.3% agreement. The consensus statement, level of agreement and recommendations are presented in Table 1. The supporting literature and corresponding levels of evidence are shown in Table 2.

Table 1. Consensus recommendations for Grades of Recommendation and level of agreement.

No.	Statements	Grades of Recommendation	Levels of agreement (%)
Section 1: Inappropriate antibiotic prescribing for acute sore throat in Southeast Asia			
1	Antibiotics are often prescribed inappropriately for acute sore throat in Southeast Asia.	NA	100
2	Public misconception about antibiotic use is a major driver of inappropriate antibiotic prescribing for acute sore throat in Southeast Asia.	NA	100
3	Diagnostic uncertainty leads to inappropriate antibiotic prescribing among practitioners.	NA	92.3
4	Inappropriate antibiotic prescribing for acute sore throat may increase antimicrobial resistance, expose patients to unnecessary adverse effects, and raise healthcare costs.	NA	100
Section 2: Evidence-based strategies to minimise unnecessary antibiotic prescribing			
5	Established clinical scoring systems should be used to evaluate the likelihood of group A *Streptococcus* infection and guide management decisions to reduce avoidable antibiotic use.	B	100
6	Point-of-care testing for group A *Streptococcus* should be considered for patients with a McIsaac score of 3 or 4 to support diagnosis and antibiotic prescribing.	B	92.3
7	Patients with a McIsaac score of 5 should receive first-line antibiotics, together with counselling to ensure adherence to the prescribed course.	B	100
Section 3: Role of symptomatic therapy in supporting antimicrobial stewardship			
8	Prompt symptomatic therapy is recommended for patients with acute sore throat to lessen symptom burden.	D	100

9	Topical treatment provides local anti-inflammatory and/or pain-relieving effects and can be included in symptomatic care for acute sore throat.	A	100
10	Topical flurbiprofen is a treatment option for acute sore throat that provides targeted, rapid and sustained pain relief and is generally well tolerated.	A	100
11	Effective symptom control may help reduce unnecessary antibiotic use.	A	100
12	Patients with warning signs (red flags) or prolonged symptoms beyond the usual course should be referred for specialist evaluation.	D	100

NA: not applicable.

Table 2. Level of Evidence for identified literature.

No.	Statements	Levels of Evidence: number of studies
Section 1: Inappropriate antibiotic prescribing for acute sore throat in Southeast Asia		
1	Antibiotics are often prescribed inappropriately for acute sore throat in Southeast Asia.	Level 2: 1 [12] Level 3: 4 [13-16] Level 4: 8 [17-24]
2	Public misconception about antibiotic use is a major driver of inappropriate antibiotic prescribing for acute sore throat in Southeast Asia.	Level 3: 7 [25-31] Level 4: 6 [21, 32-35]
3	Diagnostic uncertainty leads to inappropriate antibiotic prescribing among practitioners.	Level 3: 3 [36-38] Level 4: 1 [35]
4	Inappropriate antibiotic prescribing for acute sore throat may increase antimicrobial resistance, expose patients to unnecessary adverse effects, and raise healthcare costs.	Level 1: 1 [39] Level 2: 2 [40, 41] Level 3: 1 [42]

		Level 4: 2 [20, 43]
Section 2: Evidence-based strategies to minimise unnecessary antibiotic prescribing		
5	Established clinical scoring systems should be used to evaluate the likelihood of group A *Streptococcus* infection and guide management decisions to reduce avoidable antibiotic use.	Level 1: 3 [9, 44, 45] Level 3: 3 [46-48] Level 4: 1 [49]
6	Point-of-care testing for group A *Streptococcus* should be considered for patients with a McIsaac score of 3 or 4 to support diagnosis and antibiotic prescribing.	Level 2: 3 [50-52] Level 3: 1 [46] Level 5: 2 [45, 53]
7	Patients with a McIsaac score of 5 should receive first-line antibiotics, together with counselling to ensure adherence to the prescribed course.	Level 1: 1 [54] Level 5: 2 [55, 56]
Section 3: Role of symptomatic therapy in supporting antibiotic stewardship		
8	Prompt symptomatic therapy is recommended for patients with acute sore throat to lessen symptom burden.	Level 1: 2 [1, 54] Level 5: 3 [8, 55, 57]
9	Topical treatment provides local anti-inflammatory and/or pain-relieving effects and can be included in symptomatic care for acute sore throat.	Level 1: 12 [58-69] Level 2: 2 [70, 71]
10	Topical flurbiprofen is a treatment option for acute sore throat that provides targeted, rapid and sustained pain relief and is generally well tolerated.	Level 1: 6 [59, 64, 66, 67, 72] Level 2: 2 [73, 74] Level 5: 1 [75]
11	Effective symptom control may help reduce unnecessary antibiotic use.	Level 1: 2 [76, 77] Level 5: 1 [78]
12	Patients with warning signs (red flags) or prolonged symptoms beyond the usual course should be referred for specialist evaluation.	Level 5: 4 [5, 8, 53, 79]

Summary of Evidence for the Consensus Statements

Section 1: Inappropriate antibiotic prescribing for acute sore throat in Southeast Asia (Statements 1-4)

166 Inappropriate antibiotic prescribing for acute sore throat commonly involves deviation from
167 established guidelines, including the treatment of viral infections and the use of incorrect agents,
168 doses, or treatment durations [80]. Globally, approximately 45% of outpatient respiratory infection
169 prescriptions are considered inappropriate, with Asia reporting the highest rate at 49% [17]. The
170 prevalence of inappropriate antibiotic prescribing for acute sore throat in Southeast Asia shows
171 remarkable variation, ranging from 13.8% to 92.9% (Table 3) [12-16, 18-24].

172 **Table 3.** Inappropriate antibiotic prescribing for acute sore throat or respiratory tract infections in Southeast Asia.

Country	Author (year)	Population	Inappropriate antibiotic prescribing
Indonesia	Yuniar CT, *et al.* (2017) [18]	Patients with acute pharyngitis (N = 1,644)	80% of patients were overprescribed antibiotics
Malaysia	Muthanna AR, *et al.* (2021) [19]	Patients with sore throat (N = 215)	87.5% of patients prescribed antibiotics had a Centor score of 0 to 2
	Shamsuddin S, *et al.* (2016) [12]	Medical records of patients prescribed antibiotics (N = 735)	18.4% of URTI cases were inappropriately prescribed amoxicillin
	Bo ZM, *et al*. (2022) [20]	Patients with acute pharyngitis (N = 205)	Only 42.9% of antibiotic prescriptions were appropriate; 58.5% of patients received antibiotics despite only 2.4% testing positive for GAS species
	Rezal RS, *et al.* (2015) [13]	Prescription records from patients with URTI (N = 7,129)	92.9% of patients with sore throat were prescribed erythromycin
	Hassali MA, *et al.* (2015) [21]	GPs working in private clinics (N = 139)	21.6% of GPs prescribed antibiotics to patients who requested it, even if they were unnecessary

Philippines	Dominguez RJ, *et al.* (2023) [22]	Patients with COVID-19 infection and were hospitalised (N = 157)	57.3% of patients received antibiotics but only 1.9% had a bacterial co-infection
Singapore	Tan SH, *et al.* (2021) [23]	Antibiotic prescriptions in patients with suspected or confirmed COVID-19 (N = 51)	39% of antibiotic prescriptions were inappropriate
Thailand	Greer RC, *et al.* (2018) [14]	Medical records from patients with ICD-10 code for infection, prescribed antibiotics, and had fever (N = 97,230)	77.9% of patient presentations were respiratory related; 13.8% of all patients were prescribed antibiotics without an indication for fever or infection
	Donsamak S, *et al.* (2021) [15]	Community pharmacists across Thailand (N = 221)	49.2% of treatment recommendations were inappropriate; 32.5% of pharmacists recommended an overprescription of amoxicillin
	Boontein P, *et al.* (2026) [24]	Patients with URTI, acute diarrhoea, or fresh traumatic wounds (N = 556)	Only 10.8% of antibiotic prescriptions for URTI were appropriate
Vietnam	Zawahir S, *et al.* (2022) [16]	Clinical interactions across community pharmacies (N = 1,266)	88.2% of URTI cases were provided with antibiotics without a prescription

GAS: Group A Streptococcus; GP: general practitioner; ICD-10: International Classification of Diseases 10th Edition; URTI: upper respiratory tract infection.

173 The primary drivers of this overprescription are widespread public misconception and physician
174 diagnostic uncertainty. Between 47.2% and 73.5% of the public in Southeast Asia erroneously believe

antibiotics are effective against viral infections [26-30, 32, 33]. A Malaysian study similarly found that approximately 54% of patients believed antibiotics treat viral respiratory illnesses (unpublished data, B. Abdullah). Misunderstandings of this nature encourage patients to retain surplus medications and increase their anticipation of prescriptions, ultimately intensifying the pressures faced by clinicians during clinical consultations [21, 32, 34-36]. Furthermore, physician diagnostic uncertainty and the fear of misdiagnosis strongly correlate with increased antibiotic prescribing [35-38], a trend that is substantially mitigated when diagnostic tools are available [36].

AMR is a well-established consequence of inappropriate antibiotic prescribing, with increased antibiotic consumption associated with more than twice the odds of developing resistance [42, 43]. This complication is already evident in regional clinical isolates demonstrating high resistance to commonly used therapies such as cefotaxime and penicillin V [20]. Additionally, it exposes patients to unnecessary adverse events including *Clostridioides difficile* and non-*C. difficile* diarrhoea [40]. Prolonged inappropriate antibiotic therapy compounds patient risk, as each additional day of treatment is associated with higher rates of adverse events, including serious and clinically significant drug reactions that may prolong hospitalisation and increase healthcare utilisation [39, 41]. Inappropriate prescribing carries significant economic consequences, elevating 30-day healthcare expenditure by about USD 67 per case, largely due to increased outpatient encounters, pharmacy charges, and the need to manage drug-related adverse events [40]. Taken together, these findings demonstrate substantial inconsistency in antibiotic prescribing across Southeast Asia and reinforce the need for regionally harmonised recommendations.

Section 2: Evidence-based strategies to minimise unnecessary antibiotic prescribing (Statements 5-7)

Rather than depend chiefly on diagnostic testing, current guidelines recommend the use of clinical scoring systems to estimate the likelihood of GAS infection [9, 81]. While the Centor, FeverPAIN, and

McIsaac scores are globally recognised [1, 8, 9, 44, 46, 49, 54-57], the expert panel selected the age-adjusted McIsaac score as the preferred clinical prediction tool because it incorporates patient age and has been extensively validated in primary care populations, improving risk stratification across different age groups [46, 47]. Table 4 summarises the elements of the scoring systems. Despite their diagnostic shortcomings, the use of these tools alongside structured patient education may safely reduce inappropriate prescribing without increasing complication rates [48].

Table 4. Components of Centor, McIsaac, and FeverPAIN score.

Component	Centor [49]	McIsaac [46]	FeverPAIN [44]
Tonsillar exudates	1	1	1
Swollen tender anterior cervical nodes	1	1	
Fever (> 38°C)	1	1	1*
No cough	1	1	1
Symptom onset ≤ 3 days			1
Tonsillar swelling/redness			1
Age < 15 years		1	
Age 15-44 years		0	
Age > 45 years		-1	

*Fever during the preceding 24 hours.

Targeted point-of-care testing (POCT) is essential to restrict antibiotic use to confirmed GAS cases [53], particularly among patients with a moderate-to-high infection risk, defined by a McIsaac score of 3 or 4 and corresponding to a 27% to 63% probability of GAS infection [46]. Rapid antigen detection testing (RADT), especially conventional lateral flow devices, is generally preferred because it is low-cost, simple, rapid, and portable, while also showing reasonably high diagnostic performance, with sensitivity around 86% and specificity about 96% [50, 51, 82]. Overall, it remains a practical and cost-effective option in routine use.

In the absence of RADT, throat cultures and inflammatory biomarkers serve as valuable alternatives [83, 84]. However, widespread regional adoption necessitates robust cost-reduction strategies and the continued development of more rapid diagnostic tools to overcome prevailing financial and temporal barriers [45]. The experts noted that these challenges are evident in current clinical practice across the region. POCT is frequently not utilised in Singapore and Philippines, while its uptake in Malaysia continues to be constrained by cost considerations. In Thailand, the use of POCT remains largely confined to hospital settings despite evidence supporting its potential cost-effectiveness compared with empiric antibiotic treatment. Overcoming these barriers will be important to support broader implementation in routine care.

Regional guidelines differ in their recommendations, with some suggesting initiation of antibiotics at a McIsaac score of ≥3 and others at ≥4 (Table 5) [54-56]. Patients with the maximum score of 5 are generally considered for immediate empirical first-line therapy. Recommended regimens comprise a 5- to 10-day course of oral penicillin V or amoxicillin, or a single intramuscular injection of benzathine penicillin G (Table 6) [1, 8, 54-57, 85-87]. Since around 39% of patients discontinue therapy early (unpublished data, A. Watson), which contributes significantly to treatment failure [88], it is important that healthcare professionals provide thorough counselling on appropriate dosing and adherence to prescribed regimens to optimise outcomes and reduce AMR risk [57]. Recommendations on symptomatic treatment also varied as it was not addressed in some guidelines, restricted to non-GAS cases (McIsaac score < 2 or < 3), and designated as first-line therapy in others (Table 6) [1, 8, 54-57, 85-87]. Given that most acute sore throat cases are viral in aetiology and self-limiting [5], it is essential that healthcare professionals first consider symptomatic treatment, reserving antibiotics for bacterial infections to limit unnecessary antibiotic prescribing [6, 53].

Table 5. Recommendations on clinical scoring system from local and international guidelines.

Regional/ international	Guidelines	Recommended clinical scoring system			Clinical score threshold for RADT	Clinical score threshold for starting antibiotics
		Centor	McIsaac	FeverPAIN		
Malaysia	CPG 2003 [54]	-	√	-	McIsaac: 2-3	McIsaac: ≥ 4
	NAG 2026 [55]	-	√	-	-	McIsaac: ≥ 3
Philippines	CPG for family practice 2021 [57]	√	-	√	Centor: ≥ 3	Centor: ≥ 3 FeverPAIN: ≥ 4
Thailand	RDU in Community Pharmacy 2017 [56]	-	√	-	-	McIsaac: ≥ 3
International	IDSA 2025 [9]	√	√	-	Centor/McIsaac: ≥	-
	NICE 2018 [8]	√	-	√	No clear advantage of RADT with ↑	Centor: ≥ 3 FeverPAIN**: ≥ 4
	ESCMID [1]	√	-	-	Centor: ≥ 3	Centor: ≥ 3

**If FeverPAIN 2-3, consider no antibiotic or back-up antibiotic prescription.

CPG: clinical practice guidelines; ESCMID: European Society of Clinical Microbiology and Infectious Diseases; IDSA: Infectious Diseases Society of America;

Table 6. Regional and international recommendations for first-line antibiotic prescribing and symptomatic management of acute sore throat.

Regional/ International	Guidelines	Antibiotic prescribing						Recommends symptomatic treatment?
		Preferred first-line antibiotics			Dose	Duration	Alternative if allergy	
		Penicillin V (oral)	Benzathine penicillin G (IM injection)	Amoxycillin (oral)				
Malaysia	CPG 2003 [54]	√			250 mg TDS or QID, or 500 BD	10 days	Erythromycin, clarithromycin, or first-generation cephalosporin If erythromycin-intolerant: Clindamycin	Yes (McIsaac score < 2 or GAS-negative)
	NAG 2026 [55]	√			500 mg QID or 1 g BD	5–10 days†	Erythromycin	Yes (McIsaac score < 3)
			√		1.2 MU, stat	One single dose		
Philippines	NAG 2017 [85]	√			250 mg QID or 500 mg BD	10 days	Erythromycin ethylsuccinate, clarithromycin, azithromycin, cephalexin If severe penicillin allergy: Clindamycin	Not mentioned
			√		1.2 MU, stat	One single dose		
	CPG for family practice 2021 [57]	√			250 mg QID or 500 mg BD	10 days	Erythromycin ethylsuccinate, clarithromycin, azithromycin, cephalexin If severe penicillin allergy: Clindamycin	Yes (first-line treatment for all cases)
			√		1.2 MU, stat	One single dose		

Table 6 (Continued). Regional and international recommendations for first-line antibiotic prescribing and symptomatic management of acute sore throat.

Regional/ International	Guidelines	Antibiotic prescribing						Recommends symptomatic treatment?
		Preferred first-line antibiotics			Dose	Duration	Alternative if allergy	
		Penicillin V (oral)	Benzathine penicillin G (IM injection)	Amoxycillin (oral)				
Thailand	Antibiotic Smart Use [86]			√	500 mg BD or TDS	10 days	Non-type 1 hypersensitivity: Cephalexin Type-1 hypersensitivity: roxithromycin, azithromycin, clarithromycin, clindamycin	Not mentioned
	RDU in Community Pharmacy 2017 [56]	√			250 mg QID or 500 mg BD	10 days	Cephalexin, cefadroxil, clindamycin, azithromycin, clarithromycin	Yes (McIsaac score < 2)
				√	500 mg BD or 1 g OD	10 days		
International	NICE 2018 [8]	√			500 mg QID or 1 g BD	5–10 days‡	Clarithromycin (non-pregnant individuals), erythromycin (pregnant)	Yes (paracetamol first-line for pain or fever)
	ESCMID 2012 [1]	√			No dose specified, BD or TDS	10 days	-	Yes

Table 6 (Continued). Regional and international recommendations for first-line antibiotic prescribing and symptomatic management of acute sore throat.

Regional/ International	Guidelines	Antibiotic prescribing						Recommends symptomatic treatment?
		Preferred first-line antibiotics			Dose	Duration	Alternative if allergy	
		Penicillin V (oral)	Benzathine penicillin G (IM injection)	Amoxycillin (oral)				
International	CDC [87]	√			250 mg QID, or 500 mg BD	10 days	Cephalexin, cefadroxil, clindamycin, azithromycin, clarithromycin	Not mentioned
			√		1.2 MU, stat	One single dose		
				√	500 mg BD or 1 g OD	10 days		

BD: twice daily; CDC: Centers for Disease Control and Prevention; CPG: clinical practice guidelines; ESCMID: European Society of Clinical Microbiology and Infectious Diseases; GAS: Group A Streptococcus; IM: intramuscular; MU: million units; NAG: National Antibiotic Guidelines; NICE: National Institute for Health and Care Excellence; OD: once daily; QID: four times daily; RDU: rational drug use; stat: immediately; TDS: three times daily.

†Consider 10 days in settings with a high prevalence of rheumatic fever or in patients with a history of rheumatic fever or rheumatic heart disease and who are aged between 3 and 21 years. ‡Five days of phenoxymethylpenicillin may be enough for symptomatic cure, but a 10-day course may increase the chance of microbiological cure.

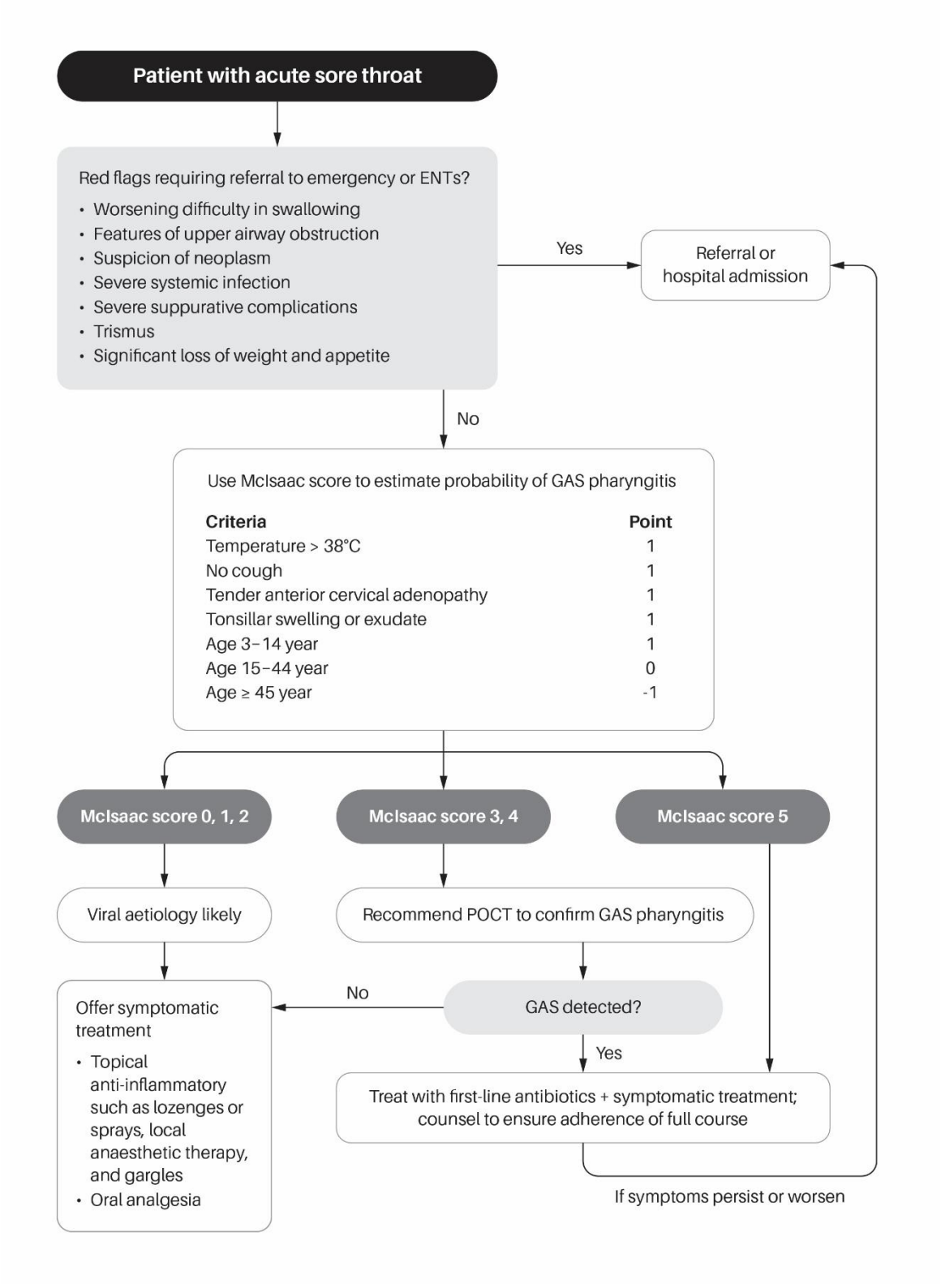
Section 3: Role of symptomatic therapy in supporting antimicrobial stewardship (Statements 8-12)

Generally, an acute sore throat is a largely self-limiting condition, lasting an average of seven days [5]. Whether the infection is viral or bacterial, the clinical course is usually similar with symptoms peaking around day 3 to 5 before resolving by day 10 [8, 89]. In view of this predictable clinical trajectory, management strategies ought to emphasise symptom relief as this has an important role in reducing unnecessary antibiotic prescriptions [53]. Contemporary guidelines advocate systemic analgesia such as paracetamol or ibuprofen [1, 8, 54, 55, 57], complemented by conservative self-care measures like adequate hydration and saline gargling [54, 57]. Additionally, topical therapies encompassing anti-inflammatories (e.g., flurbiprofen), antiseptics (e.g., amylmetacresol/2,4-dichlorobenzyl alcohol) and local anaesthetics (e.g., lidocaine, hexylresorcinol) are recommended for targeted symptomatic relief [58-67, 70, 90-93].

Topical non-steroidal anti-inflammatory drugs (NSAIDs) demonstrate localised analgesic and anti-inflammatory effects across a range of formulations [64, 65, 69], which may help alleviate symptoms such as pharyngeal pain, swelling, and dysphagia [58-71]. Within this class, flurbiprofen has been described as reducing local inflammation, potentially through downregulation of prostaglandin E2 synthesis [60]. Clinical data indicate a rapid onset of effect within minutes [64], followed by measurable improvement within one hour, with therapeutic effects persisting for up to six hours [59, 66, 67]. Additionally, topical flurbiprofen has been shown to produce analgesic effects comparable to those of oral NSAIDs, while its localised application minimises systemic exposure and may reduce the risk of systemic adverse effects commonly associated with oral NSAIDs [72, 94, 95]. Safety findings of topical flurbiprofen are generally reassuring, with no serious adverse events or significant drug-drug interactions reported in clinical studies [59, 66, 67, 73, 75]. Reported adverse effects have generally been mild and self-limiting, most commonly involving gastrointestinal symptoms or occasional reports of headache or dizziness [75]. Although prescribing guidelines typically limit utilisation to a maximum

of three days [96-98], expert consensus supports safe continuous use for up to five days, provided that refractory or worsening pain necessitate the need for clinical re-evaluation.

Optimising pain management plays a pivotal role in antimicrobial stewardship, with evidence demonstrating that patient demand for antibiotics rises more than sixfold when pain relief is the principal concern [78]. Given that antibiotics provide little symptomatic benefit for viral sore throat and marginally shorten the duration of symptoms [76, 77], reducing unwarranted antimicrobial prescribing should focus on optimal symptomatic treatment with topical anti-inflammatory agents (e.g., flurbiprofen) such as lozenges and sprays, local anaesthetic therapy, gargles, and oral analgesia (Figure 1) [54, 58, 63, 64, 70, 75, 95]. Despite the clinical emphasis on conservative symptom management to bolster antimicrobial stewardship, primary care practitioners must exercise high vigilance for clinical 'red flags' indicative of severe suppurative or non-suppurative complications [5, 8, 53, 79]. Expedited specialist referral or hospital admission is mandated for patients demonstrating rapid clinical deterioration, severe systemic toxicity, signs of sepsis, impending airway compromise, or deep neck space infections such as peritonsillar or retropharyngeal abscesses (Figure 1) [5, 8, 53, 79].



280

281 **Figure 1:** Treatment algorithm for the management of acute sore throat.

282 ENT: Ear, Nose, Throat; GAS: group A *Streptococcus*; POCT: point-of-care testing.

283

DISCUSSION

A total of 12 consensus statements and a targeted treatment algorithm were developed to guide the optimal management of acute sore throat. The recommendations address the persistent challenge of inappropriate antibiotic use across Southeast Asia and outline evidence-based approaches, emphasising the value of symptomatic treatment as part of antimicrobial stewardship efforts. By establishing a systematic framework for the clinical management of acute sore throat, the Working Group anticipates that optimising adult antibiotic prescribing will directly advance the strategic objectives of the World Health Assembly's Global Action Plan on Antimicrobial Resistance, thereby mitigating a critical global health crisis [99].

The persistently high rates of inappropriate prescribing in the region highlight an urgent clinical need to transition toward objective diagnostic algorithms [12-16, 18-24]. This shift in practice is imperative because overprescription is heavily driven by public misconceptions regarding viral aetiology [26-30, 32, 33] that inflate patient demand [34], alongside diagnostic uncertainty that frequently prompts practitioners to initiate unwarranted empiric therapies [35, 37, 38]. By adopting evidence-based prescribing practices, clinicians can help mitigate the downstream consequences of inappropriate antibiotic use, specifically the acceleration of AMR [42, 43] and the needless exposure of patients to iatrogenic complications [39-41]. Ultimately, curbing this widespread clinical misuse is essential to alleviate the substantial financial burden concurrently imposed on healthcare infrastructures [40].

Translating these findings into routine clinical practice to mitigate diagnostic uncertainty requires practitioners to adopt validated and evidence-based diagnostic algorithms. One optimal tool is the McIsaac score because it is specifically tailored for primary care populations [46, 47]. For patients stratified with having a moderate-to-high probability of GAS infection (a McIsaac score of 3 or 4), clinical pathways must integrate POCT to ensure diagnostic precision and restrict antimicrobial therapy exclusively to confirmed bacterial cases [53]. In fact, a recent meta-analysis of eight RCTs found that POCT reduced antibiotic prescribing for GAS by 38% compared with standard care (RR 0.62, 95% CI

309 0.50–0.77) [100]. Among available POCT options, RADT remains the preferred modality due to their
310 robust sensitivity, specificity and rapid turnaround times [50, 51, 82]. However, the widespread
311 operationalisation of POCT across Southeast Asia remains significantly hampered by financial barriers
312 and temporal constraints in clinical practice [45].

313 To address limited access to POCT, health systems should consider multifaceted strategies, including
314 expanding the role of community pharmacists and utilising risk-stratified clinical management
315 approaches when testing is unavailable [101, 102]. First, health systems should prioritise cost-
316 reduction strategies and targeted awareness campaigns to promote the uptake of POCT as a tool for
317 antimicrobial stewardship [102, 103]. Second, task-shifting appears to offer a practical and potentially
318 cost-effective alternative as physician-led POCT may not always be economically viable [102, 104].
319 Involving community pharmacists in performing POCT and managing uncomplicated cases may be
320 effective, provided this is supported by adequate training, clear safety-netting, and ongoing
321 programme oversight [102, 104]. Finally, in resource-constrained settings where POCT is entirely
322 inaccessible, risk-stratified empiric treatment approaches may be necessary to guide clinical
323 management [101].

324 The application of these consensus recommendations should be tailored to regional disease burdens
325 and local healthcare needs. A World Health Organization (WHO) report emphasises that acute
326 rheumatic fever and rheumatic heart disease are largely shaped by socioeconomic and environmental
327 conditions, particularly poverty, undernutrition, overcrowding, and inadequate housing [105].
328 Therefore, the disease remains concentrated in low- and middle-income settings, where these risk
329 factors are still common. The burden decreases markedly as living conditions improve, with age-
330 standardised prevalence of rheumatic heart disease reported to be very low in high-income settings
331 (around 3.4 per 100,000) compared with much higher levels in lower-income settings (approximately
332 444 per 100,000) [106]. Within Association of Southeast Asian Nations (ASEAN) countries, this gradient
333 is reflected in variable risk profiles. In high-income settings, the risk of acute rheumatic fever is

generally negligible, and clinical management tends to prioritise antimicrobial stewardship over disease prevention. In moderate-risk settings without POCT, antibiotic use is usually guided by validated clinical scoring systems such as the McIsaac score, aiming to avoid overprescribing while maintaining diagnostic safety. In contrast, prevention of acute rheumatic fever becomes the primary clinical priority in high-risk endemic areas. Guidelines in these contexts often recommend a lower threshold for antibiotic use, including POCT where available, or empiric treatment of acute sore throat when testing is not feasible, with the aim of minimising missed streptococcal infections and preventing severe sequelae.

Acute sore throat is predominantly a self-limiting pathology, characterised by symptom trajectories that typically peak within 3 to 5 days and spontaneously resolve by day 10, independent of bacterial or viral aetiology [5, 8, 89]. Pain alleviation constitutes the primary patient-centred outcome [58-71], meaning patients explicitly requesting antibiotics are frequently expressing an unmet need for symptom relief [78]. Furthermore, antibiotic therapy shortens symptom duration by only approximately 16 hours [77]. Effective symptomatic management may therefore help address patient discomfort while potentially reducing expectations for, and unnecessary use of, antibiotics. The prompt initiation of localised symptomatic therapies, specifically topical NSAIDs, delivers targeted, rapid, and durable analgesia with a superior risk-benefit profile characterised by minimised systemic absorption compared to their oral counterparts [72, 94, 95]. While effective symptomatic management can help safely reduce unnecessary antibiotic use, clinicians should remain vigilant to warning signs or persistent symptoms that warrant clinical re-evaluation and expeditious specialist referral [5, 8, 53, 79].

This consensus statement has limitations that should be considered. The panel was composed predominantly of otolaryngologists, and perspectives from other healthcare professionals involved in the management of acute sore throat (e.g., pharmacists) may be underrepresented. Additionally, the panel did not include experts from all Southeast Asian countries, with Cambodia, Laos, and Myanmar

being unrepresented. Finally, statements in this study were derived from a literature search that was confined to a single database, potentially omitting relevant regional studies.

Despite these limitations, this consensus provides practical guidance for healthcare providers, who remain the cornerstone of antimicrobial stewardship by judiciously restricting antibiotics to clinically confirmed cases. Doing so requires strict adherence to the fundamental tenets of optimal prescribing to ensure the right patient receives the correct antibiotic at the appropriate time with the optimal dosing and duration [107-109]. To sustainably counteract the trajectory of AMR, broad-scale educational initiatives must employ a synergistic, two-pronged strategy that reinforces adherence to validated clinical and treatment guidelines among practitioners while systematically dismantling public misconceptions regarding the utility of antibiotics and promoting the efficacy of symptomatic therapies [110]. Through this coordinated effort to align provider practice with patient expectations, healthcare professionals and the public can work together to reduce inappropriate antibiotic use.

CONCLUSION

This consensus establishes a regionally harmonised, evidence-based framework to optimise the management of acute sore throat in adults across Southeast Asia. The recommendations emphasise objective risk stratification using the McIsaac score, supplemented by targeted point-of-care testing where available, to support appropriate antibiotic prescribing. Furthermore, prioritising rapid and effective symptomatic relief, particularly through localised NSAIDs, directly addresses the discomfort that frequently drives the demand for unnecessary antibiotics. Ultimately, the adoption of these recommendations has the potential to strengthen antimicrobial stewardship while supporting evidence-based clinical practice across diverse healthcare settings in Southeast Asia.

LIST OF ABBREVIATIONS

AMR: Antimicrobial resistance

ASEAN: Association of Southeast Asian Nations

BD: Twice daily

CDC: Centers for Disease Control and Prevention

CI: Confidence interval

COVID-19: Coronavirus disease 2019

CPG: Clinical practice guidelines

CREDES: Conducting and Reporting Delphi Studies

ENT: Ear, nose, throat

ESCMID: European Society of Clinical Microbiology and Infectious Diseases

GAS: Group A Streptococcus

GP: General practitioner

ICD-10: International Classification of Diseases, 10th edition

IDSA: Infectious Diseases Society of America

IM: Intramuscular

MeSH: Medical Subject Headings

MU: Million units

NA: Not applicable

NAG: National antibiotic guidelines

NICE: National Institute for Health and Care Excellence

NSAIDs: Non-steroidal anti-inflammatory drugs

OD: Once daily

POCT: Point-of-care testing

QID: Four times daily

RADT: Rapid antigen detection testing

RCTs: Randomised controlled trials

RDU: Rational drug use

RR: Relative risk

Stat: Immediately

TDS: Three times daily

URTI: Upper respiratory tract infection

USD: United States dollar

WHO: World Health Organization

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Consent for publication: Not applicable.

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