



Expert consensus-based clinical recommendation for an integrative anthroposophic treatment approach to acute tonsillitis in childhood

Rebecca Büttner^{a,b}, Melanie Schwermer^{a,b,*}, Thomas Ostermann^c, Alfred Längler^{a,b}, Tycho Zuzak^{a,d}

^a Department of Pediatrics, Gemeinschaftskrankenhaus Herdecke, Germany

^b Integrative Pediatrics, Witten/Herdecke University, Faculty of Health, Germany

^c Department of Psychology, Chair of Research Methodology and Statistics in Psychology, Witten/Herdecke University, Germany

^d Faculty of Medicine, University of Duisburg-Essen, Germany

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ABSTRACT

Background: Medical guidelines are an important basis for qualitative and cost-effective patient care. However, there is a lack of clinical recommendations in anthroposophic medicine (AM), an integrative medicine approach frequently practised in Europe. Acute tonsillitis, which includes tonsillopharyngitis, is a common childhood disease, that is mostly caused by a viral infection. Symptomatic treatment is therefore of high importance, and AM can offer several therapy options.

Methods: 53 physicians from Germany, Spain, Netherlands, Switzerland, Austria, and Hungary with at least one year of experience in anthroposophic paediatric medicine were invited to participate in an online Delphi process. The process comprises five survey rounds starting with open-ended questions and ending with final statements, which need 75% agreement of experts to reach consensus. Expert answers were evaluated by two independent reviewers using MAXQDA and Excel.

Results: Response rate was between 28% and 45%. The developed recommendation included 15 subtopics. These covered clinical, diagnostic, therapeutic and psychosocial aspects of acute tonsillitis. Six subtopics achieved a high consensus (>90%) and nine subtopics achieved consensus (75–90%).

Conclusion: The clinical recommendation for acute tonsillitis in children aims to simplify everyday patient care and provide decision-making support when considering and prescribing anthroposophic therapies. Moreover, the recommendation makes AM more transparent for physicians, parents, and maybe political stakeholders as well.

1. Introduction

Acute tonsillitis (including acute tonsillopharyngitis, acute pharyngitis) is common in childhood and is therefore a common reason for acute medical consultation.^{1–3} In most cases, it is caused by virally induced inflammation of the palatine tonsil.⁴ In the case of a bacterial genesis, the most commonly bacteria are group A Streptococcus (GABHS).⁴ Characteristic symptoms are sudden onset of sore throat with or without difficulty swallowing, fever and malaise. Clinical symptoms include enlargement of tonsils with presence of plaque and hyperemia as well as enlargement of cervical lymph nodes.^{3,5}

Despite the mostly viral etiology of acute tonsillitis, in which symptomatic treatment is indicated, prescription of antibiotics is frequent. This unnecessary prescription of antibiotics is particularly problematic because antibiotic resistance due to overprescription is an important issue.^{3,6,7} Moreover, repeated antibiotic use has negative effects on the intestinal microbiota causing inter alia obesity.⁸

Complementary, alternative and/or integrative medicine (CAIM) includes therapeutic approaches that are used in addition to or instead of conventional medicine.^{9,10} A relevant percentage of parents want CAIM therapy for their children.^{11,12} Different CAIM therapies for the treatment of acute tonsillitis can be found in the literature. Herbal medicine

* Correspondence to: Department of Pediatrics, Gemeinschaftskrankenhaus Herdecke, Gerhard-Kienle-Weg 4, 58313 Herdecke, Germany.

E-mail address: M.Schwermer@gemeinschaftskrankenhaus.de (M. Schwermer).

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in particular has been repeatedly examined in the context of childhood tonsillitis therapy.^{11,13,14} Use of anthroposophic medicine for acute tonsillitis was investigated in a prospective observational comparison study including pediatric patients with acute respiratory or ear infection by Hamre et al. The authors demonstrated a significant reduced prescription of antibiotics and fewer analgesics while showing quicker symptom resolution and higher caregiver satisfaction.¹⁵

Anthroposophic medicine (AM) is a frequently practiced CAIM therapy which is used particularly in Central Europe, mostly in Germany and Switzerland.¹⁶ It was introduced in 1920 by Dr. Rudolf Steiner and Dr. Ita Wegmann and aims to expand and supplement conventional medicine. Utilizing a holistic treatment approach, AM aims to consider the whole person with their physical, living, mental and spiritual dimensions as well as their personal biography.¹⁷ In Germany and Switzerland, some AM treatments are reimbursed by health insurances. The German hospitals *Gemeinschaftskrankenhaus Herdecke* and the *Filderklinik* (Filderstadt) have departments for paediatric integrative medicine that practice AM.¹⁸ These two pediatric departments treat an average of 3000 pediatric inpatients per year.¹⁹

Clinical recommendations and guidelines are a valuable support of clinical work - this also applies to AM. The clinical experience of the treating physician serves as the basis for the application of AM. Such experiences are summarized in the *Vademecum* of anthroposophic medicine. Herein indication, recommendation and other important information for more than 600 anthroposophic medicine products are described. The information based on questionnaires (experience reports) that physicians can fill on their own initiative or analysis of experience reports.²⁰ Evidence- or consensus-based recommendations, especially for children, are still missing. Therefore, we developed an expert consensus-based clinical recommendation for an integrative anthroposophic treatment of acute tonsillitis in childhood with the goal of making AM more transparent for parents, physicians and stakeholders.

2. Methods

The aim of the project was to consult anthroposophic physicians, guide them through an online-based Delphi process and generate clinical recommendations for AM treatment of acute tonsillitis in children.^{21,22}

2.1. Pool of experts

The pool of experts was made up of 53 physicians with at least one year of experience in pediatric AM. German physicians from the pediatric departments of the *Gemeinschaftskrankenhaus Herdecke* (GKH; n = 11), the *Filderklinik* (n = 11) as well as practicing paediatricians (n = 25) were invited. Some German-speaking physicians from other European countries were also contacted (Spain n = 1, Austria n = 1, Switzerland n = 2, Hungary n = 1, Netherlands n = 1).

2.2. Delphi Process

The Delphi process was developed in 1963 and is a systematic, multi-stage survey procedure with the goal of developing a consensus-based opinion of experts.^{23,24} To create the recommendation presented here, a Delphi process with five survey rounds was carried out, starting with open-ended questions and ending with consensus-scoring (Fig. 1). The UniPark online survey tool (www.unipark.com) was used for the anonymous expert questioning.

In the first round, experts received a questionnaire with six open-

ended questions that covered the following subsections:

1. Disease course
2. Pathogenesis
3. Diagnostics
4. Therapies
5. Chances and risks
6. Interaction between the physicians, children and parents

The data was qualitatively analysed, and answers were thematically clustered according to the following topics:

1. Important factors in the pathogenesis of tonsillitis
2. Spectrum of pathogens
3. Symptoms of tonsillitis
4. Accompanying symptoms of tonsillitis
5. Inspection and physical examination
6. Relevant diagnostic procedures
7. Disease course
8. The most important principles in anthroposophic extended therapy
9. Anthroposophic therapies for external use
10. Anthroposophic gargle therapies
11. Anthroposophic medication
12. Antibiotic therapy
13. Possible positive aspects of tonsillitis
14. Risks of tonsillitis
15. Aspects of interaction and counselling between physician and the child's parents during consultation

In addition to the main topics mentioned above and all answers given in the first round, a second round of questions was sent to the experts. The experts were required to rank the statements that best represented their clinical opinion by a drag-and-drop function.

The resulting data was quantitatively analyzed and only answers chosen by > 50% of physicians were used for the expert clinical recommendation.

In the third round, the experts received a first draft of the recommendation. They were then required to agree or disagree on the individual topics. Topics which did not receive > 75% agreement were revised and sent out again for another round of voting, which constituted the 4th and 5th round of the Delphi process.

2.3. Consensus assessment

The consensus was evaluated according to the ESPEN (European Society for Clinical Nutrition and Metabolism) classification for strength of consensus (Table 1).²⁵ If a section received ≤ 75% approval, it was modified based on the justifications for disagreement given by the experts and then sent out again. This process was repeated until a consensus of > 75% was reached (Table 1). Therefore, at the end of the survey, all experts agreed with each of the sub-items with a consensus of > 75%. The German Association of the Scientific Medical Societies (AWMF) has developed a system of guidelines that classifies guideline development into four levels and ranks them from S1 to S3, with S3 being the highest quality level of the development methodology. Based on this ranking, our guideline can be classified as an S2k guideline, since it contains experts who were involved in the development of the guideline, it is based on a Delphi process, and it was subject to a structured consensus finding.²⁶

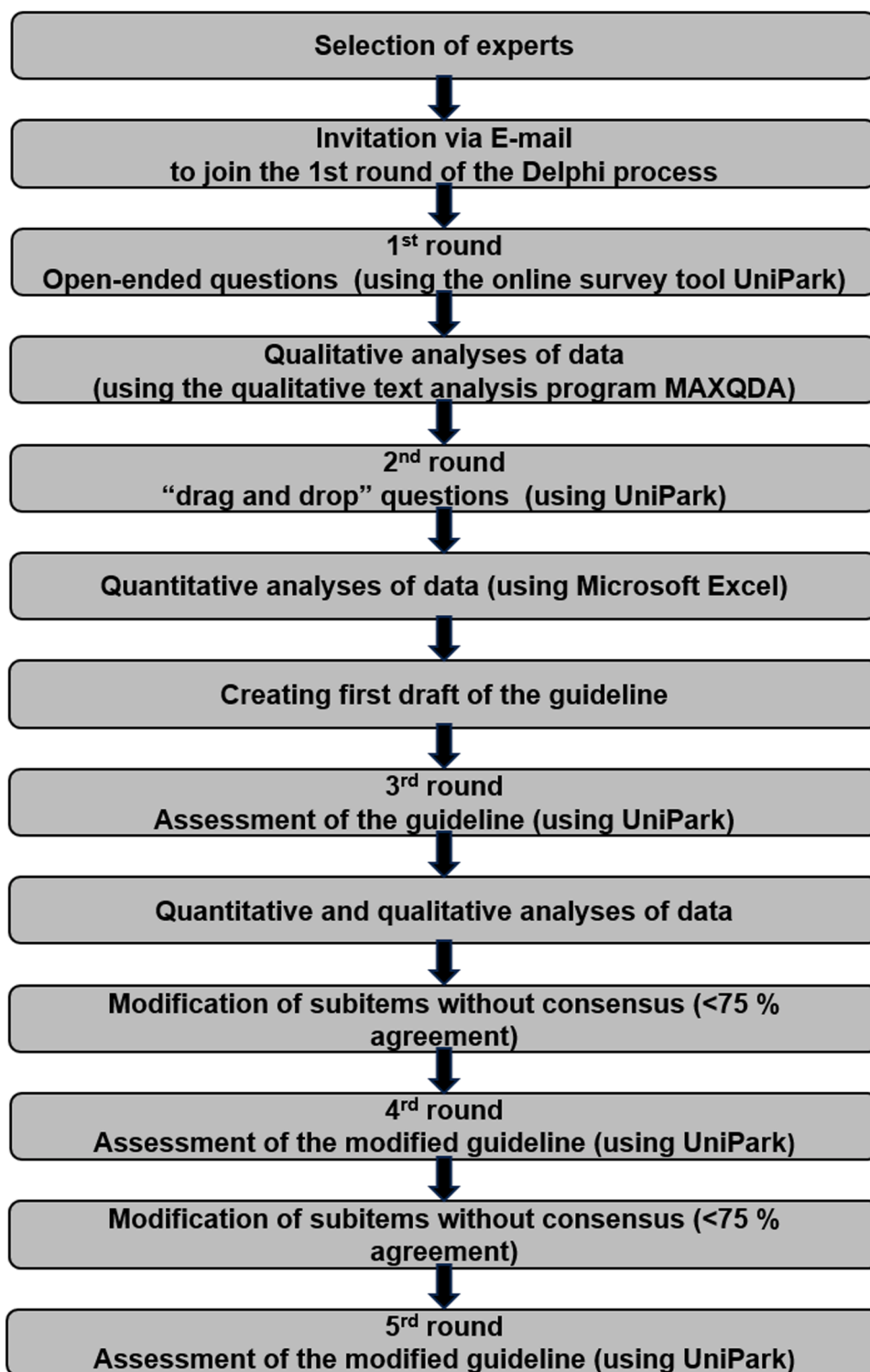


Fig. 1. Development process of the consensus-based treatment guideline using the Delphi process.

Table 1

ESPEN classification for the strength of consensus (Table modified from²⁵).

Agreement of experts	Assessment
> 90%	Strong consensus
> 75–90%	Consensus
> 50–75%	Majority agreement
< 50%	No consensus

2.4. Data analysis

After the first round, expert answers to open-ended questions were analysed by two independent reviewers using MAXQDA, a software for qualitative data analysis.

If different ratings were given by the two independent reviewers, a third reviewer was consulted. The answers to drag-and-drop questions were evaluated quantitatively using Excel.

2.5. Ethical approval

The ethics application for this survey was approved by the ethics commission of the University of Witten/Herdecke (179/2016).

3. Results

3.1. Response rate

Of the 53 contacted experts, 36% (N = 21) took part in the first round. Expert participation in the second round was 28% (N = 16) and 40% (N = 23) experts responded in the third round. The fourth (29%; N = 17) and fifth (45%; N = 26) round were used for re-consensus voting on diagnostic, disease progression, antibiotic therapy. In each round, the same cohort of 53 experts was contacted.

3.2. Development of treatment recommendation

Five survey rounds were required to create a clinical treatment recommendation with 15 subsections, which are shown in Fig. 2. A strong consensus (>90%) was reached for 40% of the topics (N = 6) and consensus (>75%) was received for the remaining 60% (N = 9) of topics. All experts agreed on the topics regarding antibiotic therapy and possible positive aspects of tonsillitis in childhood. A strong consensus was also observed for the following categories: “the spectrum of pathogens” (91% consensus), “relevant diagnostic procedures at physician’s consultation” (93% consensus), “anthroposophic gargle therapies” (91% consensus) and “aspects of interaction and counselling between physician and child’s parents during consultation” (96% consensus). The remaining topics reached a consensus of > 75–90% and are as follows: “important factors in the genesis of tonsillitis”, “specific symptoms of tonsillitis”, attendant / secondary symptoms of tonsillitis, inspection and physical examination, disease progression, the most important principles of anthroposophic therapy, anthroposophic therapies for external use, anthroposophic medication, risks of tonsillitis in childhood.

3.3. Consensus-based clinical recommendation for the treatment of tonsillitis in children

The results of the Delphi process contain a consensus-based recommendation for supplemental anthroposophic therapies as well as helpful

facts regarding the clinical picture, diagnostic procedure and counseling about tonsillitis in childhood. Within each subject area, the subsections are listed according to their relevance. A German version of the clinical recommendation was also prepared. This is attached to the text as a supplement.

Important factors in the pathogenesis of tonsillitis (83% consensus):

1. Exhaustion after mental stress and excessive demands
2. Predisposition to tonsillitis
3. High emotional sensitivity
4. Being subjected to too many external stimuli
5. Previous exposure to cold temperatures
6. Preceding antibiotic therapy
7. Previous upper respiratory infection

Spectrum of pathogens (91% consensus):

Tonsillitis is caused by viruses, group A beta-hemolytic streptococci (*Streptococcus pyogenes*) or other bacteria.

Specific symptoms of tonsillitis (87% consensus):

1. Difficulty swallowing
2. Sore throat, painful enlargement of tonsils
3. Hyperaemia of tonsils with or without presence of plaque
4. Enlargement of cervical lymph nodes painful to palpation
5. Fever with high temperature
6. Palatal petechiae
7. Difficult throat breathing

Accompanying symptoms of tonsillitis (87% consensus):

1. Drinking and eating weakness
2. Stomach pain
3. Halitosis
4. Tiredness, malaise
5. Coated tongue
6. Pale mouth-nose triangle
7. Headache
8. Difficulty opening the mouth
9. Rhinitis
10. Nausea and vomiting

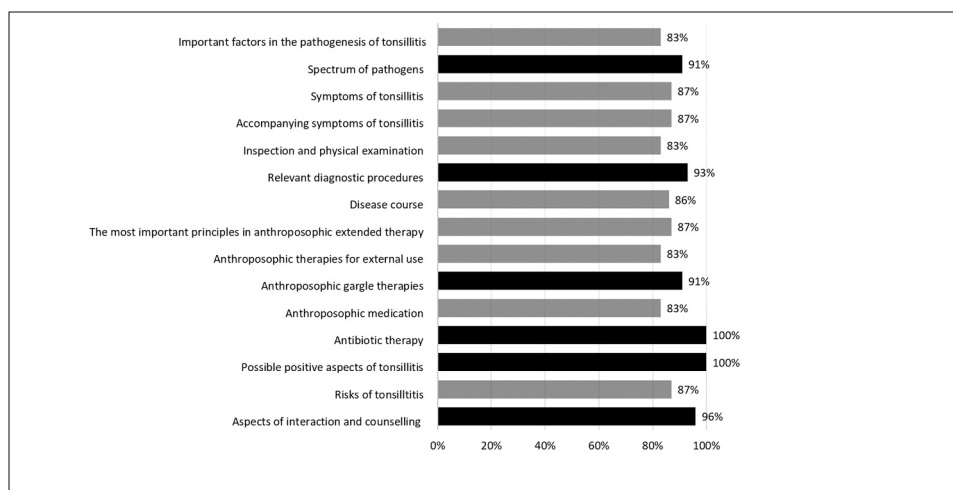


Fig. 2. Final consensus assessment score of the guideline. Subitems with strong consensus (>90%) and consensus (> 75–90%) are indicated by black bars and grey bars, respectively.

11. Exanthema

Inspection and physical examination (83% consensus):

1. Inspection of the throat
2. Palpation of the cervical lymph nodes
3. Physical examination (assessment according to McIsaac Score/modified Centor Score)
4. Smell: the foetor ex ore is specific for tonsillitis
5. Inspection of the skin
6. Inspection of the neck
7. Abdominal palpation to rule out hepatosplenomegaly

Relevant diagnostic procedures at physician's consultation (93% consensus):

1. Recording of past medical history pertaining to acute tonsillitis
2. Physical examination
3. Temperature measurement
4. Rapid test for β-hemolytic streptococci (GABHS rapid test) to determine necessity of antibiotic use
5. If the findings are unclear, a microbiological culture of β-hemolytic streptococci should be taken
6. If it is unclear whether an EBV infection is present, EBV serology is recommended

Disease course (86% consensus):

1. In the case of viral genesis, the symptoms subside after 3-5 days
2. The acute course usually shows an early spike in temperature (>39 °C)
3. Full recovery usually occurs after a week at the earliest.

The most important principles in integrative anthroposophic therapy (78% consensus):

1. Anthroposophic medication
2. Anthroposophic therapy for external use
3. Warm feeds
4. Gargle therapies

5. Rest
6. Keeping the neck warm
7. Shielding from external stimuli
8. Sufficient drinking, preferably warm drinks
9. Drinking sage tea
10. Antibiotic therapy

Anthroposophic therapies for external use (83% consensus): .

- The **neck compress with lemon** is used to treat a sore throat associated with tonsillitis. It can be applied to children of two years and above. It should be used 1-2 times a day, especially in the morning when symptoms arise (consensus 83%).
- The **neck compress with curd** is indicated for feverish tonsillitis with painful lymphadenitis in children from the age of 3 years. In the acute phase, it should be used at least once a day for around 20 min (consensus 91%).
- The **neck compress with Archangelica comp. salve WELEDA®** is used to treat lymphadenitis and lymphadenopathy in children with tonsillitis, from the 2nd year of life. It should be used 1-3 times a day for about a week (consensus 96%).
- **Warm foot baths** with lavender, lemon, ginger flour, or mustard flour are used to treat cold feet of children older than 2 years suffering from tonsillitis. Warm foot baths should be used 1-3 times a day, at the beginning of the disease and especially in the evening hours (consensus 83%).

Anthroposophic gargle therapies (91% consensus):

- The gargle treatment with Bolus Eucalypti comp. WELEDA® is used for children with sore throat associated with tonsillitis. The treatment can be used for children from preschool age onwards* . One teaspoon is given at least 3 times a day for as long as the symptoms persist (consensus 100%).
*Package leaflet: For children 6 years and older as soon as they can gargle safely.
- The gargle treatment with sage tea is used for children with tonsillitis suffering from throat and swallowing problems from the ages of 4-6 years. It should be used at least 3 times a day for the full duration of symptom persistence (consensus 91%).

Table 2
Recommendation of anthroposophic medications.

	Medication	Indication and effect	Dosage	Application duration	Consensus
Sore throat	Echinacea mouth and throat spray WALA®	Tonsillitis with sore throat	≥ 4 years; ¹ at least three times a day 1-2 sprays in the mouth	for 3 days and if the symptoms persist	83%
Sore throat + Fever	Apis Belladonna, Globuli velati WALA®	Feverish tonsillitis without lymphadenitis	In any age; ² (depending on age), 3-5 times a day, 3-10 globules	acute phase of the disease and for at least one week	93%
	Apis/Belladonna cum mercurio Globule, velati WALA®	Feverish tonsillitis, especially with purulent plaques and with lymphadenitis	In any age; ² 3-5 times a day, 3-10 globules (depending on age) should be used	for at least 3 days and if symptoms persist	87%
Sore throat+ sinusitis+ hoarseness	Zinnober comp. Trituration WELEDA®	Feverish tonsillitis with purulent plaques with lymphadenitis	≥ 3 years (in special cases <3 years ³). At least 4 times a day, One knife tip.	approximately a week	97%
	Pyrit Zinnober tablet WELEDA®	Tonsillitis with accompanying hoarseness and possible sinusitis	≥ 2 years. 3-6 times a day, 1-2 tablets.	1-2 weeks	91%

¹Package leaflet: Echinacea mouth and throat spray must not be used in children under 4 years of age

²Package leaflet: for infants, children and adults, no age restriction

³Package leaflet: children under 3 years of age should use Zinnober comp. received only on the prescription of a doctor and in the dosage specified by the doctor

Package leaflet: not indicated in infants in the first year of life.

Anthroposophic medication (83% consensus):**Antibiotic therapy (100% consensus):**

Since tonsillitis is usually a viral disease, antibiotic therapy is not routinely recommended.

The indication for antibiotic treatment of tonsillitis in children should therefore be critically evaluated and used in accordance with current clinical guidelines.

Possible positive aspects of tonsillitis in childhood (100% consensus):

1. Fever to strengthen the immune system
2. Self-healing processes are activated by the disease
3. Rest can increase reconvalescence

Risks of tonsillitis in childhood (87% consensus):

1. Recurrent courses
2. Peritonsillar abscess
3. Missing an Epstein-Barr infection
4. If antibiotics are used frequently, the risk of recurrence is high

Aspects of interaction and counselling between physician and child's parents during consultation (96% consensus):

1. It is important to treat parents and children with respect and to be friendly
2. As the treating physician, project confidence in dealing with the disease
3. Communicate the importance of rest for the child to the parents
4. Communicate that recovery without antibiotic therapy is possible even with a febrile disease course and that the risk of recurrence is reduced as a result
5. Inform parents about the usually mild clinical picture
6. Discuss how to deal with illness, fever and malaise experienced as a result of the acute tonsillitis

4. Discussion

Guidelines are an important tool used in medicine, including in paediatrics, since they can improve the quality of patient care and reduce costs. A variety of guidelines are available in paediatrics in Germany.²⁷ To use AM in paediatrics in a scientifically sound manner and to create more transparency for parents and health insurance companies, it is of great importance to create guidelines in anthroposophic paediatrics. Even though there is high patient demand, trials or official guidelines on AM therapy for tonsillitis in children are missing. AM therapies are used in Germany both in an outpatient and an inpatient setting in the departments for paediatrics of the German anthroposophic hospitals *Gemeinschaftskrankenhaus Herdecke* and *Filderklinik*.¹¹ It still presents a common problem that patients actively using CAIM often do not talk with their treating physician about CAIM options.^{11,28} On the other side physicians are not able to adequately advise patients about CAIM.²⁹ This underscores the urgency of treatment recommendations for physicians to improve patient counseling and education about CAIM.

The aim of this study was to create a clinical recommendation for the AM treatment of tonsillitis in children. Since there are no trials on this treatment, it was not possible to create an evidence-based guideline. A multistep, online expert survey (Delphi process) was therefore used to establish consensus-based recommendations for the AM treatment of tonsillitis in children.

These recommendations are intended not to replace but to complement the existing conventional treatment regimens and is aimed at both anthroposophic and non-anthroposophic physicians who work in hospitals or outpatient care in pediatrics.

Our recommendation also contains facts about disease

characteristics, diagnostic and conventional treatment to present a complete overview of the disease. These facts are consistent with data of existing guidelines, as expected. Spectrum of pathogens are also in line with epidemiological data.^{2,4}

Especially in AM, the individual is of great importance and so the guideline should not replace the individual therapy decision of the treating physicians. Nevertheless, since the survey resulted in high consensus values (a strong consensus (>90%) was reached for 40% of the topics), the clinical recommendation can serve as a basis for decisions in anthroposophic treatment in everyday practice. Clinical recommendations for childhood gastroenteritis and bronchitis have already been drawn up, and are currently being implemented and prospectively evaluated.^{30,31} These studies are underway in the children's department of the *Gemeinschaftskrankenhaus* in Herdecke and the same implementation is also intended for the guidelines presented here regarding the therapy of acute tonsillitis in childhood. The clinical implementation and the prospective evaluation of the existing recommendations for bronchitis and gastroenteritis underscore the applicability of the treatment recommendation.

The experts found a consensus on the cause, diagnostics, therapy, aspects of interaction and counselling between physician and child's parents and anthroposophic aspects of tonsillitis in children with five rounds of online surveys. Of the 53 invited experts, a minimum of 28% (N = 16) and a maximum of 45% (N = 26) of the experts took part in these rounds. They found a consensus for more than 83% of presented therapies (remedies, external application, and gargle therapies).

All medications recommended in this guideline are authorized by the federal institute for drugs and medical devices (BfArM) in Germany and can be prescribed by every physician. This makes our recommendation highly applicable in everyday clinical practice.

In summary, the guideline presented here contributes to the scientific elaboration of AM in pediatrics and makes the approach of AM physicians more transparent for parents, stakeholders and physicians.

Nevertheless, further studies on anthroposophic therapy for tonsillitis in childhood, especially controlled clinical trials, are needed, to develop a guideline with a higher evidence-level.

5. Limitations

The Delphi process has also same limitation. The assessments and the statements reflect the knowledge and opinions of a selected group of physicians. For example, two experts disagree to the statement "Tonsillitis is caused by viruses, group A beta-hemolytic streptococci (*Streptococcus pyogenes*) or other bacteria" which is scientifically correct. One expert did not comment its disagreement and the other one stated that bacteria are not the trigger but aggravated the disease. The statement "If antibiotics are used frequently, the risk of recurrence is high", which 87% of the experts agreed with, cannot be proven by scientific studies. The qualitative analysis of the answers and the summarizing of the expert information by our reviewers be biased. A software tool (MAXQDA) was used to qualitatively analyse the data and counteract this bias and two independent reviewers were included in the evaluation. The low participation rate of the surveyed cohort (maximum N = 26) must also be mentioned as a limitation. Moreover, some of the experts are also from the same department and therefore might use similar therapy regimes. Due to anonymity of the Delphi process, it was also not possible to determine the number of participating experts outside of Germany. Although the guideline is intended to be applied internationally, it must be noted that it represents the opinion of predominantly German physicians and may not be implemented in all regions of the world. We are also aware that anthroposophic medicines are not always available, especially in developing countries.

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Author statement

All authors confirm that they have seen and approved the final version of the manuscript “Expert consensus-based clinical recommendation for an integrative anthroposophic treatment of acute tonsillitis in childhood”.

The authors ensure that the article is the authors’ original work, has not received prior publication and is not under consideration for publication elsewhere.

Moreover, the authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

CRedit authorship contribution statement

Tycho Zuzak: Writing – review & editing, Project administration, Methodology, Funding acquisition, Conceptualization. **Thomas Ostermann:** Methodology. **Alfred Längler:** Writing – review & editing, Supervision. **Rebecca Büttner:** Writing – original draft, Investigation, Formal analysis, Conceptualization. **Melanie Schwermer:** Writing – review & editing, Project administration, Methodology, Conceptualization.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Tycho Zuzak reports financial support was provided by Mahle Foundation. Tycho Zuzak reports financial support was provided by Christophorus Foundation.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.ctim.2024.103031](https://doi.org/10.1016/j.ctim.2024.103031).

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