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Expert consensus-based clinical recommendation for an integrative anthroposophic treatment of acute bronchitis in children: A Delphi survey

Pilar Marie Wopker [a,b], Melanie Schwermer [a,b,*], Simon Sommer [c], Alfred Längler [a,b], Katharina Fetz [d], Thomas Ostermann [d], Tycho Jan Zuzak [a,e]

[a] Department of Pediatrics, Gemeinschaftskrankenhaus Herdecke, Gerhard-Kienle-Weg 4, 58313, Herdecke, Germany
[b] Witten/Herdecke University, Faculty of Health, Alfred-Herrhausen-Straße 50, 58455, Witten, Germany
[c] Department of Pediatrics, Vestische Kinder- und Jugendklinik Datteln, Dr.-Friedrich-Steiner-Straße 5, 45711, Datteln, Germany
[d] Department of Psychology, Chair of Research Methodology and Statistics in Psychology, Witten/Herdecke University, Alfred-Herrhausen-Straße 50, 58455, Witten, Germany
[e] Department of Pediatric Oncology and Hematology, University of Duisburg-Essen, Hufelandstr.55, 45147, Essen, Germany

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ABSTRACT

Background: Acute bronchitis is one of the most common pediatric diseases. In addition to conventional therapies, a frequent use of complementary and alternative medicine (CAM) has been stated. Anthroposophic medicine (AM) is one of the most practiced complementary and integrative medicine (CIM) approaches in Central Europe but hitherto no consensus-based clinical recommendations or guidelines are available.
Therefore, a consensus-based recommendation leading to an informed and reasonable use of AM in the treatment of acute bronchitis in pediatrics was developed.
Methods: A total of 61 physicians in Germany with expertise in the field of anthroposophic pediatrics was invited to complete an online multistep Delphi process. Two independent reviewers quantitatively and qualitatively evaluated the results. The survey was completed when >75 % consensus was achieved.
Results: The clinical recommendation comprises 15 subitems related to treatment as well as clinical and psychosocial aspects. All items reached strong consensus (>90 %; N = 9) or consensus (75–90 %; N = 6).
Conclusion: The comprehensive clinical recommendation creates a scientific base for the anthroposophic integrative treatment of acute bronchitis in children in Germany. It will make the anthroposophic approach more applicable, understandable and comparable to a wider public of physicians and other health professionals in Germany.

1. Background

Acute bronchitis ranks among the most common diseases in pediatrics and is one of the most frequent reasons leading to hospital admission.[1] Depending on the clinical course of the disease, characteristic symptoms are coughing, respiratory rales, wheezing in case of obstruction as well as fever and dyspnea.[2] In up to 95 % of cases,[3] the inflammation of the mucous membrane of the bronchi, as an infection of the lower airway, is viral-caused.[3,4] Therefore, the treatment is mainly symptom-based and the use of antibiotics is generally not indicated. Conventional medicine applies β_2 agonists (e.g. salbutamol) to ease obstruction and antibiotics in case of a bacterial infection, which mainly occurs as a superinfection subsequent to a viral cause.[2]

Previously conducted reviews show that diverse CAM therapies are used in the treatment of respiratory tract infections [5,6] and specifically in acute bronchitis.[7]

AM is one of the frequently practiced and well accessible CIM approaches in Central Europe and especially in Germany and Switzerland.[8–10] It is based on Rudolf Steiner's human science, comprising a wholesome view on the patient and his sickness.[11] The anthroposophic view starts from the idea of a four-level concept of formative forces that shape the human being.[12] Health is a result of balance of those levels. The highest level represents the spiritual core, the individuality of a human being and is to form the other levels. Furthermore, the concept of a three-fold constitution represented by three subitems predominating in certain parts of the body (nerve-sense

* Corresponding author at: 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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system, motor-metabolic system and rhythmic system) contributes to a complex and holistic approach towards a patient and is addressed by AM therapies. Personalized therapy approaches include anthroposophic remedies, external applications as well as moving and creative therapies.[12]

AM has realized the conjunction with conventional medicine and is practiced simultaneously in Western hospitals. It is acknowledged by health insurances in Germany and reimbursed in Switzerland. It is, therefore, broadly accessible to patients in these countries.

There are nine certified anthroposophic hospitals in Germany and one in Switzerland.[13] In addition there are more integrative-working hospitals, which include AM in their concept.[14] Two of the German hospitals, the *Gemeinschaftskrankenhaus Herdecke* (*GKH*) and the *Filderklinik* in Filderstadt, include a pediatric department.[9,10] At the *GKH* averagely 1750 hospitalized pediatric inpatients are treated per year (2006–2015) and about 1245 children are treated at the *Filderklinik*.[10] Amongst all treated patients averagely 178 patients are yearly suffering from bronchitis, of these 139 from acute bronchitis, including obstructive bronchitis.[15,16]

The clinical use of anthroposophic therapies is mainly based on the expertise and advice of experienced anthroposophic physicians, nurses and therapists. There is large individual knowledge, but to make anthroposophic therapies more tangible and accessible for a wider public of physicians and health insurances, a merger of knowledge in the form of clinical recommendations would be helpful and crucial.

In the field of AM some observational studies demonstrate the effectiveness of anthroposophic remedies, in this case mainly ribwort-based, namely WALA Bronchi Plantago in the form of globules, cough syrup and bronchial balm.[17–20] Yet, high quality studies in the form of randomized controlled trials are lacking to provide an evidence base for these preliminary results.

Some randomized controlled studies investigating CAM in the treatment of acute bronchitis already exist in the field of herbal medicine and homeopathy, showing the effectiveness of investigated remedies, e.g. the pelargonium sidoides extract *EPs® 7630* [21–23] and the homeopathic remedy *Monapax®*.[24] A recent meta-analysis additionally revealed the effectiveness of *EPs® 7630*.[25]

A guideline for the anthroposophic treatment of acute gastroenteritis in children has already recently been published.[26] Thus, the aim of this manuscript is to provide clinical recommendation for the anthroposophic treatment of acute bronchitis in children. For this, we used an online-based Delphi process and the recommendation is based on expert consensus.

2. Methods

We conducted an online-based Delphi process to develop a guideline for the anthroposophic treatment of acute bronchitis in children. It is an accepted method in medical research to gain consenting information from a group of experts with diverse experience.[27–29] Moreover, this method previously successfully served for the development of a medical guideline for the anthroposophic treatment of acute gastroenteritis in children.[26]

2.1. Group of experts

A pool of 61 physicians working in Germany with expertise in pediatric AM and at least one year of experience was selected. Physicians working in the pediatric departments of the *GKH* (N = 15) and the *Filderklinik* (N = 9) as well as local physicians working in outpatient care (N = 37) were invited.

Amongst them there are physicians specialized in pediatrics (N = 38) and specialized in internal medicine (N = 14). Moreover, 15 of the physicians are members of the German association of anthroposophic physicians (GAÄD; Gesellschaft Anthroposophischer Ärzte in Deutschland)

2.2. Delphi process

The Delphi process was implemented between December 2017 and August 2019. The anonymous multi-step survey comprised four rounds, starting with open-ended questions and ending with a consensus-scoring assessment of the guideline (Fig. 1). Design and analysis methods were adopted and modified from a recent guideline for the anthroposophic treatment of acute gastroenteritis.[26]

The online Delphi process was conducted using the survey tool Unipark (https://www.unipark.com).

In the first Delphi survey round experts were asked for their opinion to the followings topics:

1 Clinical picture of acute bronchitis
2 Concept/ideology of illness from an anthroposophic point of view
3 Course and severity of the disease
4 Diagnostics
5 Therapies
6 Risks and positive aspects
7 Interaction with child and parents

Responses were qualitatively analyzed and summarized into further categories. Experts received a second survey containing questions to the following issues:

1 Symptoms of acute bronchitis
2 Genesis and emergence of disease

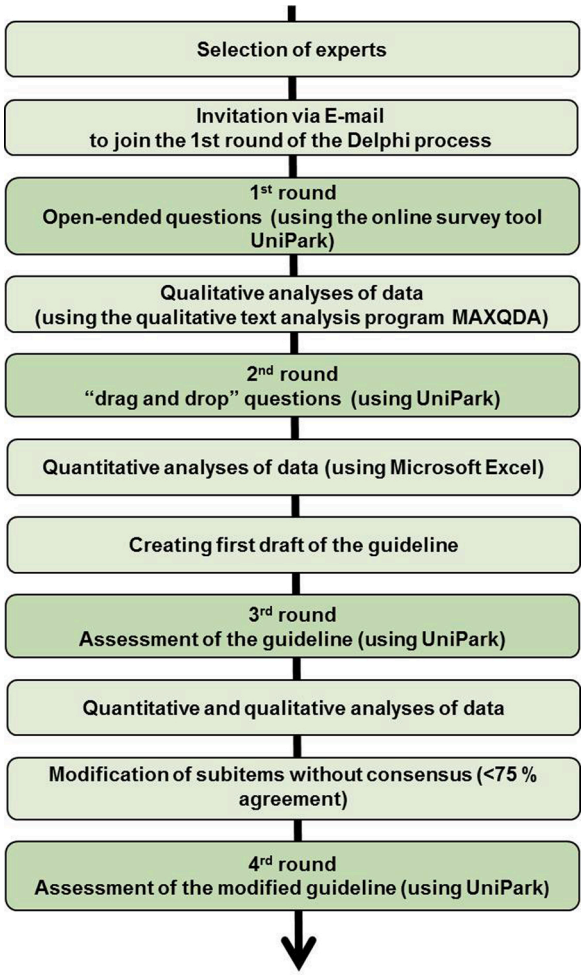

Fig. 1. Development of a consensus-based guideline using a Delphi process (modified 35).

3 Characteristic course of the disease
4 Severity and development of the disease
5 Admission to hospital
6 Diagnostics
7 Anthroposophic drug therapy
8 Application of compresses
9 Inhalation therapy and nose drops
10 Teas
11 General recommendations
12 Conventional and herbal remedies
13 Risks
14 Positive aspects
15 Interaction between physician and child and counseling of parents

In the second round, a list of expert responses of the first round was provided. Experts had to choose the most fitting answer options by a drug and drop procedure.

The complete questionnaires of round 1 and 2 are provided in additional file 1 and 2.

In consideration of the most frequent answers, we developed a guideline and sent it out to the experts for further assessment.

2.3. Consensus assessment

Consensus was assessed according to the ESPEN classification for strength of consensus (Table 1[30]. Consensus was acknowledged when >75 % of the participating experts were in agreement. Items that did not reach 75 % approval were modified and sent out again until a > 75 % consensus was achieved.

2.4. Analysis methods

Two independent reviewers using the software for qualitative data analysis, MAXQDA, analyzed expert answers of open-ended questions. A third reviewer was sought for consent in case of divergent ratings. Further data, e.g. consensus voting, was quantitatively analyzed via use of Excel.

3. Results

3.1. Response rate

In the first round, 26 % (N = 16) of the 61 invited physicians completed the survey. In the second round, a participation of 14.7 % (N = 9) was registered, and in the final consensus-scoring round, a response rate of 37.7 % (N = 23) was achieved.

One recommendation (on anthroposophic drug therapy) did not reach consensus initially. The re-consensus vote was then completed again by 37.7 % (N = 23) of experts.

3.2. Dropout of experts

In the course of the multistep survey, there was a dropout of three experts. The main reason was inaccessibility by email due to relocation of workplace. The final consensus-scoring invitation was successfully sent to 58 participants.

Table 1
ESPEN classification for the strength of consensus [30].

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

3.3. Development of recommendations

The outset was given by seven open-ended questions. Resulting content was qualitatively summarized to statements and experts were invited to choose their priorities. Out of the most frequently chosen answers, a guideline of 15 recommendations concerning disease characteristics, diagnostics, detailed anthroposophic therapies as well as psychological aspects of caretaking, was drawn.

3.4. Consensus vote

The guideline containing 15 items was sent out for a final assessment. Strong consensus (>90 %) of voting physicians (N = 23) was achieved in 60 % (N = 9) of items (Fig. 2). Consensus (75–90 %) was revealed for five items (N = 5). Initially, the recommendation for the anthroposophic drug therapy was only agreed upon by 73.91 % (majority agreement). Therefore, the recommendation was modified according to the voters' remarks and sent out for reassessment, which was then approved by 87 % (consensus) of the participating physicians (N = 23).

3.5. Treatment recommendations

Based on the experts' responses, a guideline for integrative anthroposophic treatment of acute bronchitis was developed and is presented in this manuscript. The order of subitems in each recommendation is random and does not display a ranking.**Most relevant symptoms of acute bronchitis in children (86 % consensus)**

- Cough (dry to productive, may be painful with urge to cough)
- Coarse rattling noises of the lung, accentuated breathing sounds
- Increased mucus production and expectoration
- Obstruction with wheezing sound, may be accompanied by sonorous rhonchus

Common factors in the genesis and emergence of acute bronchitis (91 % consensus)

- Viral infection
- Bacterial infection
- Preceded upper respiratory tract infection, e.g. accompanied by rhinitis
- Influence of cold temperature, e.g. temporary reduction of body temperature (inappropriate clothing in respect to windy, cold and wet weather and during winter months)

Common clinical course of acute bronchitis (100 % consensus)

- Starting with an upper respiratory tract infection
- Duration mostly 3–7 days
- Cough initially often dry, becoming productive with mucus which becomes loosened later in the course of the disease

Criteria for assessing the severity of acute bronchitis (95 % consensus)

- Low peripheral oxygen saturation with additional demand of oxygen
- Degree of reduction of the general condition
- Development of dyspnea
- Presentation of obstruction

Criteria for an inpatient admission (100 % consensus)

- Low peripheral oxygen saturation with additional demand of oxygen
- Tachypnea and dyspnea

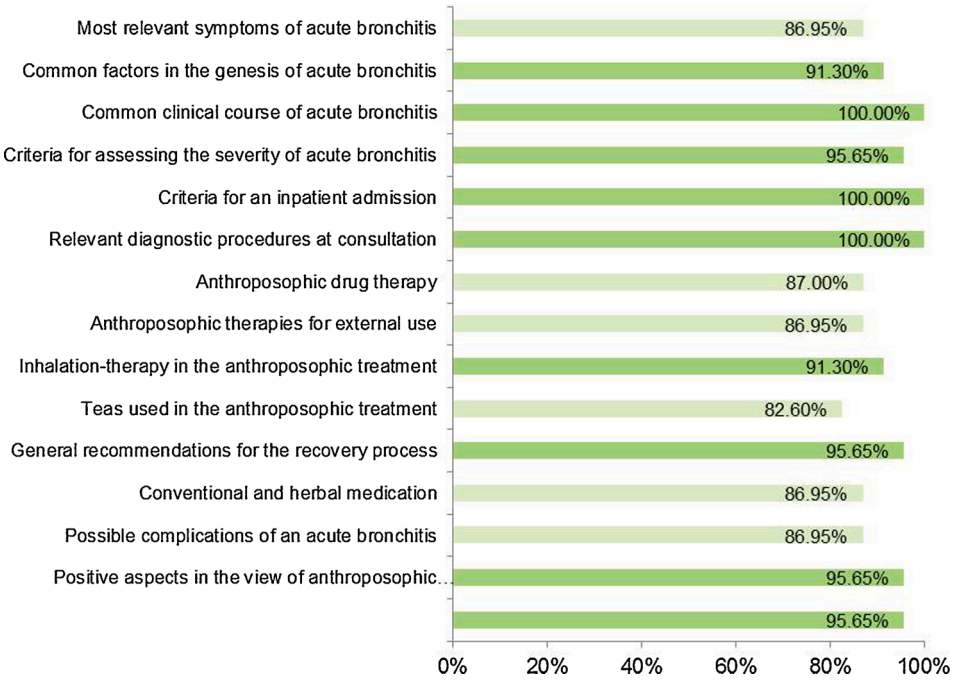

Fig. 2. Final consensus assessment score of the guideline.
Legend of the figure above: Strong consensus of participating experts on an item (>90 %) is displayed in dark green bars; consensus (>75 %–90 %) in light green bars.

Table 2
Anthroposophic drug therapy.

	Medication	Indication and effect	Dosage
Cough/ bronchial mucus	*Bryonia e radice D6 globules (WALA)*	Acute bronchitis, dry to productive and painful cough	Infants: 3–6 × 3 globules/day Toddlers: 3–6 × 5 globules/day Schoolchildren/teens: 3–6 × 8 globules/day
	Tartarus stibiatus D4 trituration (WELEDA)	Viscous cough; mucolytic	3–5 × 1 tip of knife/day
	Bronchi Plantago velati globules (WALA)	Mucolytic (also in case of laryngitis/tracheitis)	Infants: 4–5 × 3 globules/day Toddlers: 3–5 × 5 globules/day Schoolchildren/teens: 3–5 × 8–10 globules/day
	WELEDA Hustenelixier (WELEDA)	Irritable cough of acute bronchitis, viscous mucus, scratchy throat; cough relief and mucolytic	Toddlers and schoolchildren/teens: 3 × 1 teaspoon/day
	WELEDA Flechtenhonig (WELEDA)	Irritable cough and viscous mucus; cough relief and mucolytic	Toddlers and schoolchildren/teens: 3 × 1 teaspoon/day
	Plantago cough linctus (WALA)	Dry irritable cough; cough relief and mucolytic	Toddlers and schoolchildren/teens: 3 × 1 teaspoon/day
Bronchial obstruction	*Cuprum Aceticum D4 Dilution (WELEDA)*	Bronchial obstruction; spasmolytic and warming	Infants: 3 × 3 drops/day Toddlers: 3–5 × 5 drops/day Schoolchildren/teens: 3–5 × 10 drops/day
	Nicotiana comp. globules (WALA)	Bronchial obstruction; spasmolytic	Infants: 3 × 3 globules/day Toddlers: 3–5 × 5 globules/day Schoolchildren/teens: 3–5 × 10 globules/day
	Tabacum Cupro cultum Rh D 3 Dilution (WELEDA)	Bronchial obstruction; spasmolytic	Infants: 3–4 × 3 drops/day Toddlers: 3–6 × 5 drops/day Schoolchildren/teens: 3–5 × 10 drops/day
Fever	*Aconitum e tubere D 6 globules (WALA)*	Sudden fever, paleness, cold sweat	Infants: 3–5 × 3 globules/day Toddlers: 3–5 × 5 globules/day Schoolchildren/teens: 3–5 × 10 globules/day
	Apis Belladonna velati globules (WALA)	High fever, reddening, local infection	Infants: 3–5 × 3 globules/day Toddlers: 3–5 × 5 globules/day Schoolchildren/teens: 3–5 × 10 globules/day
Sore throat	*Pyrit/Zinnober tablets (WELEDA)*	Sore throat	Infants/toddlers/schoolchildren/teens: 3–4 × 1 tablets/day

Legend to Table 2: Infants (<1 year), toddlers (1–5 years) and schoolchildren/teens (6–18 years).

- Significant reduction of the general condition
- Emergence of complications (e.g. atelectasis, emphysema)

Relevant diagnostic procedures at physician's consultation (100 % consensus)

- Proper auscultation (ventral and dorsal). Clinical examination of the body, especially assessment of the respiratory tract
- Assessment of the clinical state (e.g. breathing frequency, retractions, use of accessory respiratory musculature)

Anthroposophical drug therapy (87 % consensus)

Experts recommended several mucolytic remedies: Tartarus stibiatus D4 trituration (WELEDA), Bronchi Plantago velati globules (WALA), WELEDA Hustenelixier (WELEDA), WELEDA Flechtenhonig (WELEDA) and Plantago cough linctus (WALA) (Table 2). Moreover, Bryonia e radice D6 globules (WALA) was recommended for dry to productive and painful coughing. As pediatric inpatients with acute bronchitis often suffer from bronchial obstruction, Cuprum Aceticum D4 Dilution (WELEDA), Nicotiana comp. globules (WALA) and Tabacum Cupro cultum Rh D 3 Dilution (WELEDA) were recommended to support spasmolysis. In addition, Aconitum e tubere D 6 globules (WALA) and Apis Belladonna velati globules (WALA) are the remedies of choice to treat infection-caused fever. Experts also suggest the use of Pyrit/Zinnober tablets (WELEDA) to treat the complaint of a sore throat that might occur during the infection.

A differentiated overview of the anthroposophic remedies, symptoms and indications in age appropriate doses is shown in Table 2. Summarized anthroposophic therapies are also provided in pocketcard format in additional file 3.

Several remedies are compositions. All active ingredients are listed as supplemental data (Additional file 4).**Anthroposophic therapies for external use (86 % consensus)**

Non-pharmaceutical anthroposophic therapies in the form of compresses and embrocations are an additional way of encouraging the healing process. Experts recommended compresses with powder of ginger, which may have a secretolytic effect and help to loosen a strong and irritable cough. A compress with lavender oil may ease a painful cough and help with sleeping. In case of obstruction, a compress with powder of mustard has a warming and mucolytic effect. Moreover, regular embrocations with *WALA Plantago Bronchial Balm (WALA*) may also bring cough relief.

A detailed description and instruction for preparation and application is presented in Table 3.**Inhalation therapy in the anthroposophic treatment (91 % consensus)**

Table 4
Inhalation therapy in the anthroposophic treatment.

Inhalant	Indication	Dosage
Sodium chloride 0.9–3 % (2 mL)	Viscous mucus, moistening and secretolytic	3×/day
Sodium chloride 0.9 % (1 mL) + *Cuprum aceticum comp.* ampoules *(WALA)* (1 ampoule à 1 mL)	Obstruction	3–6×/day
Sodium chloride 0.9 % (2 mL) + *Tabacum Cupro cultum Rh D3* Dilution (*WELEDA)* (5 drops)	Obstruction and dry as well as irritable cough	3–6×/day
Sodium chloride 0.9 % (1 mL) + *Pulmo/Vivianit comp.* ampoules *(WALA)* (1 ampoule à 1 mL)	Beginning pneumonia and during convalescence	1–3×/day

A further important aspect in the treatment of acute bronchitis is the inhalation therapy (Table 4). The conventional inhalation with sodium chloride can be supplemented with anthroposophic remedies. As such, *Cuprum aceticum comp.* ampoules *(WALA*) are suggested to be added in case of obstruction and *Tabacum Cupro cultum Rh D3* Dilution (*WELEDA)* shall be taken when the cough is dry and irritable. Inhalation with additional *Pulmo/Vivianit comp. (WALA)* has been recommended in cases where there is a risk that the acute bronchitis might turn into a pneumonia, and to help during the time of convalescence.**Teas used in the anthroposophic therapy (82 % consensus)**

- Lime blossom tea
- Addition of honey to the tea

General recommendations in support of the recovery process (95 % consensus)

- Relaxation and calms in home environment; avoidance of stimuli and impressions (social media, television, child should be taken out of school if necessary). Hereby self-healing may be encouraged
- Rich fluid supply to promote secretolysis
- Child should have warm feet and the thermal management of the entire organism shall be strengthened
- Acceptance of fever without suppressing it

Conventional and herbal medication (86 % consensus)

- Inhalation with salbutamol in case of obstructive symptoms
- Herbal cough syrups, such as *Prospan cough syrup*

Table 3
Anthroposophic therapies for external use.

	Chest compress/embrocation	Indication and effect	Preparation and application
Cough/ bronchial mucus	Compress with powder of ginger	Strong and irritable cough; secretolytic	Dissolve 1–2 tablespoons of ginger powder in 500 mL hot water. Immerse a thin cotton cloth (e.g. muslin nappy) into the solution and wring it out firmly. Unfold it onto a big towel or woolen cloth. Lay the child down onto both hand warm layers and firmly wrap it around entire chest. 1×/day for 20–30 min around noontime
	Compress with lavender oil 5 %	Unrest, sleep disturbances and painful distressing cough; cough relief	Drop 2–5 ml or about 10 drops of lavender oil 5 % onto a cotton cloth and warm it up between two hot-water bottles. Put the lukewarm compress on the child's chest and wrap a woolen cloth around. 1–2×/day for several hours or leave during the night
	Embrocation with *WALA Plantago Bronchial Balm (WALA)*	Cough; cough relief	Apply cherry-sized amount of balm onto the child's chest. 2–3×/day
Bronchial obstruction	Compress with powder of mustard	Obstruction and starting pneumonia; warming and mucolytic	Generate slurry with 2–3 tablespoons powder of mustard and hot water; apply a thin layer onto a cotton cloth. Protect child's nipples and armpits from irritation with vaseline and cotton wool. Put the compress onto the chest and wrap a woolen cloth around the child. It causes strong warm up and burning. Remove immediately when sensation of burning gets too intense. Use only for children of approximately > 6 years. Apply oil (e.g. lavender oil) on skin afterwards for relief and care. 1×/d for 1–3 min

Possible complications of an acute bronchitis (86 % consensus)

- Transition into pneumonia
- Long-lasting susceptibility to infection accompanied by recurrent infections (often due to lack of sufficient time to recover)

Positive aspects of an acute bronchitis in the view of anthroposophic anthropology (95 % consensus)

- Improvement of immune system to subsequent greater strength and stability
- Strengthening of heart and lung system by establishing a new balance between the airy and the fluid part of the body
- The organism gets reshaped and the body adapts to its own infantile individuality

Aspects of interaction and counseling between physician and child's parents during consultation (95 % consensus)

- Encourage participation of parents during the consultation: Give instructions for application of compresses, embrocations and teas
- Show parents how important they are for the healing progress. Address and encourage them to provide closeness and calms (by snuggling, reading books out loud, tenderly looking after child)
- Encourage and teach about a healthy lifestyle: Healthy food, rich liquid supply, ensurance of healthy and sufficient sleep, teach application of compresses and inhalations, recommend moist room air, encourage warmth of the thermal management of the organism and renounce of social media and television
- Transmit assurance and calms to parents, listen to their worries, take away their fear of the disease
- Encourage the parent's trust into the self-healing power of their child

The clinical recommendations in German are available as additional file 5.

4. Discussion

Despite the frequent use of CIM and particularly AM in children, guidelines or recommendations are rare and this is true for acute bronchitis.[7,31–33] Therefore, we have initiated a project aiming to develop recommendations/guidelines for the anthroposophic therapies for the most frequent pediatric diseases leading to hospital admission.[34,35] On the one hand, it is very important for the anthroposophic physicians using such therapies as well as for all other physicians, parent and health insurance to make CIM and especially AM more comprehensible, applicable and comparable. Unfortunately, randomized controlled trials (RCTs) investigating anthroposophic therapies for pediatric acute bronchitis are lacking [7]and so it was not possible to set up an evidence-based guideline. However, to make the first step we decided to develop a consensus-based clinical recommendation by using an online multistep expert survey (Delphi process). AM is a holistic approach and therefore social and psychological aspects are included in the individual treatment. Due to this fact, we wondered if it is possible to receive a consensus for the recommended therapy approaches. Indeed, the here presented therapies (remedies, external application, inhalation) received more than 80 % consent by the experts. The recommended remedies and medicinal substances are easy available and applicable. All of them are approved by the federal institute for drugs and medical devices (BfArm) in Germany. Nevertheless, case series or clinical trials investigating effectiveness and safety of recommended remedies are rare. Some of the recommended remedies, *WALA Bronchi Plantago globules, WALA Plantago cough syrup* and *WALA Plantago Bronchial Balm*, at least have been subject to observational studies.[17–20] Improvement or cure of symptoms was stated and effectiveness concluded. A number of remedies (*Tartarus stibiatus, Bronchi Plantago, Cuprum aceticum, Pulmo Vivianit comp., Flechtenhonig* and *compress with ginger)* are also recommended in the "*Vademecum Anthroposophische Medizin"*, offering a structured collection of the experience of one or few physicians.[36,37] The insufficient evidence base also prompted us to initiate a prospective cohort study investigating practicability, effectiveness, safety and parent's satisfaction of the anthroposophic therapies for children with acute bronchitis in our hospital (ongoing). Moreover, these recommendations should also serve as groundwork for other clinical studies to create an evidence-based guideline in future.

The here presented recommendation is mainly addressed to clinical physicians, who intend to combine both, conventional medicine and CIM. AM is an integrative approach and shall therefore be used in conjunction with conventional medicine in order to achieve the best possible treatment of the patient.[12] At this point, we want to emphasize that this recommendation should not replace but complement the conventional treatment.

However, our recommendation can also be used as guide for anthroposophic as well as for non-anthroposophic physicians working in the outpatient care treating children with mild courses of the disease.

Summarized, the presented manuscript closes a scientific gap and provides a novelty with these first consensus-based clinical recommendations in the widely unexplored field of anthroposophic therapies in pediatrics.

Of course, further trials (e.g. RCTs) are necessary to increase evidence level of AM therapies.

5. Limitations

The method of an online-based Delphi process was chosen, as it had already served successfully for the development of a guideline for the anthroposophic treatment of pediatric acute gastroenteritis.[26] Herewith, it was shown to be a suitable method for the generation of anthroposophic guidelines. However, the used Delphi process, as with every survey, has been subject to some possible bias. A bias that needs to be addressed is the rather moderate participation rate of 14.7 %–37.7 %. It has also been shown in other medical studies, that even though surveys are a crucial tool for the exploration of new subjects, unfortunately participation is often a difficulty.[38–40] We sent survey links via email, due to accessibility and cost effectiveness. Several reminders were sent out, which increased the response rate but also lengthened the process. However, experts agreed upon this clinical recommendation by the required consensus and there is no broad deviation so results were considered eligible. The subitem "Criteria for an inpatient admission" does not provide a definition for "low oxygen saturation" and a common understanding (<90 %) was assumed.

The wide range of therapies AM offers has not been fully represented. Art and movement therapies, even though they are important in the holistic treatment, have not been explored as they are not primarily executed by physicians. Nevertheless, the main elements of the anthroposophic therapy have been shown.

The selection of experts was performed conscientiously, aiming to include working physicians with expertise in pediatric AM in German in- and outpatient care. Yet, results could only be drawn from the pool of participants and do not necessarily represent the opinion of all internationally working anthroposophic pediatricians. Also the level of experience of participating doctors might have shown a range, as physicians with differed educational levels were included.

The software tool MAXQDA was used for qualitative analysis of answers, which was carried out by two independent reviewers. Still, bias in the process of condensing information by wording cannot be fully excluded. Even though these clinical recommendations are intended to be used internationally, the information has been drawn from German physicians only and might therefore not be applicable on a global scale. Anthroposophic remedies are mainly available in Germany, Switzerland and Austria so this recommendation will be useful especially whithin these countries.

6. Conclusion

There are no consensus-based clinical recommendations for the treatment of acute bronchitis in children from the field of AM and no RCTs are available. Therefore, these clinical recommendations are novel and contribute to making AM more accessible and applicable to a wider public of physicians and health insurances in Germany.

These recommendations provide the basis for further clinical studies evaluating the effectiveness and safety in the context of evidence-based medicine.

The Delphi process served efficiently as a tool for condensing the individual knowledge of many experts into consensus-built recommendations.

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 bronchitis in children: A Delphi survey". The authors insure 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.

Ethics approval and consent to participate

The performance of this Delphi process was approved by the ethics commission of the University Witten/Herdecke (179/2016). Content of survey participants were not necessary.

Our study includes no patient data.

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Declaration of Competing Interest

The authors report no declarations of interest.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.ctim.2021.102736.

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