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OTOLOGY

Postoperative management of pediatric tympanostomy tubes: a Yo-IFOS consensus

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Abstract

Purpose Ventilation tube (VT) insertion is the most common surgical procedure in children, but there is known significant variation in post-operative management regimens. This Clinical Consensus Statement (CCS) aimed to establish an evidence-based framework for the follow-up management of children with VT.

Methods Consensus was sought using a modified Delphi protocol among 23 international otolaryngologists (16 otologists and 7 pediatric otolaryngology specialists) of the IFOS (World ENT Federation). Forty statements were assessed by a 9-point Likert scale through a systematic literature review and three rounds of survey. The consensus level was rated as strong (mean ≥ 8.00, no outliers), consensus (mean ≥ 7.00, ≤ 1 outlier), near consensus (mean ≥ 6.50, ≤ 2 outliers), or no consensus.

Results Nineteen out of 23 panelists scored the two Delphi rounds. From the 34 original statements, 4 reached strong consensus, 19 reached consensus, 4 reached near consensus, and 7 failed to reach consensus. The highest level of agreement was achieved regarding chronic otorrhea management, patient education protocols, and surveillance of retraction pockets. Different follow-up approach for short, intermediate and long tubes was proposed by the panel.

Conclusions This CCS provides novel, evidence-based, comprehensive guidance for post-operative management of VT. The recommendations underscore individualized care with special emphasis on patient education and surveillance for complications.

Keywords Pediatric otolaryngology · Otitis media · Tympanostomy tubes · Postoperative management

Introduction

Ventilation tube (VT) insertion is the most commonly performed surgery in children, with an estimated 667,000 procedures per year in the United States alone [1–3]. Indications for insertion of tympanostomy tubes are most frequently persistent middle ear effusion or recurrent otitis media. Despite the routine nature of the procedure, post-operative care and follow-up policies vary widely [4, 5]. Current guidelines recommend intervals between 2 weeks and 6 months for initial postoperative visits [6–8], intervals between 3 and 4 months [9], and one yearly examination for follow-up [10]. In addition to the timing of follow-up, other aspects of postoperative care show variation in practice. For example, routine prophylactic water precautions have been abandoned from most recent guidelines but remain widely recommended by individual clinicians [1]. Audiometry monitoring schedules are also diverse, with conflicting recommendations on the timing of postoperative testing [1, 11].

Heterogeneous monitoring practices are known to influence patient outcomes [12]. In addition, the heterogeneity of

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tube types and patients mandates differentiated but reasonable approaches to follow-up care [13–16].

This clinical consensus statement (CCS) aims to resolve these difficulties by aggregating available evidence and formulating clear, actionable recommendations for the treatment of patients with tympanostomy tubes. The CCS seeks to provide a standardized approach to follow-up care that can be tailored to each patient while allowing for much-needed flexibility through a systematic review of the existing evidence reinforced by expert opinion. This is the first systematic attempt to generate evidence-based, standardized follow-up protocols for VT and to address an important knowledge gap in clinical practice, aiming to assist clinicians in delivering high-quality, equitable care while being attentive to the imperative of individualization according to patient-specific factors and healthcare system resources.

Methods

The CCS was The CCS was developed using the modified Delphi protocol outlined by Rosenfeld et al. [17]. Considering the study design, institutional review board approval was not required. This CCS aims specifically at providing a framework for VT pediatric patients' management, and was initiated by three of the authors (F.S., N.V.P., A.M.).

Panelists' Selection and Purpose of the Consensus Statement

The development group was composed of a chair (N.V.P), an assistant chair (A.M.), and a methodologist (A.M.S.). All panelists were recruited voluntarily with the pediatric and otology research group of the under-45 group of the International Federation of Otolaryngological Societies (Yo-IFOS). The Yo-IFOS research group is an invitation-only group, whose members are selected by the Yo-IFOS scientific committee, among worldwide board-certified otolaryngologists < 45 years of age. The selection is based on the extent and impact of their scientific achievements. The group is subdivided according to members' subspecialties, and for this CCS members from the otology and pediatric subgroup were selected, restricting the potential participants to those who had a relevant clinical and/or research interest in VT. No authors had relevant financial disclosures or reported any potential conflicts of interest.

Literature Review

A systematic literature review based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework was performed in multiple databases. Electronic databases including MEDLINE, EMBASE, Scopus, and Web of Science were comprehensively searched using specific combinations of keywords: ("tympanostomy tubes" OR "ventilation tubes" OR "grommets" OR "myringotomy tubes") combined with ("postoperative care" OR "follow-up care" OR "management protocols" OR "patient education" OR "water precautions" OR "complications" OR "otorrhea" OR "tube extrusion" OR "audiometry" OR "hearing outcomes") and ("children" OR "pediatric"). Searches were limited to English-language publications, and randomized controlled trials, clinical guidelines, systematic reviews, and consensus statements were prioritized. Titles and abstracts were screened independently by two reviewers for eligibility (A.M. and N.V.P), followed by a full-text review of potentially relevant articles. Disagreements were resolved through consensus discussion or by consultation with a third reviewer (A.M.S). Data extraction focused on management strategies, clinical outcomes, complication rates, audiometric follow-up, and patient education protocols. Quality assessment was conducted using appropriate validated tools tailored to each study design.

A total of 169 articles were initially identified from database searches. After the removal of duplicates and the exclusion of retrospective studies, 96 unique articles remained. Titles and abstracts of these articles were independently screened by two reviewers (A.M. and N.V.P.). Following this screening, 75 articles were excluded based on low evidence quality as recommended by Rosenfeld et al., leaving 21 potentially relevant articles for full-text assessment. After a thorough review, 7 articles met all inclusion criteria and were selected for detailed analysis. The titles of these articles can be found in Supplement 1. Disagreements between reviewers were resolved through consensus discussion or by consultation with a third reviewer (A.M.S.). These final 7 studies were circulated among all CCS authors for comprehensive evaluation. Data extraction specifically targeted management strategies, clinical outcomes, complication rates, audiometric follow-up, and patient education protocols. Quality assessment was performed using validated tools tailored appropriately to each study design.

Clinical Statement Development and Modifications in the Delphi Survey

The chair and assistant chair generated the core clinical statements for the survey based on the prior literature review and the goals of the CCS. After that, the statements were revised, expanded and elaborated on by the methodologist. A total of 34 statements were compiled based on the literature review and the study group's assessment of relevant clinical scenarios. We circulated the first draft of the survey

among the panelists, who were asked to propose statement modifications or to introduce other statements that they felt were useful for the CCS scope. No preliminary modifications or new statements were introduced in this phase. Consequently, a final 34-statement survey was developed and distributed to the authors via Google Forms (Google LLC, Mountain View, CA, USA).

We instructed all authors to complete the survey anonymously through the personalized and single-use link provided. Each author reported their level of agreement with a 9-point Likert scale (from strongly disagree −1 - to strongly agree −9) for each statement. The survey allowed raters to express their opinions anonymously after each Likert vote for each item. We defined the results for each statement as follows [17]:

- Strong consensus = mean score of ≥ 8.00 with no outliers (defined as any rating 2 or more Likert points from the mean in either direction);
- Consensus = mean score of ≥ 7.00 with no more than 1 outlier;
- Near consensus = mean score of ≥ 6.50 with no more than 2 outliers;
- No consensus = all other statements.

After the first round, non-consensus items were dropped from the CCS if the overall score was low or if inherent criticism from raters prevented rephrasing or further developing, or they were rephrased for the second round if the development group felt there was enough margin to gain further consensus. In selected cases, two items from the first round were merged in a single new statement if comments and vote evaluations indicated redundancy.

Results

The panel included 23 contributors, with 16 otologists (main focus of clinical work on otology) and 7 pediatric otolaryngologists (main focus of clinical work on pediatric otolaryngology). Various European, Mediterranean, Asian, African, and North and South American countries were covered. From the original 23 panelists, 19 took part in both Delphi rounds. From the 34 original statements, after 2 Delphi rounds, 4 items reached strong consensus, 19 reached consensus, 4 reached near consensus, and 7 failed to reach consensus (Fig. 1). Table 1 reports results for strong consensus and consensus items, Table 2 reports results for near-consensus items, and Table 3 reports results for non-consensus items. Online supplementary material 1

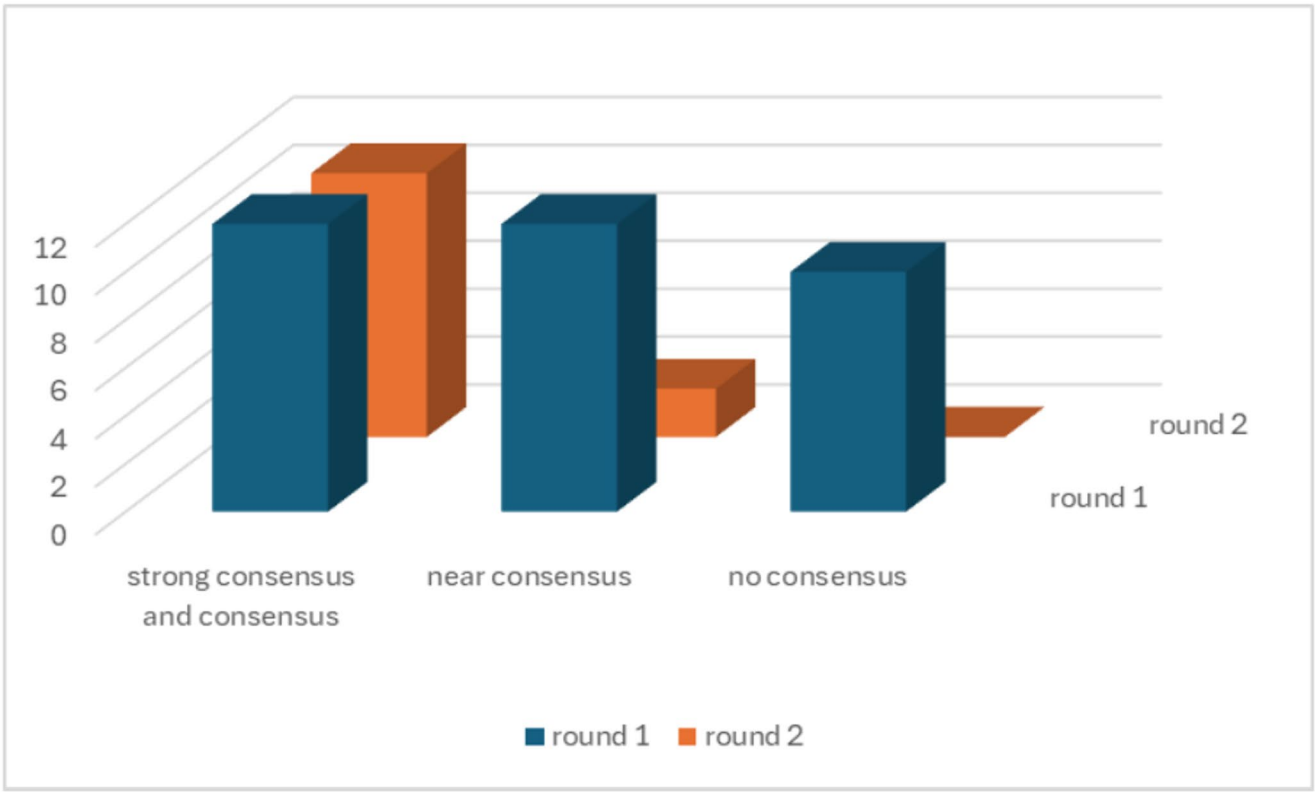

Fig. 1 Number of statements reaching strong consensus, consensus, near consensus and no consensus in the two Delphi rounds. From the first round to the second round, four statements were merged and five statements were dropped

Table 1 Strong consensus and consensus statements

Statement No.	Final version	Mean	Max	Min	Max	Outliers	Result	Delphi Round
20	Retraction pockets or atelectasis monitoring is advised to allow early detection of late cholesteatoma formation	8.00	9	4	9	0	strong consensus	II
31	Chronic otorrhea (persisting > 3 months) may indicate biofilm formation, tube dysfunction, or development of cholesteatoma, necessitating careful otoscopic examination and consideration of tube removal or replacement.	8.8	9	8	9	0	Strong consensus	I
32	Education should cover expected timelines for tube function and extrusion, adherence to the follow-up schedule even after apparent resolution of symptoms.	8.5	9	7	9	0	Strong consensus	I
34	Parents/caregivers should be informed about age-appropriate hearing milestones and instructed to report any concerns (of themselves, school teachers, speech therapists, …) about the child's hearing or language development	8.18	9	6	9	0	strong consensus	II
1	Close postoperative follow-up aims to prevent or promptly address any developing surgical complications through timely intervention, regardless of tube type.	7.40	8	3	9	1	consensus	I
2	Education of families and adequate counseling are required to emphasize symptom timelines obligating prompt reevaluation versus watchful waiting if concerning issues are present.	8.27	9	5	9	1	consensus	I
3	Changing retraction pockets or atelectasis demand reassessment to exclude unidentified ongoing issues, and the rare but serious complication of late cholesteatoma formation reinforces the need for long-term otologic follow-through.	7.93	8	5	9	1	consensus	I
4	Follow-up of children with short-term tympanostomy tubes is indicated every six months and parents should be educated about indications for earlier follow-up, for example infection/otorrhea	7.73	8	7	9	1	consensus	II
8	For intermediate tubes, Long-term assessments should focus on the condition and functionality, with 6–12 months intervals until OME recurrence is considered marginal	7.77	8	6	9	0	consensus	II
9	Intermediate tubes (Armstrong design) may be left in place for 2–3 years if functioning well and not causing complications. Removal timing should be based on the resolution of underlying middle ear disease, with consideration for extraction if the tubes become non-functional or if complications arise.	8.1	8	5	9	1	consensus	I
10	Due to their intended lifespan, long-term T-tubes necessitate a flexible follow-up schedule with progressively longer intervals for the whole indwelling period unless complications and tube patency or epithelial conditions may occur.	8.05	8	5	9	1	consensus	II
12	T-tube failure might warrant explant before the intended lifespan ends	7.27	8	5	9	1	consensus	II
13	Repeated objective audiometric assessment, especially surrounding the planned T-tube explant timing, ensures any conductive hearing impairment accumulated over the extended tube duration remains identified and addressed appropriately to mitigate long-term impacts.	7.5	8	3	9	1	consensus	I
14	Long-term T-tube removal timing should balance the risk of OME recurrence and the risk of complications such as tympanosclerosis or chronic otitis	7.68	8	4	9	0	consensus	II
16	Follow-up early visits (< 3 months) should monitor healing progress, while later ones should focus on complications and tube patency.	7.59	8	2	9	0	consensus	II
19	Persistent otorrhea at tube sites warrants relatively tighter follow-up intervals to support management of this common early complication.	7.3	7	4	9	2	consensus	I
21	Seriate audiometric testing at routine follow should be conducted and should be scheduled according to the clinical response	7.50	8	3	9	1	consensus	II
22	Scheduling targeted audiometry within 1–3 months postoperatively confirms restoration of hearing once effusion drainage occurs through the newly-placed tubes, verifying the immediate benefit of surgical intervention.	7.8	8	2	9	1	consensus	I
24	Water management for patients with ear tubes should be individualized based on tube type, clinical history, and healing progress, educating patients and caregivers on signs of water-induced complications	7.73	8	7	9	1	consensus	II

Table 1 (continued)

Statement No.	Final version	Mean	Max	Min	Max	Outliers	Result	Delphi Round
26	Topical antibiotic ear drops, with or without corticosteroids, are generally preferred as first-line treatment for uncomplicated otorrhea in patients with ear tubes and should typically be administered for 7–10 days, with reassessment if symptoms persist beyond this period.	8.4	9	4	9	1	consensus	I
27	Oral antibiotics should be considered in cases of otorrhea that fail to respond to topical treatment, or in the presence of systemic infectious symptoms.	7.91	8	6	9	0	consensus	II
29	For persistent or recurrent otorrhea, culture-directed therapy should be considered, with samples obtained through the tube or by tympanocentesis if the tube is obstructed.	8.3	9	5	9	1	consensus	I
33	Written materials, demonstration videos, and hands-on practice sessions during clinic visits could improve reinforcement of education points at each follow-up visit to address evolving concerns and ensure continued appropriate care as the child grows and their needs change.	8.2	9	2	9	1	consensus	I

Table 2 Near consensus statements

Statement No.	Final version	Mean	Median	Min	Max	Outliers	Result	Delphi Round
7	Short-term tubes that remain in place longer than 3 years should be considered for removal, carefully in balance with potential complications and ongoing benefits	7.59	8	5	9	2	near consensus	II
23	In case of documented conductive losses, tube reinsertion should be considered	6.95	8	3	9	1	near consensus	II
17	Further assessment approximately 6–12 months post-procedure particularly focuses on short-term tube condition and functionality, while intermediate or longer tubes necessitate monitoring every 3–6 months until planned explant.	7.73	8	4	9	2	near consensus, merged into 16	I
30	Systemic antibiotics may be necessary for cases involving fever, cellulitis of the pinna or adjacent skin, or in immunocompromised patients. The duration of oral antibiotic treatment is typically 10–14 days, with reassessment if symptoms persist.	8.27	9	5	9	2	near consensus, merged into 27	I
25	Regardless of the chosen water management strategy, patients and caregivers should be educated on signs of water-induced complications such as ear pain, drainage, or hearing changes. They should be instructed to seek prompt medical attention if these occur, and the water management approach should be reevaluated during routine follow-up visits to ensure it remains appropriate for the patient's current condition.	7.8	9	3	9	2	near consensus, merged into item 24	I

shows the statement score for each round and the respective evolution.

The panel reached the highest levels of agreement for statements concerning patient education, long-term tube follow-up schedule, and retraction pockets monitoring. The three highest scoring items were: “Parents/caregivers should be informed about age-appropriate hearing milestones and instructed to report any concerns (of themselves, school teachers, speech therapists, …) about the child’s hearing or language development”, “Due to their intended lifespan, long-term T-tubes necessitate a flexible follow-up schedule with progressively longer intervals for the whole indwelling period unless complications and tube patency or epithelial conditions may occur.” and “Retraction pockets or atelectasis monitoring is advised to allow early detection of late cholesteatoma development”.

Conversely, the lowest mean scores (4.8 and 5.33) and the highest number of outliers (six) were associated with two tube extrusion statements, respectively “Even after spontaneous tube extrusion, annual otologic checkups should carefully evaluate for possible later complications and ensure any residual conductive hearing impairment is identified and addressed appropriately over the long-term.” and “Due to the greater risk of premature extrusion compared to other tube types, short-term tube patients require relatively tighter postoperative follow-up intervals, with visits every 1–3 months during the critical initial healing phase.”

Table 3 No consensus

Statement No.	Final version	Mean	Median	Min	Max	Outliers	Result	Delphi Round
5	Follow-up visits scheduled between 1–3 months and again at 3–6 months are necessary to closely monitor the healing progress and tube patency during the expected 6–12 month extrusion period for short-term tubes.	6.8	8	1	9	3	no consensus	I
6	Due to the greater risk of premature extrusion compared to other tube types, short-term tube patients require relatively tighter postoperative follow-up intervals, with visits every 1–3 months during the critical initial healing phase.	4.8	5	1	8	6	no consensus	I
15	The first postoperative visit 1–2 weeks after surgery should rigorously examine for any early complications like bleeding, infection, or tube malposition requiring prompt intervention.	6.5	8	1	9	4	no consensus	I
18	Even after spontaneous tube extrusion, annual otologic checkups should continue scrutinizing for possible later complications and ensure any residual conductive hearing impairment is identified and addressed appropriately over the long-term.	5.3	5	1	9	6	no consensus	I
28	Acute otorrhea in patients with ear tubes should be promptly evaluated to determine the underlying cause, which may include acute otitis media, water exposure, or upper respiratory tract infections.	6.1	7	1	9	4	no consensus	I
11	Once the ear has fully healed following T-tube placement surgery and effusion resolution has stabilized long-term, follow-up intervals may be extended to every 6 months after the critical 2-year postoperative period has passed. However, diligent surveillance continues to inspect for delayed issues.	7	8	3	9	4	no consensus (merged into item 10)	I

Discussion

Preliminary Considerations

Insertion of tympanostomy tubes is one of the most frequently performed surgical procedures in children. In the last decades, clinical guidelines have become available to optimize clinical care pathways [1, 18]. Notably, there has been significant variability in postoperative management and follow-up strategies [4, 5, 19], and current guidelines concentrate, therefore, primarily on surgical indications rather than standardizing the post-operative care protocols [6, 7, 20]. This CCS aims to provide evidence- and expert-based recommendations focused on the post-operative management of patients with ventilation tubes, including visit timing, complication surveillance, and patient education [10, 21].

General Principles of Follow-Up

The panel developed a consensus on several key aspects of follow-up care for children with ventilation tubes. Close postoperative follow-up was agreed upon to promptly address any developing complications, regardless of tube type. Furthermore, early visits should monitor the healing process, while later ones should focus on complications and tube patency. Routine otoscopic examination proved to be the mainstay of follow-up management, with systematic assessment of tube position and patency and status of the tympanic membrane. Follow-up principles need to be adapted based on patient characteristics, including age, underlying diagnosis, and type of tube, which are also described in the literature [14, 22–24]. Literature portrays clear deficiencies in optimal follow-up in specific patient groups, namely craniofacial disorders, immunodeficiencies, and complex middle ear pathology [25–27].

Surveillance

Panelists reached a consensus on the timing of follow-up visits, although with more variation in agreement. While there was a strong consensus for initial postoperative evaluation within 2–4 weeks (mean score 8.4, one outlier), subsequent visit scheduling showed more variability in expert opinion.

One of the most important areas of debate was the timing and frequency of early postoperative follow-up. Although consensus was achieved regarding the need for an initial evaluation within the first month, statements addressing the optimal schedule for subsequent visits and early complication monitoring failed to reach consensus. This lack of agreement reflects the absence of strong evidence-based guidelines in the literature, as well as significant variability in clinical practice. Experts often rely on institutional protocols or personal experience, which differ widely across settings. In addition, local constraints—such as access

to specialized care, patient travel burden, and healthcare resource limitations—further shape follow-up strategies. This mirrors findings in prior studies that also highlight the heterogeneity of postoperative care pathways [19, 24].

Consensus was reached about the need for audiometric assessment within the first month to three months postoperatively to verify the restoration of hearing. Although most children show complete normalization of hearing after tube insertion, a small percentage had persistent hearing loss [11]. The frequency of follow-up audiometric testing was more variable and should be scheduled according to the clinical response. Especially in an international consensus paper, we should also take into consideration the limited availability or access to audiometric testing, which could affect the follow-up regionally.

Regarding complication surveillance, the panel strongly encouraged (mean score 8.8, no outliers) proactive monitoring for specific anatomical changes. This includes regular assessment for retraction pockets, which may indicate eustachian tube dysfunction persistence, and tympanic membrane atelectasis, which could presage more serious middle ear pathology. The consensus emphasized that early detection of these changes through systematic surveillance enables timely intervention and may prevent more serious complications [22].

The panel did not reach a consensus about the timing of the removal of retained short-term tubes. This is an ongoing area of debate in literature. Although most studies recommend removal after a period of >2–3 years, this is not supported by evidence or consensus [28–30]. The decision for the removal of short-term tubes should be based on the patient's characteristics, balancing potential complications and ongoing benefits. For intermediate tubes (Armstrong design), the panel did reach consensus that timing should be based on the resolution of underlying middle ear disease, with consideration of extraction if the tubes become nonfunctional or if complications arise. Similarly, for removal of retained long-term tubes (T-tube design), the panel reached a consensus to balance the risk of OME recurrence and the risk of complications such as tympanosclerosis and chronic otitis [31, 32].

Tube-Specific Management Protocols

The consensus panel developed extensive, differentiated follow-up guidelines by tube type as a reflection of differing tube characteristics, acknowledging that standardized protocols do not consider the diversity of ventilation tubes [23, 33].

For standard short-term tubes (e.g. Shepard or Armstrong types), the panel strongly recommended a six-monthly follow-up schedule. This guideline appropriately weighs the balance between sufficient surveillance and the practicalities of healthcare resource utilization.

For intermediate-duration tubes, the majority recommended assessment every 6–12 months, with progressive delays based on clinical stability. In addition, the panel supported a more flexible schedule for long-term T-tubes, with progressively longer intervals between clinic visits, but also taking into account their unique complications profile. Patient factors, access to healthcare, and geographic factors also have a major effect on compliance with follow-up protocols [22, 24, 34].

Complication Management

The use of topical antibiotic drops, with or without topical corticosteroids, was reached with high agreement for uncomplicated cases as the main intervention. This advice is based on strong evidence that topical therapy is effective and avoids systemic antibiotic exposure [35, 36]. Combination antibiotic-corticosteroid preparations were mostly found to be superior to single-agent therapy, notably in terms of reducing inflammation and time to discharge. For cases of persistent or recurrent otorrhea, the consensus strongly supported culture-directed therapy as an essential next step. This allows for targeted antimicrobial selection and identification of possible resistant organisms. The panel stated that oral antibiotics should be considered only in the setting of failed topical treatment or with systemic symptoms, reflecting increasing concerns about antimicrobial resistance and adverse effects from systemic treatment.

Chronic otorrhea was distinctly defined by consensus as the persistence of discharge for more than 3 months, which also was the definition with high agreement (mean score 8.7, no outliers). This time frame was selected based on evidence indicating that a discharge that persists beyond this time frame poses a significant risk of serious complications and indicates potential underlying pathology [4]. In particular, persistent otorrhea may represent biofilm development along the tube surface [37], tube malfunction with obstruction or displacement [8], or more concerning progression to retraction or cholesteatoma development [2, 4, 10].

Patient Education and Water Precautions

Patient education was another key domain for which there was strong consensus and high mean score (8.5, no outliers) favoring formal education protocols for follow-up care. The panel emphasized the importance of clear communication regarding expected tube duration and warning signs requiring prompt medical attention,

Regarding water precaution recommendations, the panel recommended an individualized approach based on tube

type, clinical history, and the healing process, educating patients and caregivers on signs of water-induced complications. This is supported by various papers in the literature [38–45].

Educational content had to be adapted to different levels of literacy and cultural environments to communicate effectively with diverse patient populations [46]. This emphasis mirrors an increasing understanding that patients and families who are educated are more likely to comply with treatment protocols and identify complications sooner. The panel agreed on the use of various modalities of educational content to reinforce key concepts, including written materials, demonstration videos, and hands-on practice during clinic visits. Family education deserves special focus on critical warning signs for which prompt medical attention is necessary.

Limitations and Future Directions

As with any consensus process, certain limitations must be acknowledged. While efforts were made to ensure diversity within the panel, the majority of contributors were based in Europe and North America, potentially limiting the global generalizability of the findings. Furthermore, country-specific scenarios or challenges might remain unaddressed in the CCS. Additionally, although the modified Delphi method offers structured and systematic consensus-building, it inherently reflects expert opinion influenced by local practice patterns and healthcare system variability, which may not align with all international settings, especially because not all continents were equally represented in the panel.

Moreover, despite our efforts to retain all panelists for every Delphi round, including follow-up with the panel members who did not take part in a survey round, we could not avoid the drop-out of four of the panelists. This should be taken into consideration because it might indicate that some potential concerns or viewpoints of some panel members were not taken into consideration in the final Delphi round. However, with 19 of the panelists included in all Delphi rounds, we believe the dropout rate remains negligible to the external validity of our results.

Finally, the nature of consensus statements implies that some recommendations are based on expert interpretation of limited or heterogeneous evidence rather than on high-level data. While every effort was made to anchor the statements in the best available literature, some clinical areas remain underexplored or lack definitive guidance. We recognize that real-world applicability may vary, and we encourage clinicians to adapt the proposed recommendations to their healthcare context, while also contributing to the future evidence base through ongoing research and clinical reporting. Nevertheless, in the discussion section we tried to explore systematically and explicitly for each statement which evidence was currently supporting it (with adequate references) or - on the contrary - lacking.

Conclusion

The importance of differentiating management protocols based on tube type and establishing regular otoscopic surveillance complemented by targeted audiometric assessment is mandatory. Standardized approaches to complications, particularly otorrhea, have been delineated. Clinical practice variations exist, especially regarding early postoperative visits and follow-up frequency, reflecting the complex interaction between patient factors, healthcare resources, and local clinical practices. Knowledge gaps include optimal follow-up intervals and long-term outcomes, which should be included in future research. The integration of emerging technologies and telehealth capabilities may be of interest in certain patient groups and geographic areas.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s00405-025-09485-8.

Declarations

Ethics Approval and Consent to Participate The authors have no potential conflicts of interest to report pertaining to this study. The authors received no funding for this article or related research. Ethical approval was not required because the study did not involve any patient-related data. All authors have contributed to the consensus paper and have given consent for publication for the final version of this work.

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