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The Utilization of Artificial Intelligence by Pediatric Otolaryngology Surgeons in Professional Practice

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Abstract

Importance. The role of artificial intelligence (AI) within medicine has increased exponentially over the last decade. However, adoption across medical specialties remains variable, influenced by institutional support, availability of tools, and concerns about accuracy, privacy, and legal liability. Addressing these barriers is necessary to achieving the full clinical capacity of AI.

Objectives. This study aimed to explore current AI usage patterns among pediatric otolaryngologists and highlight perceived benefits and barriers to adoption.

Design. Cross-sectional survey design.

Setting. All aspects of the present study were conducted remotely, with the survey link being distributed within a private group chat.

Participants. Participants were recruited via an international pediatric otolaryngology WhatsApp group chat. Admission is through invitation only.

Intervention or Exposures. The survey sought to characterize a variety of themes regarding AI, including utilization patterns, attitudes, motivational factors and barriers to adoption, and extent of institutional support.

Main Outcome Measures. Responses were evaluated using chi-squared tests and descriptive statistics.

Results. Survey responses were analyzed from 50 individuals, reflecting a response rate of 15.2%. More than half of survey respondents (60.9%, n = 28/46) use AI in practice, relying on tools like ChatGPT, iScribe, and Gemini to improve workplace efficiency (71.4%, n = 20/28) and address administrative burdens (64.2%, n = 18/28). Despite current adoption of AI, participants identified a lack of institutional guidelines (66.7%, n = 30/45) and support (54.3%, n = 25/47) as major barriers to widespread integration across the subspecialty. No statistically-significant association was found between age and likelihood of AI adoption ($P = .095$) nor was between geographic region and likelihood of AI adoption ($P = .505$).

Conclusions. Pediatric otolaryngologists are interested in and enthusiastic about AI tools. This study highlights prominent institutional and educational gaps, limiting widespread integration.

Relevance. The findings guide future efforts to support AI adoption in pediatric otolaryngology through tailored training, policy, and institutional support.

Keywords

pediatric otolaryngology, artificial intelligence, surgery, health care technology, institutional support, clinical efficiency

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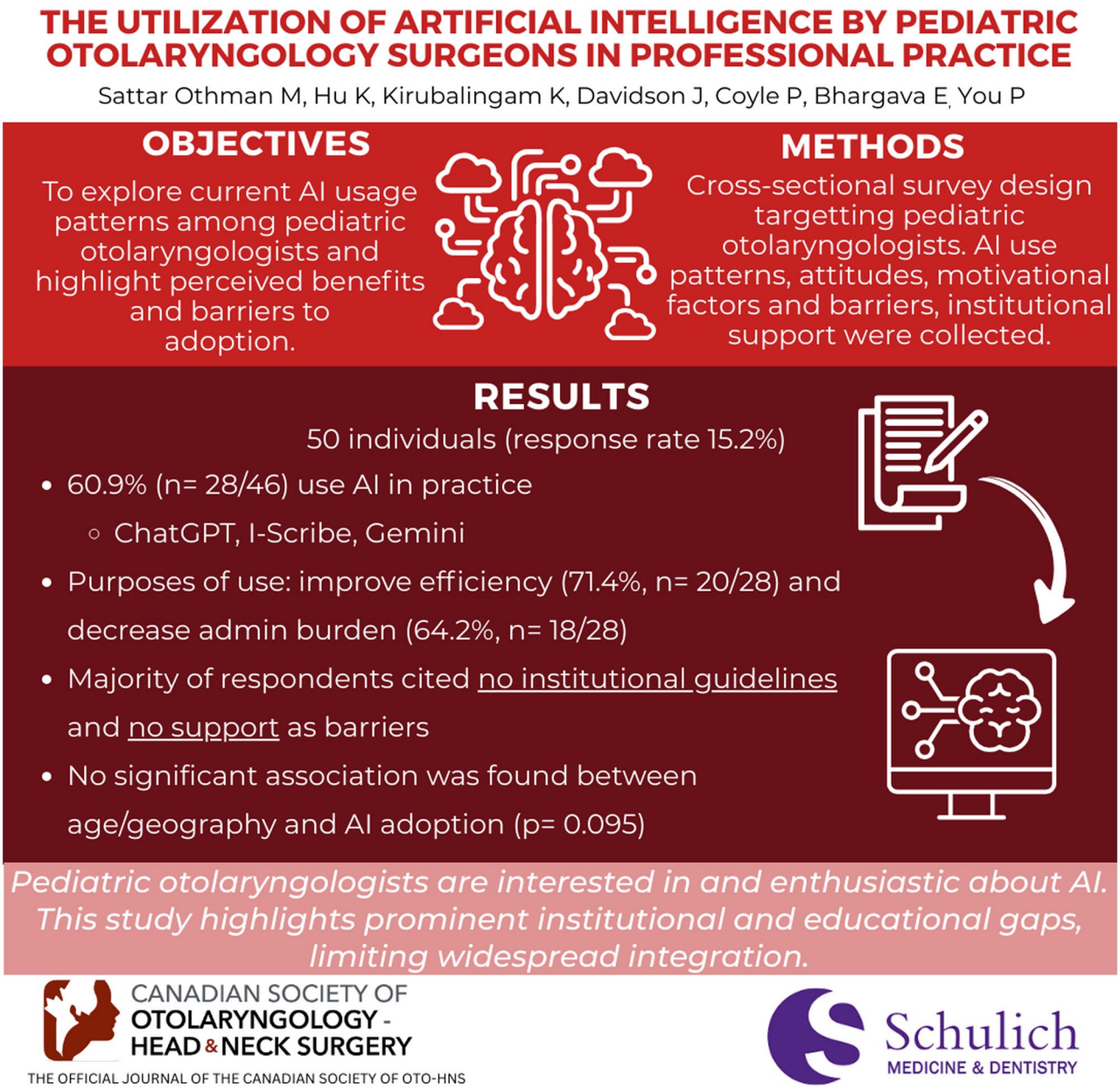
Graphical Abstract



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Key Message

- Most pediatric otolaryngologists have expressed enthusiasm toward utilizing and adopting AI into practice.
- Widespread integration of AI is limited by a lack of institutional support and policies, which must be addressed through clear guidelines and increased funding support.

Introduction

The presence of artificial intelligence (AI) in medicine has increased exponentially within the last decade,[1] with more than 1000 FDA-approved AI medical tools available on the market as of August 2025.[2,3] Despite this technological surge, the adoption of AI tools has been inconsistent and individualistic across different specialties and health care providers.[4] Specialties such as cardiology and orthopedics have started leveraging AI to diagnose arrhythmias and bone fractures,[5,6] while others have been limited by a lack of institutional support and specialty-specific tools.[7] In the absence of clear guidelines and policies, unresolved concerns pertaining to accuracy, patient privacy, and legal liability currently prevent clinicians from confidently adopting AI into their practice.[7,8]

Pediatric otolaryngology is an area of medicine that could benefit from AI integration. With the variety of complex conditions that rely on decision-making through data interpretation from various imaging modalities, audiograms, and endoscopies, AI tools have the potential to automate administrative tasks, streamline workflows, and enhance clinical efficiency. There are only 2 otolaryngology-specific AI tools available at this time,[2] posing an unique opportunity for institutions to implement guidelines and monitor AI usage before the rate of innovation accelerates.

A clinician's readiness to adopt novel innovations can be framed using the Five Stages of Technology Adoption framework,[9] whereby the optimal point to integrate technology into practice is during the "Early Majority" stage. To date, little is known about how pediatric otolaryngologists perceive and utilize AI tools in their clinical practice. This study aimed to assess the current landscape of AI adoption in pediatric otolaryngology by exploring usage patterns, perceived benefits and challenges, and factors influencing clinician attitudes toward AI. Understanding these perspectives will provide a foundation for informed policy development, education, and responsible innovation within the field.

Materials and Methods

Survey Design

An online, cross-sectional survey was developed to examine the utilization of AI tools by pediatric otolaryngologists. The survey consisted of 33 questions, designed to capture data on participant demographics (including age, biological sex, country of practice, and primary language used in clinical settings), current AI usage patterns, attitudes toward AI usage in clinical practice, and perceived barriers or challenges to AI adoption.

Survey questions were developed based on a review of relevant literature and emerging trends in AI adoption within health care. To ensure content validity and clinical relevance, draft questions were reviewed and refined in consultation with a small group of practicing pediatric otolaryngologists. The final survey contained a mix of question formats, including multiple-choice, Likert Scale items, and open-ended responses. The survey was administered using REDCap electronic data capture and hosted at London Health Sciences Centre Research Institute.[10,11] Institutional ethics review board approval was obtained from the Western University Health Sciences Research Ethics Board (REB #126268).

The final copy of the survey is included as Supplemental Material.

Participant Recruitment

Eligible participants were recruited through a private WhatsApp group consisting of, at the time, 329 pediatric otolaryngologists. Membership in this group is limited to practicing English-speaking pediatric otolaryngologists, whose identities are verified by administrators prior to admission. Recruiting within this group allows for a sample population that is ethnically diverse, with international representation from many countries.

The inclusion criteria of this study required that participants: (1) self-identified as pediatric otolaryngologists and (2) had the ability to read and complete the survey in English.

The survey link, along with a brief description of the study, was posted in the WhatsApp group chat in January 2025. The survey remained open for 6 weeks, with 2 reminder messages sent at 2 week intervals to encourage participation.

Statistical Analysis

Descriptive statistics were used to summarize demographic data and response patterns related to AI usage. Categorical variables were reported as frequencies and percentages. Likert Scale items grouped into binary categories ("agree" and "strongly agree" versus all other responses). Associations between demographic factors and AI adoption were assessed using chi-squared tests. A P-value $<.05$ was considered statistically significant. Statistical analyses were performed using IBM SPSS Statistics, version 29 (IBM Corp, Armonk, NY, USA).

Results

Participant Demographics

Of the 60 pediatric otolaryngologists from the WhatsApp group who answered the survey, 50 provided sufficient data to be included in the analysis (15.2% response rate, n = 50/329). Eighty-six percent of participants were between the ages of 35 and 55 (n = 43/50), with the remaining being between 56 to 65 (n = 6/50) and over 65 years of age (n = 1/50). Furthermore, 52.1% (n = 25/48) and 47.9% (n = 23/48) of respondents identified as male and female, respectively.

Table 1. Summary of Demographic Data.

Variable	Outcomes
Sex, n (%)	
Male	25/48 (52.1)
Female	23/48 (47.9)
Age group, n (%)	
Under 35	0/50 (0.0)
Between 35 and 45	21/50 (42.0)
Between 46 and 55	22/50 (44.0)
Between 56 and 65	6/50 (12.0)
Over 65	1/50 (2.0)
Primary region of practice, n (%)	
North America	16/50 (32.0)
South America	3/50 (6.0)
Europe	12/50 (24.0)
Asia	7/50 (14.0)
Africa	1/50 (2.0)
Australia	11/50 (22.0)
Primary practice setting, n (%)	
Academic hospital	39/50 (78.0)
Nonacademic hospital	4/50 (8.0)
Private practice	7/50 (14.0)
Length of practice, n (%)	
<5 years	11/50 (22.0)
5-10 years	9/50 (18.0)
11-20 years	18/50 (36.0)
21-30 years	11/50 (22.0)
>30 years	1/50 (2.0)

As illustrated in Table 1, 32.0% (n = 16/50) of survey participants primarily practiced in North America, followed by Europe, Australia, Asia, South America, and Africa. A broad range of languages was represented in the study, including Arabic, French, Finnish, Malayalam, Mandarin, and Spanish. English was the most-commonly-used language in primary practice, spoken by 61.7% (n = 37/50) of survey respondents.

Regarding primary practice settings, 78.0% (n = 39/50) of surgeons worked within academic centers, while the rest operated out of nonacademic hospitals or private institutions. Of those who reported length of practice, 60.0% (n = 30/50) had more than 10 years of experience within pediatric otolaryngology.

AI Utilization Patterns

The study revealed that 60.9% (n = 28/46) of participants currently use AI tools in clinical or academic settings (Table 2).

Table 2. Summary of AI Utilization in Practice.

Variable	Outcomes
Technology adoption category, n (%)	
Early adopters	20/46 (43.7)
Early Majority	17/46 (37.0)
Innovators	5/46 (10.9)
Late majority	4/46 (8.7)
Laggards	0/46 (0.0)
Current usage of AI in practice, n (%)	
Yes	28/46 (60.9)
No	18/46 (39.1)
Application domain, n (%)	
Nonclinical, administrative	15/28 (53.6)
Summarizing medical literature	11/28 (39.3)
Patient-facing chatbot	1/28 (3.6)
Translational services	7/28 (25.0)
Patient recommendations	4/28 (14.3)
Operative planning	0/28 (0.0)
Patient screening/diagnosis	1/28 (3.6)
Interpretation of investigations	1/28 (3.6)
Documentation	11/28 (39.3)
Billing	1/28 (3.6)
General communication	13/28 (46.4)
Other	5/28 (17.9)

Abbreviation: AI, artificial intelligence.

When asked to label themselves according to the Five Stages of Technology Adoption, 80.4% (n = 37/46) of respondents identified as "Early Adopters" or part of the "Early Majority" (Table 2). No statistically-significant association was found between age and likelihood of AI adoption ($\chi^2 = 6.3802$, $P = .095$). Similarly, no statistically-significant relationship was found between geographic region and likelihood of AI adoption ($\chi^2 = 1.37$, P .505).

Pediatric otolaryngologists used a variety of AI tools, including ChatGPT, iScribe, Gemini, and Claude (Figure 1). AI was primarily used by physicians for nonclinical, administrative purposes (53.6%), general communication (46.4%), and documentation purposes (39.3%; Table 2).

Attitude and Barriers to AI Adoption

Overall, 82.1% (n = 23/28) of participants expressed curiosity and enthusiasm for novel technology, believing AI could improve workplace efficiency (71.4%, n = 20/28) and reduce administrative burdens (64.2%, n = 18/28; Table 3).

However, participants also identified several barriers to AI adoption in pediatric otolaryngology (Table 3). Notably, 8.7% (n = 4/46) of survey respondents were not convinced of the added value of AI within clinical practice. Other deterrents to

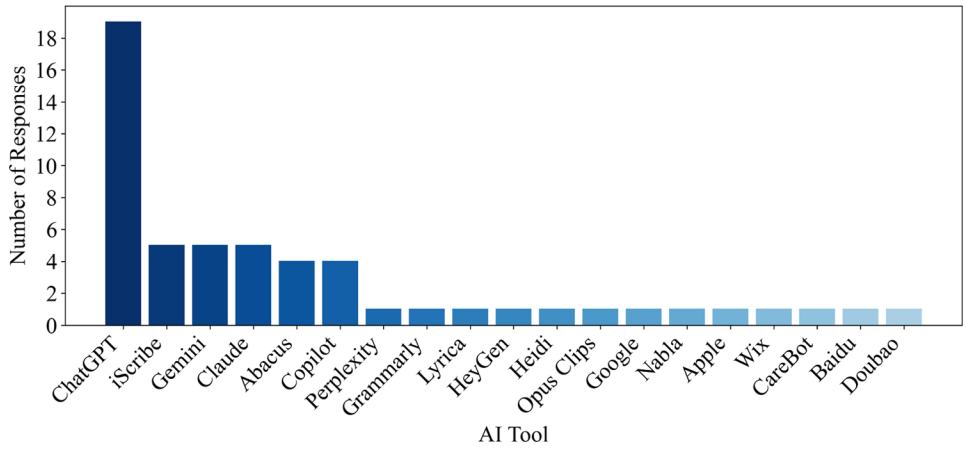

Figure 1. Depiction of the AI tools used by pediatric otolaryngology surgeons in clinical practice (n = 28).
Participants are using a wide array of AI tools in clinical practice, including ChatGPT (n = 19), iScribe (n = 5), Gemini (n = 5), and Claude (n = 5). AI, artificial intelligence.

AI adoption included concerns surrounding patient privacy (68.9%, n = 31/45), lack of guidelines (66.7%, n = 30/45), and fear of legal liability (56.8%, n = 25/44).

Despite existing challenges, 46.5% (n = 20/43) of participants expressed excitement about the increased use of AI in pediatric otolaryngology. Recognizing its limitations, 78.6% (n = 33/42) of surgeons did not perceive AI to be a threat to job security. Rather, participants viewed AI as a complementary tool, likely to expand in utility (97.7%, n = 42/43) and improve their performance as a physician (62.8%, n = 27/43).

Institutional Support and Policy

There is a general lack of institutional support for AI integration into clinical practice, as reported by 54.8% (n = 25/46) of participants (Table 3). Paid tools are either self-funded (n = 9/27) or split between colleagues (n = 3/27), with minimal financial assistance from employers (Table 4). Of 45 respondents, only 12 had access to institutional training for AI implementation while 30 reported a shortage of official guidelines. Three of 45 individuals (6.7%) were actively discouraged against using AI in practice by their institutions.

Table 3. Motivational Factors and Perceived Barriers to AI Adoption.

Variable	Outcomes
Motivational factor, n (%)	
Curiosity and enthusiasm for new technology	23/28 (82.1)
Scientific literature	7/28 (25.0)
Improve workplace efficiency	20/28 (71.4)
Address administrative burdens or time-consuming tasks	18/28 (64.2)
Recommended by mentors or colleagues	7/28 (25.0)
Differentiating my practice from others	0/28 (0.0)
Service requested by patients	0/28 (0.0)
AI was already incorporated into my practice	0/28 (0.0)
Potential complications, n (%)	
Not personally convinced of added value	4/46 (8.7)
Limited time to adopt AI	18/46 (39.1)
Difficult to incorporate into workflow	17/46 (37.0)
Limited understanding of how AI works	18/46 (39.1)
Lack of institutional support	25/46 (54.3)
Lack of guidelines	30/45 (66.7)
Uncertainty with remuneration of services	16/45 (35.6)
The cost of AI tools	14/45 (31.1)
Patient safety concerns	27/45 (60.0)
Patient privacy/data security concerns	31/45 (68.9)
Fear of legal liability	25/44 (56.8)

Abbreviation: AI, artificial intelligence.

Discussion

The study revealed that 97.7% of participants believed that AI adoption is increasing, primarily driven by the desire to improve workplace efficiency and reduce administrative burdens. Our findings are consistent with existing studies, demonstrating that AI can streamline clinical documentation, alleviate repetitive tasks, and enhance productivity.[12-14] Although 53.6% of pediatric otolaryngologists are using AI in nonclinical contexts, this is likely a reflection of the small number of specialty-specific tools available on the market.[2,3] As the rate of innovation accelerates, AI tools are expected to be used in more clinical capacities to develop patient care plans, screen and/or diagnose patients, and interpret investigation results. This is supported by the fact that 80.4% of participants identified as being "Early Adopters" or part of the "Early Majority" in technology adoption, suggesting that the subspecialty is well-positioned for further integration of AI.

Table 4. Summary of institutional and practice experiences.

Variable	Outcomes
AI training provided by institution/practice, n (%)	
No	31/45 (68.9)
Yes	12/45 (26.7)
Unsure	2/45 (2.2)
Institutional/practice attitudes toward AI, n (%)	
My institution has no formal policies on AI	32/45 (71.1)
My institution encourages the use of AI	10/45 (22.2)
My institution discourages the use of AI	3/45 (6.7)
Method of AI tool funding, n (%)	
Free to use	16/27 (59.3)
Self-pay	9/27 (33.3)
Funded by a group of physicians	3/27 (11.1)
Funded by hospital	4/27 (14.8)
Research grant	0/27 (0.0)
Other	0/27 (0.0)

Abbreviation: AI, artificial intelligence.

Despite overall enthusiasm toward the use of AI in pediatric otolaryngology, widespread adoption is hindered by several barriers.[15] While 60.9% of respondents reported the current use of AI, 54.3% did not have access to institutional support, which could be in the form of training and formal policies. Clinicians are often left to navigate these challenges independently, exacerbating AI hesitancy and professional risk. Lack of institutional support is not specific to pediatric otolaryngology, with similar encounters reported by radiology and oncology.[7,15-18] To mitigate these concerns, survey participants repeatedly emphasized the need for effective, standardized training. Institutions should bridge this gap by providing health care workers with foundational knowledge that encourages safe and ethical use of AI tools. It may also be advantageous to incorporate technology education into medical school curricula to produce AI-literate graduates.[19]

Interestingly, 6.7% of respondents were actively discouraged by their institutions from using AI while 8.7% were personally not convinced of its added value in medicine. These attitudes may be the result of general limitations surrounding the lack of reliability and accuracy of AI-generated outputs, with 1 participant identifying "AI hallucinations" as a deterrent to using it in practice. While similar findings are represented in other studies,[15,20,21] it is important to acknowledge that AI tools are routinely being refined to provide better results.[22]

Financial constraints were also notable; only 14.8% of respondents received financial backing from their institutions. This is consistent with the literature, which highlights funding as a barrier to AI adoption, particularly in resource-limited or community-based practices.[15,21,23] Despite initial costs, AI implementation can be rewarding in the long term by increasing clinical efficiency, reducing documentation time, and optimizing workflow productivity, all of which can alleviate costs and improve revenue capture.[13,14] Ultimately, addressing these barriers through institutional support, collaborative funding models, and policy interventions can facilitate broader and more equitable access to AI.

We did not find any statistically-significant relationship between AI adoption and demographic factors, such as age or geographic region. However, given the modest sample size, the potential influence of regional health care systems, funding models, and regulatory environments should not be overlooked. Evidence suggests that substantial regional variability in AI adoption patterns are driven by local policies, infrastructure availability, and cultural attitudes toward technology.[21,24] One scoping review found greater organizational readiness in North America and Europe, which allowed for earlier AI adoption.[21] Future studies with larger sample sizes and diverse geographic representation are required to examine these regional influences in greater detail.

This study has several limitations. Firstly, the 15.2% response rate for the study may not be reflective of the practices of all pediatric otolaryngologists. Secondly, participants were recruited through a subspecialty WhatsApp group consisting of international pediatric otolaryngologists. While this enabled us to capture the responses of a geographically-diverse cohort, it also restricted survey participation to only those who met the group's admission criteria. Consequently, the sample predominantly consisted of young, tech-savvy, and English-speaking surgeons, which does not capture the experiences of everyone within the subspecialty. Furthermore, 78.0% of respondents worked in academic centers, which may inflate reported enthusiasm and underrepresent the experiences of those in private, community, or resource-limited settings. It is also important to consider that the survey was conducted during the period of rapid AI advancement. As AI is met with increased adoption, our findings likely represent a snapshot of a dynamic and shifting landscape. Ongoing, repeated surveys will be needed to track changes over time. Nevertheless, this is the first study to map the current landscape of AI utilization in pediatric otolaryngology. Gathered insights can help inform targeted strategies to better support physicians in adopting emerging technology.

Conclusion

As AI rapidly transforms clinical practice, understanding how pediatric otolaryngologists are adopting AI can provide critical insights into how this subspecialty is engaging with emerging technologies. Our survey found that 60.9% of pediatric otolaryngologists are currently using AI in their practice, primarily to improve clinical efficiency (71.4%) and reduce administrative burdens (64.2%). However, widespread integration is hindered by institutional and financial barriers. Clear guidelines, standardized training, and financial support are necessary for the continuous and effective adoption of AI tools in pediatric otolaryngology.

Looking to the future, AI is posed to play a growing role in clinical care. Ensuring pediatric otolaryngologists are

adequately equipped to leverage these advancements will require ongoing surveys to track evolving attitudes toward AI. Future studies should explore longitudinal trends in AI adoption and evaluate the impact of targeted educational or institutional interventions to support responsible use of AI tools. Such efforts will help identify strategies that promote equitable and meaningful integration of AI into practice.

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Data Availability Statement

The data underlying the results are part of this manuscript.

Declaration of Conflicting Interests

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Ethical Considerations

Institutional ethics review board approval was obtained from the Western University Health Sciences Research Ethics Board (REB #126268).

Consent to Participate

Informed consent was implied through voluntary completion of the anonymous survey.

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Supplemental Material

Additional supporting information is available in the online version of the article.

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