


# Management of Peritonsillar Abscesses in Adults: Survey of Otolaryngologists in Canada and the United States

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## Abstract

**Objective.** The management of peritonsillar abscess (PTA) has evolved over time. We sought to define contemporary practice patterns for the diagnosis and treatment of PTA.

**Study Design.** Cross-sectional survey.

**Setting.** The 15-question survey was distributed to members of the Canadian Society of Otolaryngology–Head and Neck Surgery (CSO) and the American Academy of Otolaryngology–Head and Neck Surgery (AAO-HNS).

**Methods.** An iterative, consensus-based process was used for survey development. Primary outcomes were to determine methods of diagnosis and first-line treatments for PTA. Exploratory, secondary outcomes were analyzed using multivariable logistic regression models.

**Results.** The survey response rate was 12.6% ( $n = 1176$ ). Most participants were attending staff (86%) in a community hospital setting (60%) and had been in practice for more than 20 years (38%). Most respondents (78%) indicated that at least half of the time, cross-sectional imaging had already been performed before they were consulted. Half of respondents (49%) indicated that they perform incision and drainage of the abscess as first-line treatment, while few (16%) provide medical management alone. In exploratory analysis, participants from the AAO-HNS had higher odds of imaging already being performed before consultation (odds ratio [OR], 11.7; 95% CI, 4.6–29.4) and increased odds of using medical management alone as a first-line treatment (OR, 2.4; 95% CI, 1.3–4.2) compared to respondents from the CSO.

**Conclusion.** There is wide practice variation in the diagnosis and management of acute, uncomplicated PTA among otolaryngologists in Canada and the United States. The use of cross-sectional imaging and medical management alone may differ between countries of practice.

## Keywords

peritonsillar abscess, survey, otolaryngology–head and neck surgery, practice patterns, diagnosis, treatment

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Peritonsillar abscess (PTA) is the most common deep neck space infection and is among the most common on-call emergency consultations for otolaryngologists. Despite the tendency to be relatively benign, PTAs have potential for spread to other deep neck spaces, such as the parapharyngeal space, and can cause sepsis and airway obstruction.<sup>1</sup>

The management of PTA has evolved over many years. Traditional approaches considered surgical intervention to be essential, including combinations of needle aspiration, incision and drainage, and immediate tonsillectomy. Recent evidence indicates that medical treatment alone may result in less pain and faster return to normal oral intake and daily living without an increase in treatment failure or PTA-associated sequelae.<sup>2,3</sup>

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There is no universally accepted best practice for the diagnosis or management of PTA, and past surveys of otolaryngologists have revealed markedly varying diagnosis and treatment practices in the United States, Europe, and Africa.<sup>4-7</sup> However, these assessments are either antiquated, thereby reflecting noncontemporary practices, or not representative of the Canadian and US population as a whole. Given the frequency by which PTAs are managed by otolaryngologists, establishment of standard practice is essential for the development of future clinical practice guidelines. Therefore, we sought to define the current practice spectrum for the diagnosis and management of PTA in a more contemporary, up-to-date landscape.

## Methods

### Study Design

This study is a cross-sectional survey investigating practice patterns for PTA and is reported in accordance with the SURvey Reporting GuidelinE (SURGE).<sup>8</sup> This study was approved by the Nova Scotia Health Authority Research Ethics Board (1025437) and approved for distribution by the Canadian Society of Otolaryngology–Head and Neck Surgery (CSO) and the American Academy of Otolaryngology–Head and Neck Surgery (AAO-HNS). As outlined in the cover letter to potential participants, completion of the survey was anonymous, and completion was considered to be implied consent (see Supplemental Figure S1 in the online version of the article).

In this study, participants were asked to consider the diagnosis and management of acute, uncomplicated PTA. The survey provided participants with the definition of “acute, uncomplicated peritonsillar abscess” as those patients who have maintained at least minimal oral intake, have no signs of airway compromise, and have no involvement of other deep neck spaces on clinical exam.

### Outcomes

**Primary outcomes.** The primary outcomes of the study were to determine (1) methods of diagnosis and (2) first-line treatments for PTA among otolaryngologists in Canada and the United States.

**Secondary outcomes.** Exploratory secondary outcomes of the study included evaluating the types of medications used for medical management of PTA; the frequency of inpatient admission for management of acute, uncomplicated PTA in adult patients; the frequency of the use of culture and sensitivity in the treatment of PTA; and the role of practice setting, stage of practice, and country of practice on the diagnosis and management of peritonsillar abscess.

**Survey development.** Question generation and survey design were iterative between research team members. The principal investigator (D.F.) designed the draft survey, which was reviewed by the supervising investigator (M.H.R.) for content revision. This process was repeated until consensus approval by both investigators was reached, at which point

the survey was distributed to 2 coinvestigators (P.H., M.C.). Further suggestions by the coinvestigators were incorporated until consensus agreement was reached (D.F., P.H., M.C., M.H.R.), at which point the survey was reviewed by an expert in survey research (A.G.). Further suggestions were incorporated, and the prototype version was approved by consensus.

**Survey pretesting and validation.** The survey prototype was pretested by a total of 6 otolaryngology–head and neck surgery attending staff and resident physicians at Dalhousie University (Halifax, Nova Scotia, Canada). These participants were not excluded from answering the final disseminated survey if they chose to participate in the study. The survey was disseminated in an identical format to the final survey, including use of the online platform. Cognitive interviewing techniques and “think-aloud” completion of the survey were performed in person during the completion of the pretest.

Cognitive interviewing during pretesting allowed assessment of whether respondents understood the questions being asked, whether they answered in a consistent way, and whether they answered questions within the intended response format.<sup>9</sup> Pretest participants were asked what they thought each question was asking and were asked to think out loud as they answered the survey.

The prototype was then revised to incorporate feedback obtained during the pretesting phase. Minor wording changes of 3 questions were ultimately incorporated. The coinvestigators (D.F., P.H., M.C., M.H.R., A.G.) involved in the prototype development reached consensus agreement on the final survey (see Supplemental Figure S1 in the online version of the article) before dissemination. The final survey consisted of 9 questions related to PTA management and 6 demographic questions and took less than 5 minutes to complete.

The electronic data capture system REDCap was used as the survey platform. The online survey programming was debugged by repeated completion of the inactive survey link by 10 resident physicians until no additional typographic, item logic, or other issues could be identified. All items within the survey, except age, were set as required items before the survey could be submitted.

**Survey distribution and platform.** The final survey was electronically distributed to attending otolaryngologists, fellows, and resident physicians through the CSO and AAO-HNS. Prestudy membership estimates were 500 and 12,000, respectively. These sampling frames have reliable and accurate coverage of otolaryngologists in Canada and the United States, respectively, minimizing selection bias.

The survey was distributed to the CSO membership via mass email with a cover letter and link to the survey in June 2020, and the survey remained open until July 2020. A reminder email with a link to the survey was sent 2 weeks after the initial survey participation request. The survey was distributed to the AAO-HNS membership via mass email with a cover letter and link to the survey in December 2020 and remained open until January 2021. Due to organizational

policies, no reminder email was sent to the AAO-HNS membership. The cover letter, attached to the distribution emails, described the study premise, expected length of completion time, and voluntary participation. The cover letters were signed by the principal and supervising investigators (D.F., M.H.R.) on behalf of the coinvestigators. There were no financial incentives provided for survey participation. No prenotification was used for either membership dissemination group.

**Statistical analysis.** To achieve a survey margin of error of 5% with 95% CIs for our primary outcomes, a total of 373 completed surveys were needed (required 3% response rate based on prestudy membership estimates).

Nominal and ordinal data are reported with descriptive statistics, including absolute and relative frequencies. Continuous data are reported with the median and interquartile range (IQR). Tests of normality included the Shapiro-Wilk test and visualization of histograms and quantile-quantile plots.

Primary outcomes are presented as descriptive analysis of unadjusted frequencies and percentages. Exploratory secondary outcomes were compared using  $\chi^2$  or Fisher exact tests, as appropriate. Separate exploratory post hoc multivariable logistic regression models were developed to determine whether the use of cross-sectional imaging and medical management alone differed by several a priori selected variables, including national society membership, stage of practice, practice setting, the number of PTAs treated per year, and the length of time in practice. For the use of cross-sectional imaging, the response categories of question 3 (see Supplemental Figure S1 in the online version of the article) were combined into “less than half” (“never/almost never/seldomly”) and “more than half” (“about half the time/often/almost always/always”). In a post hoc sensitivity analysis, an ordinal logistic regression model was used without combination of survey response categories. For the use of medical management, the response categories of question 5 (see Supplemental Figure S1 in the online version of the article) were combined into “medical management alone” and “surgical management” (“incision and drainage/needle aspiration/hot tonsillectomy/other”). Model fit (Hosmer-Lemeshow goodness-of-fit test,  $P \geq .5$ ), the absence of multicollinearity (all included covariates had variance inflation factor [VIF]  $<4.0$ ),<sup>10</sup> influential observations (assessed through casewise diagnostics),<sup>11</sup> and model overspecification were verified on naive models. The effect of clustering by province and state of practice were explored with generalized estimating equation models, but model convergence issues necessitated the use of naive models.<sup>12,13</sup>

Statistical analysis was performed using SAS University Edition (SAS Institute). As missingness was minimal, complete case analysis was used for each individual item of interest.

## Results

### Survey Uptake

In total, 9279 potentially eligible participants received an invitation to complete the survey. This included 779 CSO members (response rate,  $n = 208$ , 26.7%) and 8500

**Table 1.** Respondent Demographics (N = 1176).

Variable	No. (%)
Stage of practice	
Attending staff	1002 (85.5)
Fellow	26 (2.2)
Resident physician	136 (11.6)
Retired	8 (0.7)
Missing	4
Practice population	
Adult patients only	130 (11.1)
Mixed adult and pediatric patients	1005 (85.8)
Pediatric patients only	37 (3.2)
Missing	4
Practice setting	
Tertiary/academic	276 (23.6)
Community	706 (60.2)
Both tertiary/academic and community	175 (14.9)
Military	9 (0.8)
Other	6 (0.5)
Missing	4
Length of time in practice	
1 to 5 years	200 (17.1)
6 to 10 years	133 (11.4)
11 to 15 years	132 (11.3)
16 to 20 years	138 (11.8)
>20 years	445 (38.0)
I am retired	5 (0.4)
I am a resident physician or fellow	119 (10.2)
Missing	4
Number of PTAs treated per year	
$\leq 10$	375 (31.9)
11 to 20	477 (40.6)
21 to 30	166 (14.1)
31 to 40	78 (6.6)
>40	73 (6.2)
Does not currently treat PTA	7 (0.6)

Abbreviation: PTA, peritonsillar abscess.

AAO-HNS members (response rate,  $n = 968$ , 11.4%). The total response rate was therefore 12.6% ( $n = 1176$ ). The interim response at the time of the reminder email to CSO members was 68% of the total CSO response rate ( $n = 143$ ).

### Participant Demographics

Respondent demographics are found in **Table 1**. The median age of respondents was 48 years (IQR, 37–58 years). Most participants were attending staff (86%), with fewer identifying as resident physicians (12%). Most participants reported treating both pediatric and adult patients (86%), practiced in a community hospital setting (60%), and had been in practice for more than 20 years (38%). Ontario (6.3%) and California (5.7%) were the most frequent jurisdictions of practice, followed by Texas (5.6%) and New York (4.7%; see Supplemental Table S1 in the online version of the article). Membership demographics could not be provided by either distributing

**Table 2.** Primary Study Outcomes.

Variable	No. (%)
Patient had imaging before consultation	
Never	26 (2.2)
Almost never	96 (8.2)
Seldomly	141 (12.0)
About half the time	235 (20.0)
Often	245 (20.9)
Almost always	388 (33.1)
Always	42 (3.6)
Missing	3
Diagnostic modality	
History and physical examination alone	1053 (89.8)
Order CT scan	92 (7.8)
Other	28 (2.4)
Missing	3
First-line management	
Tonsillectomy <sup>a</sup>	8 (0.7)
Incision and drainage	579 (49.4)
Medical management alone	184 (15.7)
Needle aspiration	384 (32.7)
Other	18 (1.5)
Missing	3

Abbreviation: CT, computed tomography.

<sup>a</sup>“Hot” tonsillectomy (immediate tonsillectomy at time of acute abscess presentation).

organization to allow for nonrespondent demographic comparison. Most participants treated fewer than 20 abscesses each year (72%; **Table 1**), and less than 1% did not treat any PTAs in the past year.

### Primary Outcomes

Most (78%) respondents indicated that at least half of the time, cross-sectional imaging had already been performed before they were consulted, with a third indicating that imaging was almost always done beforehand (**Table 2**). Despite this, 90% of respondents indicated they routinely make the diagnosis of PTA based on history and physical examination alone if no imaging was obtained, with only 8% indicating they would order imaging if not already performed at time of consultation (**Table 2**). Free-form responses indicated that respondents thought cross-sectional imaging and needle aspiration were important diagnostic tools for unclear cases after history and physical examination (see Supplemental Table S2 in the online version of the article).

Half of respondents reported that they perform incision and drainage of the abscess as first-line treatment (49%), while few provide medical management alone (16%). Almost no respondents perform tonsillectomy at the time of acute abscess presentation (0.7%).

### Secondary Outcomes

In addition to analgesia and antipyretics, other first-line non-surgical management routinely prescribed included intravenous

**Table 3.** Secondary Study Outcomes.

Variable	No. (%)
Adjunct medical management used	
Intravenous antibiotics	570 (48.5)
Intravenous steroids	512 (43.5)
Intravenous fluids	398 (33.8)
Oral antibiotics	787 (66.9)
Oral steroids	426 (36.2)
Admit patient	88 (7.5)
Microbial culture	
Never	363 (31.0)
Yes, always	496 (42.3)
Yes, sometimes	314 (26.8)
Missing	3
Management changes with culture results	
Strongly agree	20 (1.7)
Agree	109 (9.3)
Neither agree nor disagree	237 (20.2)
Disagree	474 (40.4)
Strongly disagree	333 (28.4)
Missing	3

(IV) antibiotics (48%), IV steroids (44%), and oral antibiotics (67%; **Table 3**). Other common adjunct treatments included intramuscular steroids and antibiotics when patients were treated in an office setting (see Supplemental Table S3 in the online version of the article). Few respondents (8%) regularly admitted patients with acute, uncomplicated PTA (**Table 3**). When respondents performed surgical management (needle aspiration, incision and drainage, or tonsillectomy) for management of PTA, 31% never sent specimens for microbial culture and sensitivities. When cultures and sensitivities were obtained, 69% disagreed or strongly disagreed that they routinely change management plans as a consequence of the results (**Table 3**).

In exploratory analysis, there was a significant difference between membership organizations in how often patients had imaging performed before consultation to otolaryngology–head and neck surgery, with 2% of CSO members and 40% of AAO-HNS members ( $P < .0001$ ; **Table 4**) indicating imaging was almost always performed. Similarly, 10% of AAO-HNS members indicated they would order cross-sectional imaging, if not already performed, before making the diagnosis of PTA, compared to 0.5% of CSO members ( $P < .0001$ , **Table 4**). Participants responding from the AAO-HNS had higher odds of imaging already being performed before consultation (odds ratio [OR], 11.7, 95% CI, 4.6–29.4; **Table 5**) after adjusting for the number of PTAs treated per year and for practice level. In a post hoc sensitivity analysis, similar findings were confirmed with an ordinal logistic regression model demonstrating higher odds of preconsultation imaging frequency for AAO-HNS member participants.

There was a significant difference in use of medical management alone for first-line management between CSO members (7%) and AAO-HNS members (18%,  $P < .0001$ ;

**Table 4.** Exploratory Analysis of Secondary Outcomes Across Organization of Practice and Stage of Practice.

Independent variable	Dependent variable, No. (%)		P value		
	AAO-HNS	CSO			
Admit patient			.06		
No	900 (93.2)	185 (89.4)			
Yes	66 (6.8)	22 (10.6)			
Patient had imaging before consultation			<.0001		
Always	41 (4.2)	1 (0.5)			
Almost always	384 (39.8)	4 (1.9)			
Often	239 (24.7)	6 (2.9)			
About half the time	195 (20.2)	40 (19.3)			
Seldomly	69 (7.1)	72 (34.8)			
Almost never	28 (2.9)	68 (32.9)			
Never	10 (1.0)	16 (7.7)			
Diagnostic modality			<.0001		
History and physical examination alone	854 (88.4)	199 (96.1)			
Order CT scan	91 (9.4)	1 (0.5)			
Other	21 (2.2)	7 (3.4)			
First-line management			<.01		
Tonsillectomy <sup>a</sup>	7 (0.7)	1 (0.5)			
Incision and drainage	447 (46.3)	132 (63.8)			
Medical management alone	169 (17.5)	15 (7.3)			
Needle aspiration	330 (34.2)	54 (26.1)			
Other	13 (1.4)	5 (2.4)			
	Stage of practice				
	Attending staff	Fellow	Resident physician	Retired	
Admit patient					.1
No	923 (92.2)	26 (100)	128 (94.1)	6 (75)	
Yes	78 (7.8)	0 (0)	8 (5.9)	2 (25)	
Patient had imaging before consultation					<.01
Always	39 (3.9)	0 (0)	3 (2.2)	0 (0)	
Almost always	326 (32.6)	11 (42.3)	48 (35.3)	1 (12.5)	
Often	217 (21.7)	5 (19.2)	22 (16.2)	1 (12.5)	
About half the time	205 (20.5)	5 (19.2)	24 (17.7)	1 (12.5)	
Seldomly	115 (11.5)	2 (7.7)	24 (17.7)	0 (0)	
Almost never	79 (7.9)	2 (7.7)	14 (10.3)	1 (12.5)	
Never	20 (2.0)	1 (3.9)	1 (0.7)	4 (50)	
Diagnostic modality					.31
History and physical examination alone	904 (90.3)	21 (80.8)	118 (86.8)	8 (100)	
Order CT scan	72 (7.2)	4 (15.4)	16 (11.8)	0 (0)	
Other	25 (2.5)	1 (3.9)	2 (1.5)	0 (0)	
First-line management					<.01
Tonsillectomy <sup>a</sup>	7 (0.7)	0 (0)	0 (0)	1 (12.5)	
Incision and drainage	467 (46.7)	14 (53.9)	93 (68.4)	5 (62.5)	
Medical management alone	175 (17.5)	3 (11.5)	4 (2.9)	0 (0)	
Needle aspiration	336 (33.6)	8 (30.8)	38 (27.9)	2 (25.0)	
Other	16 (1.6)	1 (3.9)	1 (0.7)	0 (0)	

Abbreviations: AAO-HNS, American Academy of Otolaryngology–Head and Neck Surgery; CSO: Canadian Society of Otolaryngology–Head and Neck Surgery; CT, computed tomography.

<sup>a</sup>“Hot” tonsillectomy (immediate tonsillectomy at time of acute abscess presentation).

**Table 5.** Exploratory, Post Hoc Multivariable Analysis of Secondary Outcomes.<sup>a</sup>

Variable	OR (95% CI)	
	Patient had imaging before consultation	Medical management alone <sup>b</sup>
Organization (reference = CSO)		
AAO-HNS	11.7 (4.63-29.37)	2.38 (1.35-4.21)
Stage of practice (reference = resident physician)		
Attending staff	1.07 (0.64-1.8)	6.79 (2.45-18.79)
Fellow	0.86 (0.3-2.53)	3.92 (0.81-18.94)
Retired <sup>c</sup>	1.78 (0.19-16.56)	-
Number of PTAs treated per year (reference = 1 to 10)		
11 to 20	0.99 (0.69-1.4)	1.48 (1.0-2.19)
21 to 30	1.3 (0.86-1.97)	1.71 (1.03-2.86)
31 to 40	0.67 (0.29-1.55)	2.0 (0.0-4.01)
>40	0.85 (0.40-1.78)	1.21 (0.57-2.55)

Abbreviations: AAO-HNS, American Academy of Otolaryngology–Head and Neck Surgery; CSO, Canadian Society of Otolaryngology–Head and Neck Surgery; OR, odds ratio; PTA, peritonsillar abscess.

<sup>a</sup>For both models, practice setting and length of time in practice were found to be collinear and were therefore removed from the models.

<sup>b</sup>For the “medical management alone” model, participants who answered “other” were removed.

<sup>c</sup>Participants who answered retired were removed from the “medical management alone” model due to low number of observations and model convergence issues.

**Table 4).** There was also a significant difference between attending staff (18%), resident physicians (12%), and fellows (3%,  $P < .0001$ ; **Table 4**), as well as between community (20%), military (44%), and mixed community-tertiary (13%) practices in the use of medical management alone ( $P < .0001$ ). In adjusted analysis (**Table 5**), participants responding from the AAO-HNS had increased odds of using medical management alone as a first-line treatment compared to surgical management (OR, 2.4; 95% CI, 1.3-4.2). Attending staff had higher odds of using medical management compared to resident physicians (OR, 6.8; 95% CI, 2.5-18.8).

## Discussion

In this survey of otolaryngologists in Canada and the United States, preconsultation imaging was common, and most respondents performed surgical interventions as first-line treatment for uncomplicated PTA. Diagnostic and therapeutic practices varied by country of practice, number of PTAs treated per year, and stage of practice.

In a recent survey of trainees and consultants in Ontario, Canada, Wu et al<sup>14</sup> showed substantial variability in the management of uncomplicated PTA. The choice of antibiotic and duration of treatment varied, with 10-day courses of amoxicillin–clavulanic acid being the most common. Similar to our study, the use of imaging for the diagnosis of PTA by otolaryngologists was infrequent in their study (11%). However, as outlined in our study, the overall use of imaging remains high, with most patients receiving imaging before consultation to otolaryngology–head and neck surgery actually occurs. Notably, Wu et al<sup>14</sup> highlighted the need for a large, international study to further characterize practice patterns for the purposes of informing contemporary practice guidelines. We have accomplished this goal with the current

study of over 1000 otolaryngologists across Canada and the United States.

The possibility of medical management alone for treating uncomplicated PTA has recently been investigated. Battaglia et al<sup>2</sup> reviewed patients treated in the Kaiser Permanente health system and found no significant differences in treatment success or complications by those treated with medical or surgical interventions. In a recent meta-analysis of observational studies, there was similarly no difference in treatment failure rates between those treated with surgery or medical management alone.<sup>3</sup> This was again confirmed in a recent large retrospective cohort study.<sup>15</sup> Despite evidence to suggest the utility of medical management alone, we found relatively little uptake of this practice as first-line management in the currently presented study.

To further understand differences in practice patterns, the country in which respondents practiced was explored. This was found to have a significant association with the use of preconsultation imaging and medical management. Variation in the use of medical imaging between countries has been seen in other conditions.<sup>16-19</sup> Differences between countries in diagnostic and treatment modalities may be a result of jurisdiction-specific guidelines, litigation rates, physician training background, reliability of patient follow-up, and a myriad of other factors. The cost-effectiveness of this practice has not been directly investigated.<sup>20,21</sup> Interestingly, participants from the AAO-HNS were more likely to use medical management alone, which may be a reflection of the higher use of imaging before consultation, whereby peritonsillar cellulitis, as opposed to a fully developed abscess, may be confirmed. Similarly, surgical interventions such as needle aspiration may be thought of as diagnostic procedures when prior imaging has not been obtained, which may also explain

its increased use among CSO members. Regardless, the use of medical management alone may be especially beneficial when patients are treated at hospitals without support of an otolaryngologist or for minimizing the performance of aerosol-generating medical procedures.<sup>22,23</sup> Differences in practice patterns must be interpreted with caution, as these findings were generated in a post hoc, exploratory secondary analysis.

The findings of this study must be taken in the context of its design. Nonresponder, recall, and volunteer bias may be present. The response rate of this study was, overall, low. However, response rates within the both societies were twice that typically received (personal communication, 2020). Differences in experience, training, and behavior between physician responders and nonresponders also have been found to be less than anticipated, suggesting the role of nonresponder bias may be minimal in health care survey research.<sup>24-26</sup> The ability to send a reminder email differed between the 2 organizations, and as such, there may be differential responder bias. Furthermore, membership in one organization does not preclude membership in the other, and as such, a subset of members may have received 2 invitations to join the study. However, no participants indicated this issue within the available free-text questions, and therefore the overlap is likely low. The brevity of the disseminated survey may have benefited the response rate,<sup>27-29</sup> but the diagnosis and management of PTA can be nuanced, and tonsillopharyngitis may present on a spectrum from cellulitis to PTA. This is evidenced by previous work suggesting the specificity (50%) and sensitivity (78%) of clinical impression alone are both low.<sup>30</sup> As indicated in some responses, management of each patient is unique, and it is difficult to fully capture the breadth of practices with a limited number of survey questions. Specific clinical scenarios will dictate management for individual patients, including abscess size, time of presentation, management setting, and resource availability. Additional work is required to identify potential factors clinicians leverage for decision making. The practices of primary care physicians, such as emergency medicine, interface with the practices of consultants. We are currently exploring this important aspect of the diagnosis and management of PTA in a separate study. Last, the psychometric properties of the survey have not been formally assessed.

This study has contributed to the framework by which future clinical practice guidelines may be developed. Standardization in the management of acute, uncomplicated PTA may be beneficial for training medical students and resident physicians, as well as in treating patients where physicians experienced in PTA are not readily available. Future studies should also further investigate why practice patterns vary between countries and how these patterns may differ outside Canada and the United States.

## Conclusion

This cross-sectional survey of otolaryngologists in Canada and the United States indicates a wide practice variation in the diagnosis and management of acute, uncomplicated PTA. The use of cross-sectional imaging and medical management may

differ between countries, with an overall infrequent use of medical management alone demonstrated. This study provides a framework for the standardization of care in future clinical practice guidelines and highlights key areas of future research.

## Author Contributions

**David Forner**, study design, conduct, analysis, manuscript preparation, manuscript revision, final approval; **Christopher W. Noel**, study design, manuscript preparation, manuscript revision, final approval; **Amy Grant**, study design, conduct, manuscript revision, final approval; **Paul Hong**, study design, conduct, manuscript revision, final approval; **Martin Corsten**, study design, conduct, manuscript revision, final approval; **Vincent Wu**, study design, manuscript preparation, manuscript revision, final approval; **S. Mark Taylor**, study design, final approval; **Jonathan R. B. Trites**, study design, final approval; **Matthew H. Rigby**, study design, conduct, manuscript preparation, manuscript revision, final approval.


## Disclosures


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## Supplemental Material

Additional supporting information is available at <http://journals.sagepub.com/doi/suppl/10.1177/2473974X211044081>

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