

Improving Access to Otolaryngology–Head and Neck Surgery Expert Advice Through eConsultations

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Objectives/Hypothesis: Prolonged wait times have become common. Electronic consultations (eConsults) have been shown in previous studies to reduce unnecessary face-to-face consultations to specialists, but no prior study has investigated the feasibility or efficacy of eConsults in an otolaryngology–head and neck surgery (OTO-HNS) practice.

Study Design: Prospective observational study.

Methods: The Champlain BASE eConsult system is a secure web portal allowing primary care physicians (PCPs) to communicate asynchronously with specialists about a patient, without requiring a formal face-to-face consult. The data from all eConsults sent through this portal to OTO-HNS practices between July 2011 and January 2015 were collected and analyzed.

Results: Response time was rapid; over 40% of eConsults received a response within 24 hours, and nearly all eConsults were answered within 7 calendar days. The median response time was nearly 29 times faster than traditional face-to-face consultation. Unnecessary face-to-face referrals were avoided in 33.4% of all eConsults, and in nearly 50% of cases where the PCP initially planned a formal referral. PCPs reported adopting a new or additional course of action over 50% of the time following an eConsult. Eighty-eight percent of PCPs reported the service to be valuable for their patients, and 92% found it valuable for themselves. eConsults require only a limited time commitment from specialists, with over 75% taking less than 10 minutes to complete.

Conclusions: eConsultation is a cost-effective system that can lead to decreased wait times, improved communication between PCPs and otolaryngologists, and help guide the development of targeted continuing professional development modules for PCPs.

Key Words: eConsult, telemedicine, telehealth, electronic consultation, eConsultation, wait times.

Level of Evidence: 4.

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INTRODUCTION

Prolonged wait times prior to specialist assessment have become the norm in the Canadian socialized healthcare system. This troublesome phenomenon has worsened progressively over the years, with the average wait time to see a specialist now 130% longer than it was in 1993.¹ Not only is the specialty of otolaryngology–head and neck surgery (OTO-HNS) not immune

from this problem, but OTO-HNS wait times are increasing at an alarming rate. The average wait time between primary care physician (PCP) referral and assessment by an otolaryngologist was 7.8 weeks in 2015, a 251% increase from 1993. Furthermore, the average surgical OTO-HNS patient waited an additional 10.7 weeks prior to their procedure, meaning the typical patient presenting to their PCP with a surgical otolaryngological complaint went nearly 5 months without treatment.¹

Virtual consultations have been implemented to try to improve access. Telemedicine programs, which refer to using videoconferencing technology to allow the patient to be examined and communicated with remotely, have been demonstrated to reduce wait times.² Electronic consultation (eConsult) is a novel electronic tool—different from telemedicine—that allows PCPs to receive advice about a clinical question directly from a specialist without requiring the patient to be present. The process happens asynchronously using a secure online platform, and allows PCPs to share relevant information including patient records, reports, and multimedia (including photographs and videos). eConsults are becoming more widely available and have been shown to play a valuable role in improving access to specialists, as well as in the prevention of unwarranted referrals. There have been several reports on the impact of eConsults across multiple different medical specialties.^{3–8}

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Q1. Which of the following best describes the outcome of this eConsult for your patient:

1. I was able to confirm a course of action that I originally had in mind
2. I got good advice for a new or additional course of action
3. I did not find the response very useful
4. None of the above (please comment)

Q2. As a result of this eConsult, would you say that:

1. Referral was originally contemplated but now avoided at this stage
2. Referral was originally contemplated and is still needed - this eConsult likely leads to a more effective visit
3. Referral was not originally contemplated and is still not needed - this eConsult provided useful feedback/information
4. Referral was not originally contemplated, but eConsult process resulted in a referral being initiated
5. There was no particular benefit to using eConsult in this case
6. Other (please comment)

Q3. Please rate the overall value of the eConsult service in this case for your patient:

Minimal 1 — 2 — 3 — 4 — 5 Excellent

Q4. Please rate the overall value of the eConsult service in this case for you as a primary care provider:

Minimal 1 — 2 — 3 — 4 — 5 Excellent

Q5. We would value any additional feedback you provide:

[Optional free text field]

Fig. 1. Mandatory survey completed by primary care physicians following completion of the eConsult.

No prior study has investigated the use of eConsults in an OTO-HNS practice. In our study, we aimed to determine the utilization, efficacy, and impact of eConsults in OTO-HNS, as well as to determine the types of questions most commonly asked by PCPs.

MATERIALS AND METHODS

Champlain BASE eConsult System

Established in 2010, the Champlain BASE eConsult system is a secure web application where PCPs can initiate an eConsult about patients in a secure and confidential manner using a secure online portal hosted by the Winchester District Memorial Hospital on behalf of the Champlain Local Health Integration Network. The referring provider is asked to provide the patient's demographic information (age and gender being mandatory), as well as a question for the specialist. Supplementary files can be attached to the eConsult including imaging or laboratory results, or multimedia (such as pictures or videos). Communication is performed asynchronously, with an expectation that a response will be received within 7 days. As of May 2016, over 15,000 nonurgent consults spanning 86 different specialties have been submitted using this system,⁷ making it one of the largest multispecialty eConsult services worldwide.⁹ The development and implementation of this system has been detailed at length in multiple previous publications.^{6,10,11}

Each eConsult submitted to OTO-HNS was answered by one of two Royal College of Physician and Surgeons of Canada-certified (FRCSC) otolaryngologists (P.M., D.T.). After receiving a response, PCPs were given the option to either close the encounter or reply to the otolaryngologist for further clarification. Specialists were paid on a prorated hourly basis to respond to the eConsults.

Data Collection and Analysis

Utilization statistics including time for PCP to receive answer and specialist time to complete the eConsult were collected prospectively. A mandatory five-question survey (Fig. 1) was completed by all PCPs after their eConsult encounter was closed. By classifying them into one of six categories (Fig. 1, question 2), question 2 allowed us to determine the impact of the eConsult on the final outcome. eConsults that were classified into group 1 represent "prevented consults," whereas those classified into groups 2 or 4 were considered "necessary consults." Finally, a "change in plan" was deemed to have occurred if an eConsult was classified into either group 1 or 4. Questions 3 and 4 employed a five-point Likert scale to assess PCP satisfaction (Fig. 1, question 3/question 4). Physicians were considered to place a high degree of value in the service if they assigned it a rating of 4 or 5.

The close-out survey for the specialist asked only one question, requiring that each otolaryngologist report the length

TABLE I.

Question Types Identified in eConsults to Otolaryngology–Head and Neck Surgery.

Question Type	Count
Diagnosis (n = 43)	
What test to choose	12
“Should this be biopsied?”	10
Interpretation of an imaging report	9
Other diagnostic question	9
Interpretation of a clinical finding	2
Disease etiology/risk factors	1
Management (n = 65)	
“Should I refer?”	32
General management question	30
Indications/goals of treating a particular condition	2
Indications for a procedure	1

cConsults = electronic consultations.

of time required to respond to the eConsult with the options provided being <10 minutes, 10 to 15 minutes, 15 to 20 minutes, or >20 minutes). This self-reported time was used for determining specialist compensation.

Following the defined study period, the eConsults were independently reviewed by two authors (S.K., P.M.) using a predefined list of question types (based on a validated taxonomy¹² (Table I) and clinical topics (Table II). All discrepancies were discussed until consensus was reached.

eConsults with multiple questions of different types were classified as “more than one question (unclassifiable).” Consensus was achieved for all inter-rater discrepancies following a discussion between the two raters.

Study Setting and REB Approval

Data collection for this study took place between July 2011 and January 2015. The study took place in a large health region in eastern Ontario, Canada. Research ethics approval for this project was obtained from the Ottawa Health Science Network–Ottawa Hospital Research Institute Research Ethics Board (file no. 2009848-01H).

RESULTS

Of the 5,597 eConsults completed through the Champlain BASE eConsult system between April 2011 and January 2015, 109 eConsults (1.9%) were directed toward OTO-HNS. Most eConsults were received from physicians (95/109; 87%), although 14/109 (13%) were from nurse practitioners. The youngest patient referred was 6 months old, with the oldest being nearly 83 years old (average age 43.3 years). The vast majority (76.1%) of these eConsults were completed by the otolaryngologist in less than 10 minutes, with 97.2% being completed within 15 minutes. No eConsult took the specialist longer than 20 minutes to complete.

The average length of time between eConsult creation by the PCP and submission of the first response by the otolaryngologist was 3 days, whereas the median response time was 1.89 days. The quickest response was received within 6 minutes, whereas the most delayed

response took nearly 37 days. The first response was received within 24 hours in 43.1% of cases, and 92.7% of eConsults were answered within the first week.

These global question types are outlined in Table I. Management questions were more prevalent (59.6%) than questions asking for assistance with diagnosis (39.4%). One consult (0.9%) could not be classified by question type as it asked multiple types of questions.

The content of the eConsults were broadly classified into one of three subspecialties: head and neck (48.6%), otology (31.2%), or rhinology (20.2%). Furthermore, each one was subcategorized based on the specific symptom or diagnosis. The most common topics were “oral mucosal lesions” and “thyroid nodule/goiter”; each represented

TABLE II.

Content Topics Identified in eConsults to Otolaryngology–Head and Neck Surgery.

Content Topic	Count
H&N–oral mucosal lesion	13
H&N–thyroid nodule/goiter	13
Rhinology–stuffy/runny rhinology, nasal congestion/discharge	8
H&N–sore H&N/tonsillitis	6
H&N–headaches/TMJ	5
Otology–vertigo/dizziness	5
H&N–neck mass/Lump	4
Otology–aural Fullness	4
Otology–mastoiditis	4
Otology–otalgia/earache/ear pain	4
Rhinology–smell disturbance	4
Otology - Tinnitus	3
Otology–tympenic membrane perforation	3
Otology–hearing loss	3
Otology–otitis externa	3
H&N–burning mouth	2
H&N–tonsillolithiasis	2
H&N–sleep disordered breathing/snoring/sleep apnea	2
H&N–voice change/hoarseness	2
Otology–otitis media	2
Rhinology–epistaxis/rhinology bleeds	2
Rhinology–nasal fracture	2
Rhinology–nasal pain/midfacial pain	2
Rhinology–postnasal discharge/drip	2
H&N–taste disturbance	1
H&N–xerostomia	1
H&N–lymphadenopathy	1
H&N–odynophagia/H&N pain/neck pain	1
Otology–ear foreign body sensation	1
Otology–hemotympanum	1
Otology–pruritic ear	1
Rhinology–septal perforation	1
Rhinology–neoplasm (rhinology/sinus/nasopharynx)	1

eConsults = electronic consultations; H&N = head and neck; TMJ = temporomandibular joint.

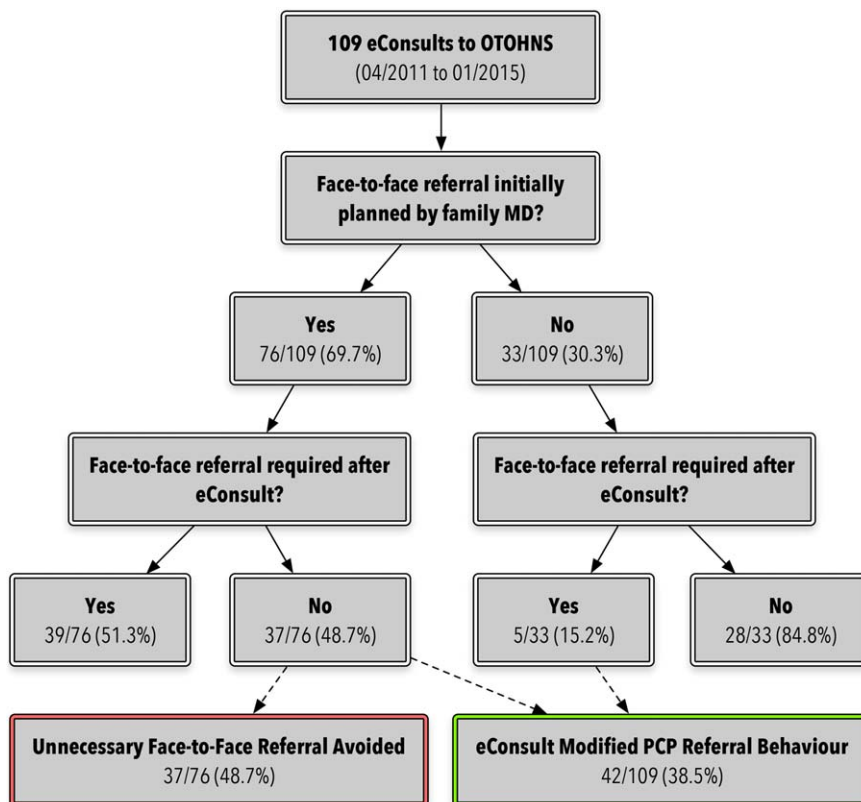


Fig. 2. Referral outcomes following the eConsult. OTOHNS = otolaryngology–head and neck surgery; PCP = primary care physician. [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

13/109 (11.9%) of all eConsults. A complete breakdown of content types is outlined Table II.

PCPs reported to have adopted a new or different course of action following the eConsult in 55/109 (50.4%) of the cases. As seen in Figure 2, the eConsults also had a significant influence on PCP referral behaviors. Nearly half of all patients who would have otherwise been referred to an otolaryngologist no longer required formal face-to-face assessment following the eConsult. Interestingly, a formal referral was recommended in 15% of cases where the PCP had initially felt a referral was not required. The details of these cases are highlighted in Table III. Overall, the eConsult process led to a modification in the PCP’s referral behavior in nearly 40% of cases.

The vast majority of PCPs were satisfied with the eConsult service. The eConsult was considered to be

valuable if it received a rating of either 4 or 5 on questions 3 and 4 of the postconsult survey. PCPs perceived the eConsult to be valuable for their patients in 88% of cases, and valuable for themselves 92% of the time. Furthermore, less than 3% (3/109) of responses were classified by the PCP as “not very useful.”

DISCUSSION

Our study is the first to review the role for eConsult in an OTO-HNS practice. The data from our pilot project reveal three major benefits to eConsult for otolaryngologists: improved communication with PCPs, reduction in unnecessary face-to-face consults (leading to decreased wait times), and potential to inform continuing professional development (CPD) for providers through analysis of the types of questions being asked by PCPs.

Effective Communication Tool

eConsult can be an efficient and effective form of communication between specialists and family physician. The median response time of 1.89 days is nearly 29 times shorter than traditional face-to-face consultation (1.89 days vs. 7.8 weeks). This highly valuable service resulted in PCPs pursuing a new or additional course of action, with more than 90% of eConsults receiving a response within the first calendar week. Over 50% (55/109) of eConsults in the study resulted in a new or additional course of action, meaning that these patients benefited directly from specialist consultation, despite a

TABLE III.

Cases Where Referral Was Not Originally Contemplated but eConsult Process Resulted in a Referral Being Initiated.

PCP Type	Patient Age, yr	Symptom Category
NP	55	Voice change/hoarseness
NP	35	Burning mouth
MD	46	Nasal pain/midfacial pain
MD	75	Oral mucosa lesion
MD	58	Thyroid nodule (goiter)

eConsult = electronic consultation; MD = medical doctor; NP = nurse practitioner; PCP = primary care physician.

waiting period. Additionally, PCPs are highly satisfied with the otolaryngology eConsult service, with over 90% finding it to be a valuable tool for referring physicians. One PCP described eConsult as “a very helpful service, giving timely help and input to the front-line generalist,” whereas another added that it helped them “be able to avoid unnecessary treatment for a patient.”

Reducing Wait Times

Wait times between referral and assessment by a specialist have steadily been on the rise for the past 20 years, with wait times in otolaryngology having nearly doubled in that time. Unfortunately, Canada lags behind other countries in this regard, with a 2010 survey ranking Canada lowest among 11 developed countries for wait times for specialist appointments and elective surgery.¹³ Multiple previous national polls have identified lengthy waits as the most commonly identified serious problem facing the Canadian health care system, with one recent survey finding that 94% of Canadians are either concerned or somewhat concerned about wait times to see a specialist.^{14,15} Furthermore, previous studies have shown waiting time to be a significant contributor to patient satisfaction,¹⁶ and a 2014 poll found that 47% of Canadians were dissatisfied with wait times.¹⁵ In our study, the use of eConsult prevented an unnecessary referral in 48.7% of cases where the PCP had initially planned a formal consultation. Prior studies in gynecology⁸ and endocrinology⁷ have found similar rates (34.3% and 45.5%, respectively). Although prolonged wait times are more common in countries that practice socialized medicine, they are not unique to these countries. Many regions in the United States also have significant wait time issues (particularly in safety net and accountable care organizations) and have also instituted eConsult as a solution to improve access.^{17,18}

Guiding CPD Development

Finally, the data from our study can help guide attempts at CPD development for family physicians. A common theme throughout the responses to question 5 of the postconsult questionnaire was the quality of teaching that this service provided for referring physicians. Interestingly, our study found that nearly a quarter of all eConsults directed toward otolaryngology pertained to one of two topics: thyroid disease or oral mucosal lesions. Although this is unsurprising given the relative diagnostic and therapeutic complexities surrounding these two entities, this presents an opportunity for specialists to help develop CPD opportunities for family physicians that focus on these high-yield diagnoses.

Potential Limitations

Despite the many benefits of eConsult, there are several potential limitations that could hamper its utility following a wide-spread rollout.

Many physicians are apprehensive to adopt new health information technology. Workflow and efficiency are major concerns for physicians,¹⁹ and previous

studies have shown that electronic medical record systems can be inefficient and result in increased documentation times.²⁰ Our study found that providing responses to eConsults required only a limited time commitment from otolaryngologists. Over three-fourths of the eConsults took the specialist less than 10 minutes to complete, with none taking longer than 20 minutes. It is our hope that these data should assuage any fears physicians may have regarding the efficiency of this process.

Another potential barrier is the financial costs associated with the development and implantation of an eConsult system. Although a true cost analysis of the eConsult process is beyond the scope of this article, several prior publications have found direct cost savings through avoided face-to-face visits as well as significant indirect cost savings for the patient when time and travel are included.^{21,22}

Finally, although eConsult may decrease the average wait times for the first phase of a referral (time from referral to first specialist visit) by reducing unnecessary consults, this service will not improve surgical wait times for our patients. In fact, by eliminating many unnecessary (and therefore nonsurgical) consults, otolaryngologists will likely see more surgical patients in a shorter period of time, a fact that could potentially result in longer surgical wait lists.

Medicolegal Ramifications

A common concern raised regarding the use of eConsults is the potential for medicolegal ramifications in the event of a diagnostic or therapeutic error that occurs over the course of an eConsult. As with any other informal or formal consultation, the eConsult specialist MD assumes a duty of care and must adhere to practice standards and is liable for the information/advice provided. Contrary to informal consultation, however, the eConsult system stores a permanent shared record of the discussion, including the clinical details and attachments provided by the family physician. Furthermore, the specialist has the option of advising a face-to-face visit where the case cannot be adequately answered by eConsult. Finally, it is up to the patients' PCP to decide whether to follow the recommendations, and they are responsible/liable for those actions or inactions.

CONCLUSION

Our study is the first of its kind to assess the feasibility, efficacy, and role of an electronic consultation system in an OTO-HNS practice. This system has been successfully implemented for nonurgent consults in our health region and has been shown to decrease unnecessary consults to our service. PCPs have exhibited a high degree of satisfaction with this service. Previous studies have demonstrated the cost efficiency of eConsult, but several limitations (including modifying the fee schedule for physicians to include eConsult) may need to be addressed prior to a successful widespread roll out of this service.

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