

Pathology perspective on gynaecologic malignancy screening questions in electronic consultation

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Abstract

Introduction: The electronic consultation service, eConsult, is an asynchronous web-based platform for provider-to-provider consultation with specialists. This study described the utilization of eConsult by primary care providers to obtain specialist opinion in gynaecologic malignancy screening, with a specific focus on pathology-related inquiries.

Methods: This is a cross-sectional retrospective review of eConsults submitted to obstetrics/gynaecology between September 2011 and December 2016. All questions pertaining to gynaecologic cancer screening and their pathologies were included. Each question was classified based on a pre-determined taxonomy. The mandatory primary care providers' exit surveys were analysed to determine eConsult's influence on patient care, primary care providers' referral patterns, primary care providers' satisfaction and educational value.

Results: In total, 1,357 electronic consultations were submitted to the obstetrics and gynaecology service during the study period, of which 329 met inclusion criteria. Indications for a screening test based on patient risk factors made up 36% of consults pertaining to gynaecologic malignancy screening and 17% were inquiries about test intervals based on previous results. Primary care providers pointed out gaps in current screening guidelines. In total, 38% of primary care providers reported the eConsult service helped avoid a specialist referral, whereas 47% of primary care providers received new or additional courses of action. Pathology report interpretation accounted for 5% of eConsults and 6% of primary care providers wished for clarification of incidental pathology findings.

Conclusion: This study uncovered areas of uncertainty among primary care providers regarding gynaecologic cancer screening and gaps in current clinical guidelines. Furthermore, the role of pathology consultants in an eConsult platform is explored and may be extrapolated into practice.

Keywords

Gynaecologic oncology screening, pathology, electronic consultation

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Introduction

Prolonged waiting times to see specialists remain a major issue in the Canadian healthcare system. In fact, waiting for medical care has been coined the 'defining characteristic' of Canada's healthcare system.¹ In comparison to 10 other countries, including the United States, Canada ranked last in wait times for specialist care and this has not improved over time.² Wait times for specialist assessment and treatment have risen.¹ Excessive wait times are associated with increased anxiety, stress, pain and negative impacts on patients' quality of life³ and may result in poorer

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outcomes, as potentially reversible conditions transform into irreversible chronic disabilities.^{1,4} Delayed healthcare access also poses an economic burden due to increased absenteeism of the patient as well as their caregivers.⁴ Overall, waiting for medically indicated treatments is associated with increased all-cause mortality.⁴

Electronic consultation (eConsult) has been proposed as a potential solution to prolonged wait times for specialist consultation. An eConsult service involves asynchronous communication occurring through a secure electronic system, wherein primary care providers (PCPs) submit questions with patient-specific information. The specialist can view and answer these consults at their convenience, in many cases providing sufficient guidance to make a face-to-face referral unnecessary.⁵ PCPs have reported that eConsults can improve clinical care, provide timely access to specialists, confirm diagnoses and offer educational benefits.^{5,6} Specialists have expressed their enthusiasm for this platform, which has promoted the efficiency of clinical appointments and helped ascertain referral questions and reduce disruptions by telephone and pager.⁵ eConsults have also curtailed wait times for specialist consultations, avoiding the need for formal consultation, and provided useful feedback to PCPs.⁵⁻⁷ The utilization of eConsults in paediatric services also has the potential to reduce parental and caregiver costs associated with face-to-face specialist consultations.⁸

To our knowledge, pathologists are not directly accessible by PCPs through eConsult platforms in Canada. However, PCPs may have questions, such as about the interpretation of pathology reports that may be best directed at pathologists. For example, gynaecologic cancer and its screening rely on pathologic diagnoses, making these areas where direct input from pathologists could be invaluable. There is a paucity of literature on the involvement of surgical pathologists in eConsult platforms with PCPs. However, pathologists are not unfamiliar with innovative asynchronous communication systems such as telepathology, which facilitates consultation between pathologists of various subspecialties and geographic regions.⁹ Studies have reported similar benefits of telepathology as eConsults.^{9,10} Consultations with pathologists submitted by clinicians (non-pathologists) and patients in China via telepathology have been described in the literature.¹⁰

Our study aims to analyse the utilization of the eConsult service by PCPs to obtain specialist opinions in gynaecologic malignancy screening. By focusing on pathology-related inquiries, we hope to shed light on the type of questions PCPs ask around gynaecology malignancy screening and diagnosis and understand if

there is a potential role for pathologists as consultants on the eConsult platform.

Methods

Design

We conducted a cross-sectional retrospective review of eConsult cases submitted to obstetrics/gynaecology.

Setting

The Champlain BASE eConsult service was implemented in the Champlain Local Health Integration Network in Ontario, Canada in 2010.¹¹ To use the service, the PCP logs in with an individual account, enters their clinical questions into a standardized electronic form and selects the desired specialty service from 114 available specialty groups. A case manager assigns the case to a specialist from the selected group based on availability. In the case of obstetrics/gynaecology, selection is between two participating specialists. The assigned specialist is given 1 week to respond to the case. They may provide an opinion, request more information, or recommend a formal referral (which may include suggestions for pre-visit workup to facilitate a more effective visit). The PCP is notified of the specialist's response via email. After reviewing the specialist comment, the PCP has the option of either posting follow-up questions or closing the case. Once the PCP closes the case, they complete a brief mandatory close-out survey regarding their experience. Specialists are remunerated at a rate of \$200/hour prorated to their self-reported billing time. From the medico-legal perspective, the duty of care in an eConsult case is congruent with that of 'kerbside' consultations by the Canadian Medical Protective Association.¹¹

Participants

The study included all cases submitted to obstetrics/gynaecology between 1 September 2011 and 31 December 2016 that pertained to cervical cancer screening with pap tests and endometrial cancer diagnosis with endometrial biopsies.

Data collection

All cases submitted to obstetrics/gynaecology during the study period were collected and reviewed. All obstetric consults were excluded. Inquiries on ovarian and vulvar cancer screening were excluded, as there are no standardized evidence-based screening tests.^{12,13} Consults related to benign gynaecology were also excluded.

The included cases were anonymized then reviewed independently by a medically trained author (CW).

Communication logs and relevant attachments were reviewed and cases were classified per a pre-determined taxonomy based on the types of questions asked (Table 1). The taxonomy used was reviewed by two clinicians (EK and CL) and one surgical pathologist (SI). Each case may have up to two classifications given the complexity of certain eConsults.

Patient demographics (gender and age) and PCP type (physician or nurse practitioner) were extracted. Consultation-related data including consult submission time, time of first specialist response and specialist's self-reported time to answer were documented. PCPs' responses to a mandatory closeout survey were also collected. Each survey consisted of five questions, which inquired about patient outcomes, whether eConsults changed the trajectory of a potential formal referral and the perceived value of the eConsult service. Two questions in the exit survey were changed in October 2016, following which PCPs were also asked to rate the case's educational value and relevance for translation of knowledge into educational material for continued medical education events (CME). PCPs have the opportunity to provide written feedback through the exit survey. The data were de-identified and exported into Excel for analysis. The project was approved by the Ottawa Health Science Network Research Ethics Board (2009848-01H).

Results

Among the 21,050 eConsult cases submitted during the study period, 1357 (6%) were directed to obstetrics/gynaecology, of which 329 (24%) met inclusion

criteria. These cases were submitted by 206 PCPs. Of note, 24 of the excluded eConsults pertained to gynaecologic malignancies other than cervical cancer screening and endometrial cancer diagnosis (Figure 1). Inherent to the nature of the specialty, all of the patients were female, with an average age of 51.4 ± 13.2 years (range 17.1–93.7 years). Overall, 90% of eConsults were submitted by physicians, whereas 10% were submitted by nurse practitioners. The average time for the PCP to receive the initial response from the specialist was 2.9 ± 2.5 days (range 0.01–14.2 days). Time required by specialists to complete the eConsult was less than 10 minutes in 36%, 10–15 minutes in 50%, 15–20 minutes in 8% and >20 minutes in 6% of consults.

Among the 329 submissions included in this study, 177 pertained to endometrial cancer diagnosis, 149 to cervical cancer screening and three to both. The types of questions asked are presented in Table 1. The most frequently asked type of question involved indications for a screening test for cervical cancer and diagnostic test for endometrial cancer, specifically whether these tests are indicated based on patient risk factors and clinical presentation (36%). Inquiries on the next appropriate course of action based on initial test results were also prevalent, including the time interval of subsequent test (17%), whether to repeat the initial test (11%) and indication for other diagnostic tests (10%). Questions about endometrial cancer diagnosis included a request for guidance on investigations for asymptomatic endometrial thickening, especially in pre-menopausal women and patients taking tamoxifen;

Table 1. List of eConsult topics and their frequency distributions.

Types of questions	Number of consults per classification	% of total classifications reviewed (n= 399)
Screening test		
• Indication for type of screening or diagnostic test	9	2.2
• For whom the screening or diagnostic test is indicated (based on risk factors, clinical presentation, family history)	142	35.6
• Testing interval for test-naïve patients	5	1.3
• Cessation of screening test	22	5.5
• Instruction on screening or diagnostic test technique	5	1.3
• Clarification of whether adequate sample was taken	5	1.3
• Need to repeat same initial test?	43	10.8
Pathology report		
• Interpretation of terminology used in pathology report	20	5.0
• Clarification of clinical implications of incidental findings on pathology	23	5.7
Follow-up of screening result		
• Need other diagnostic testing	40	10.0
• Subsequent screening test interval based on initial results	67	16.8
Therapy recommendations	18	4.5

eConsult: electronic consultation.

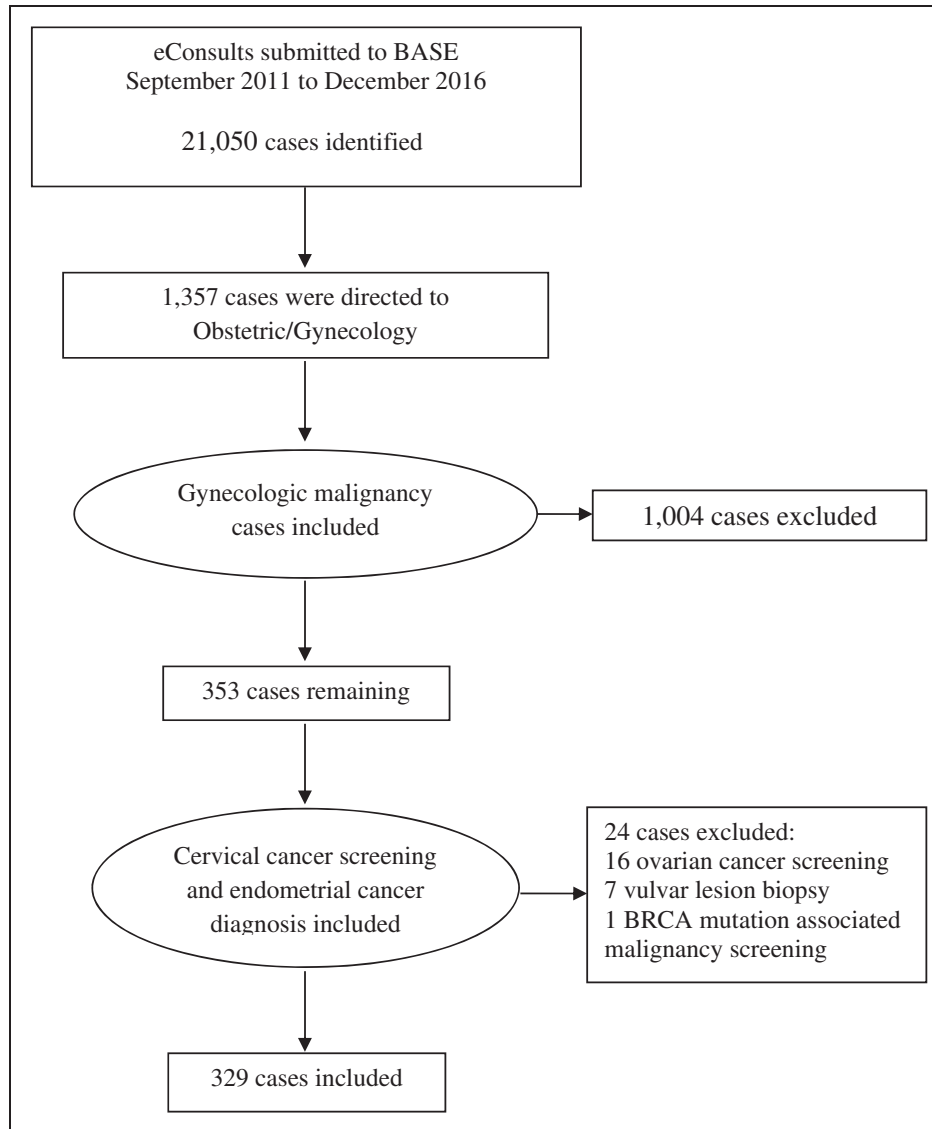


Figure 1. Gynaecologic cancer screening electronic consultation (eConsults) case selection based on study criteria.

post-menopausal bleeding with normal endometrial thickness on ultrasound; post-menopausal bleeding in women on hormone replacement therapy; and abnormal vaginal bleeding in perimenopausal women. The most frequent eConsults involving pap tests pertained to clinical scenarios that deviated from the algorithm provided by existing Canadian cervical cancer screening guidelines: frequency of screening following treatment for dysplasia or discharge from colposcopy, whether pap tests of the vaginal vault are necessary following total hysterectomy for benign or malignant aetiologies and when to terminate cervical screening in 70-year-old patients with cervical dysplasia within the last 10 years.

Overall, 11% of questions were about the interpretation of pathology reports, where 5% inquired about

terminology clarification and 6% wished for explanation of clinical implications of incidental findings on pathology. Examples of PCP inquiries regarding pathologic terminology are outlined in Table 2. PCPs sought guidance on the clinical implications of incidental findings such as glandular-like cells identified on pap test in a 'post-hysterectomy patient', detection of endometrial cells on a pap test and the presence of *Actinomyces* on pap tests in patients with intrauterine devices. Furthermore, PCPs asked about technical aspects of performing pap tests such as pre-treatment of an atrophic cervix with topical oestrogen prior to test acquisition to minimize the detection of atypical cells secondary to atrophy. Questions related to adequacy of tissue acquisition, including sampling of the transformation zone for pap tests, were also submitted.

Table 2. Examples of eConsults pertaining to interpretation of pathologic terminologies.

Pap test	Endometrial biopsy
'Cellular changes associated with inflammatory effects'	'Weak proliferative-type endometrium with stromal breakdown'
'Cellular changes associated with keratinization'	'Extensive stromal pseudodecidualization and glandular atrophy'
Presence of 'reactive endocervical cells'	'Disordered proliferative endometrium with benign endometrial polyp'
Presence of 'psammoma bodies'	'Secretory endometrium with discordant glandular-stromal maturation'
Presence of 'atypical endocervical cells'	'Benign proliferative endometrium with focal tubal metaplasia'
Presence of 'benign reactive endocervical cells'	
Presence of 'benign reactive squamous cells'	
Presence of 'atypical glandular cells of endometrial origin, not otherwise specified'	
Presence of 'benign non-specific cellular changes'	

eConsult: electronic consultation.

Table 3. Exit survey question regarding the impact of eConsults on patient care.

Which of the following best describes the outcome of this eConsult for your patient?	Frequency per choice	% (<i>n</i> = 329)
1) I was able to confirm a course of action that I originally had in mind	170	51.7
2) I received good advice for a new or additional course of action	155	47.1
3) I received good advice for a new or additional course of action that I am not able to implement	3	0.9
4) None of the above (please comment)	1	0.3

eConsult: electronic consultation.

Specialists provided education on indicators of insufficient sampling on the pathology report, such as 'insufficient for diagnosis' or 'tissue representative of lower uterine segment only and as such further pathology cannot be ruled out'.

The impact of eConsult on PCP behaviour based on the exit survey is presented in Table 3 and Figure 2. The survey questions were modified in 2016 to better evaluate the educational value of eConsults. The academic potential of eConsult was recognized by PCPs. On a Likert scale of one to five, 95% (*n* = 232) of PCPs gave ratings of four or higher when asked about the educational potential of specialist responses to guide their patient care. Similarly, 91% (*n* = 232) of PCPs gave these ratings on inquiry about whether eConsults addressed a clinical problem that should be incorporated into CME curricula. PCPs stated 'I always learn something new with eConsult' and 'my question was answered clearly, and some additional teaching was thrown in which is always appreciated'. Specific to gynaecologic cancer screening, PCPs pointed out eConsults were 'very helpful for situations not addressed by guidelines'. Deficiencies in current guidelines were also uncovered: 'The Canadian Cervical Cancer Screening guidelines do not deal with unusual conditions or situations. This makes decision making challenging and it would be helpful for guidelines to

address an approach to these situations', and 'I have had a hard time finding concise guidelines which clarify when people with dysplasia can return to routine screening'.

The eConsult service was rated highly by PCPs. On a Likert scale of one to five, 99% (*n* = 97) of PCPs gave ratings of four or higher when asked about the overall value of eConsults for their patients and PCP themselves, respectively. The unique benefits of eConsults were conveyed by PCP comments. One PCP reported eConsults 'helped adjust my overall practice... based on the advice provided', whereas another felt reassured by the specialist's 'valuable assurance that I was on the right path with a relatively new medical option that I was not very familiar with'. The potential advantage of eConsult compared to formal clinic referrals was captured in a PCP's comment: 'thank you for assisting me in providing care for this patient who is really in no condition to attend an outpatient appointment'.

Discussion

This study assessed PCPs' inquiries about gynaecologic cancer screening on a secure web-based eConsult platform from a pathology perspective. The most commonly submitted questions by PCPs pertained to indications for a screening or diagnostic test based on

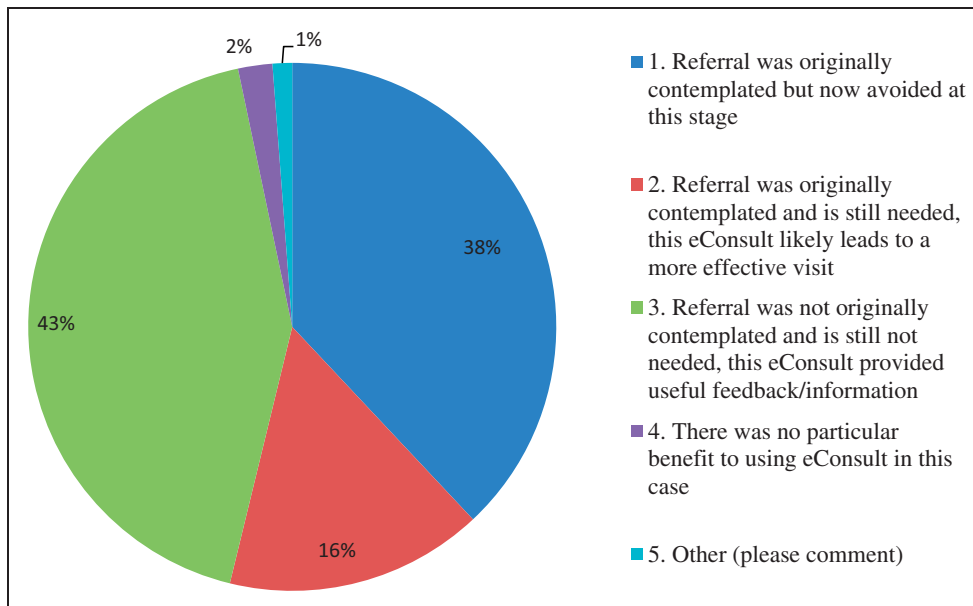


Figure 2. The impact of electronic consultation (eConsults) on primary care provider behaviour (N = 329).

patient risk factors, subsequent test intervals based on previous test results and whether to repeat the initial test or pursue other diagnostic modalities. Several gaps in knowledge and areas of uncertainty towards gynaecologic cancer screening and diagnosis among PCPs have been uncovered. These inquiries may be utilized to generate topics for future CME events. Our results echoed other studies that have demonstrated the eConsult service is highly valued by PCPs and affected their referral patterns.^{6,7,14}

We have chosen to focus on cervical cancer screening and endometrial cancer diagnosis based on validated screening and diagnostic methods and available guidelines for these gynaecologic malignancies.^{15–17} With regards to cervical cancer screening, PCPs often asked for clarification of the clinical significance of detecting endometrial cells or atypical glandular cells on pap tests. Questions about endometrial cancer diagnosis, especially pertaining to asymptomatic endometrial thickening, abnormal vaginal bleeding in perimenopausal women and management of post-menopausal bleeding with normal endothelial thickness, were frequent. Although these clinical questions have been addressed in various included guidelines,^{16–19} misalignments remain between guidelines and PCPs' interpretation and application of them for patient care. PCPs' perplexity towards cervical cancer screening and endometrial cancer diagnosis may have stemmed from unfamiliarity with current clinical practice guidelines, deficits in existing guidelines, challenges in adapting to guideline updates and disparities in guidelines. For example, PCPs' questions around when patients with cervical dysplasia can

return to routine screening intervals suggest the current Cancer Care Ontario guidelines, which give the colposcopist the responsibility of making recommendations for appropriate follow-up screening intervals based on patient's risk status following discharge from their care,²⁰ need to be revisited or better communicated. In addition, recommendations for surveillance after hysterectomy for cervical dysplasia/carcinoma and when to discontinue screening in such patients will help inform PCPs and empower them to facilitate a smooth transition in care after the patient has been discharged from the specialist. In addition to providing access to specialist recommendations regarding these clinical questions, PCPs also receive answers tailored toward each patient's situation through the eConsult platform.

Shifts in practice in cervical cancer screening precipitated discordant guidelines on the age of commencement for pap testing by key leading organizations.^{15,20–22} The uncertainties that stem from evolving cervical cancer screening guidelines have been demonstrated in Pennsylvania, where there was a drastic increase in over-screening from 6% to 67% in patients under 30 years old following a guideline update.²³ These adverse outcomes may be mitigated by providing a platform such as eConsult, where specialists can guide PCPs through periods of transition. Results of the exit survey have confirmed the vast majority of PCPs recognized the educational value of a platform that can refresh their knowledge of practice guidelines, address uncertainties of existing guidelines and help build PCP capacity for managing similar patients in the future. eConsult data can identify areas of uncertainty, should be fed back to

guideline developers and may be used to plan CME events.

Surgical pathology has yet to actively participate in the eConsult service, which currently provides consultation with 114 specialty services. In the current era of team-based medical practice, the pathologist's role has expanded to include education and providing clinical consultation to guide patient care.^{24,25} Although well defined within the realm of pathology, the language of pathologists is not always easy to understand and may be subject to interpretation errors. Previous studies of informal pathology referrals have demonstrated a 30% discordance between pathologists and surgeons on pathology report interpretations.²⁶ Clinicians have overcome uncertainties of interpretation by kerbside consultations, specialist reports and novel informal pathologist consultations such as telephone consultation services.^{27,28} A study of the Path on Call telephone consultation service demonstrated 96% of requests involved test interpretation and discussion of clinical implication of the results.²⁷ Similar to the eConsult service, the MyPathologist electronic tool provided a single-centred platform for direct consultation with pathology resident on-call and the supervising pathologist.²⁴ The most frequent types of inquiries included test result interpretation, test utilization and quality control.²⁴ Aside from facilitating timely access to pathologists, the educational value for both the submitting healthcare provider and pathologist resident were emphasized.²⁴ These studies, together with our own data, suggest there could be a role for the pathologist to participate in eConsult services. In addition, eConsult questions should be used to reinforce the importance of clear reporting and highlight areas where PCPs could use further clarification/education.

Our study has several limitations. Firstly, this is a single institution study, limiting the generalizability of its results. Secondly, patient outcomes and satisfaction were not assessed. Positive patient experiences and acceptance of eConsult by patients have been described in previous research.²⁹ In addition, we focused on gynaecologic cancer screening to examine eConsults from both the pathology and gynaecologic oncology perspectives. Assessments of eConsults in other specialties with heavy reliance on tissue-based diagnoses such as medical oncology and dermatology may better delineate the benefits of pathology consultants in this service. A similar analysis of eConsults in these specialties may help refine the role of pathologist consultants in these asynchronous web-based platforms.

Conclusions

The implementation of an eConsult service has provided asynchronous communication between specialists

and PCPs in various specialties spanning medicine and surgical subspecialties. However, pathologists have not yet taken an active role in this platform. This study demonstrated that PCPs have clinical questions that may be best answered by a pathologist. In addition, several gaps in knowledge and areas of uncertainty towards gynaecologic cancer screening and diagnosis amongst PCPs have been uncovered and may perhaps help generate CME topics. Finally, our results reinforced the benefits conferred by eConsults to patient care and healthcare system as a whole.

Authors contributions

AA, EK and CL co-developed the eConsult service; EK and CL conceived and initiated the research; AA, CL, CW, EK, FS, GP and SI designed the research, analysed and interpreted the results, and wrote and approved the manuscript. CL guarantees this manuscript.

Declaration of conflicting interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: the authors declare no competing financial interests. CL and EK are Co-Executive Directors of the Ontario eConsult Centre of Excellence, funded by the Ontario Ministry of Health and Long-term Care. They co-founded the Champlain BASE™ eConsult service but do not receive any reimbursement or retain any proprietary rights. EK answers eConsults through the service less than once per month.

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Ethics approval

The Ottawa Health Science Network - Research Ethics Board approved this research (Approval # 2009848-01H).

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