

ORIGINAL RESEARCH

## A comparison of referral patterns to a multispecialty eConsultation service between nurse practitioners and family physicians: The case for eConsult

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### Keywords

Primary care, nurse practitioners; telemedicine; research; electronic consultation; referrals; patterns of referral.

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### Abstract

**Purpose:** To explore referral patterns of nurse practitioners (NPs) and family physicians (FPs) using an electronic consultation (eConsult) service, and assess their perspectives on the service's value to their patients and themselves.

**Data sources:** A mixed methods study including a cross-sectional analysis of utilization data drawn from all eConsults completed from April 15, 2011 to September 30, 2014, and a content analysis of NP survey responses completed from January 1 to September 30, 2014.

**Conclusions:** A total of 4260 eConsults were included in the cross-sectional analysis (3686 from FPs and 574 from NPs). In our sample, NPs directed more cases to dermatology and fewer cases to cardiology and neurology ( $p < .0001$ ) than did FPs, and were more likely to report that an eConsult led to new advice for a new or additional course of action (62.8% vs. 57.5%) and less likely to report it resulted in an avoided referral (35.5% vs. 41.8%,  $p = .005$ ). NPs reported slightly higher levels of perceived value of eConsults for their patients and themselves.

**Implications for practice:** Differences in use and impact of eConsult exist between NPs and FPs. NPs value the service highly for their patients and themselves. The service reduces potential inequities related to outdated payment and scope of practice policies.

### Introduction

Excessive wait times for specialist appointments pose a significant barrier to patient care and have been associated with lower health status and poor patient outcomes (Canadian Institute for Health Information, 2012). Wait times are a serious issue in many countries across the developed world, particularly Canada and the United States. A 2013 Commonwealth Fund study examined issues pertaining to healthcare access in 11 developed countries. Compared to other participating countries, the United States and Canada reported significantly higher wait times for primary care and greater levels of emergency department use (Schoen, Osborn, Squires, & Doty, 2013). In regard to wait times for specialist care, the United States fared better than Canada (which ranked lowest

of the 11 participating countries). Seventy-six percent of American patients waited less than 4 weeks for a specialist appointment versus 39% of Canadian patients. However, American patients without private insurance still faced inequitable access and were more likely to forego care because of costs (Schoen et al., 2013).

Nurse practitioners (NPs) and family physicians (FPs) both provide primary care services to their patients. Studies have shown that the care provided by both groups is comparable in quality (Dierick van Daele, Metsemakers, Derckx, Spreeuwenberg, & Vrijhoef, 2009; Keleher, Parker, Abdulwadud, & Francis, 2009; Rohrer, Angstman, & Garrison, 2012; van Soeren, Hurlock-Chorostecki, Goodwin, & Baker, 2009). However, NPs face some restrictions on their scope of practice that may influence referral patterns and access to specialist advice (Christian,

Dower, & O'Neil, 2007; Donald et al., 2010; van Soeren et al., 2009). These restrictions vary by region and can include reduced powers of prescription and referral, mandatory physician oversight when practicing, and lower rates of compensation for specialists who accept referrals from NPs directly without having an FP sign off on the referral (Christian et al., 2007; Health Professional Regulatory Advisory Council, 2014; Nurse Practitioners' Association of Ontario [NPAO], 2012; Yee, Boukus, Cross, & Samuel, 2013).

Organizations in both Canada and the United States have questioned the validity of these limitations, noting their negative effect on healthcare costs, access, and overall quality of care (Christian et al., 2007; NPAO, 2012; Yee et al., 2013). In response to these concerns, there is a need to explore differences in practice behaviors between NPs and FPs. Randomized controlled trials examining differences in care and cost-effectiveness between NPs and FPs found similar referral rates for both groups (Kinnersley et al., 2000; Venning, Durie, Roland, Roberts, & Leese, 2000). However, few studies have compared NP and FP patterns of specialist referral.

In 2010, the Champlain BASE (Building Access to Specialists through eConsultation) eConsult service was implemented in Eastern Ontario, Canada, to improve access of primary care providers (PCPs) to specialist advice. NPs and FPs who use the eConsult service have equal access to the service and there is no difference in the reimbursement of the specialists (Liddy, Rowan, Afkham, Maranger, & Keely, 2013). The eConsult service provides a unique opportunity to examine differences in referral patterns between NPs and FPs. This article has two main objectives: (a) to report on patterns of electronic consultation between NPs and FPs who used the eConsult service, and (b) to assess any differences in the opinions between NPs and FPs on the eConsult service's value to patients and themselves.

## Methods

### Study design

This study uses a mixed methods approach. This approach includes (a) a cross-sectional study of all eConsults completed by PCPs between April 15, 2011 and September 30, 2014, and (b) a content analysis of eConsults completed exclusively by NPs between January 1 and September 30, 2014.

### Healthcare system

The healthcare system in Canada is publically funded and freely available to all Canadians. There are a variety

of payment models for FPs, NPs, and specialists, including traditional fee-for-service practices, capitated practices, and blended models. In Ontario, the majority of specialists operate in a fee-for-service model, and PCPs in capitated or blended models. Only the specialist is remunerated for a referral.

### The eConsult service

The eConsult service is a secure web-based asynchronous referral platform that connects PCPs with specialists. Detailed information on the platform's design has been published previously (Liddy et al., 2013). In brief, PCPs (NPs or FPs) use a standardized electronic form to submit a patient-specific clinical question, which may also include supplementary information (e.g., digital images, test results, and health histories). A designated assigner directs the question to an appropriate specialist, who receives a notification by e-mail. Specialists respond to questions within 1 week. Depending on the nature of the request and the information provided, specialists may (a) provide recommendations for care (thereby avoiding a face-to-face consultation), (b) request additional information, or (c) recommend a formal referral. Preliminary results of the pilot have been promising, with PCPs reporting the service as highly beneficial in 90% of cases, and resulting in an avoided unnecessary referral in 43% of cases (Keely, Liddy, & Afkham, 2013).

### Participants

All FPs and NPs who were registered to use the eConsult service and had completed at least one eConsult during the study period were included in the cross-sectional study. For the content analysis, all NPs who are registered to use the service and completed at least one eConsult between January 1 and September 30, 2014, were included.

### Setting

The Champlain Local Health Integration Network (LHIN) is one of 14 regional health districts in Ontario, Canada. It is a culturally diverse region with a population of 1.2 million people. Chronic disease burdens and patient health outcomes in the Champlain LHIN are comparable to those of Ontario and the rest of Canada (Bains, 2008). One tertiary care hospital with three campuses provides the majority of specialty services to residents of the region.

### Data collection

The eConsult service collects real-time utilization data from all PCPs who use the service. These data include the

specialty referred to, the number of eConsults the PCP submitted, a log of the discussion between providers, specialist response time and provider type, and the outcome of the eConsult (i.e., avoided referral, scheduled referral, additional information requested). The only patient information collected is gender and date of birth. PCPs' practice models (e.g., Community Health Centre, Family Health Team) were ascertained through publically available information resources (e.g., practice websites).

At the conclusion of each eConsult, PCPs complete a mandatory five-question close-out survey (Figure 1). Question 1 asks about the perceived usefulness of the advice the PCP received from the eConsult. Cases where the PCP chose "none of the above" were excluded because they only made up 1.4% ( $n = 60$ ) of the total cases. Question 2 asks about the result of the eConsult in regard to referral. PCPs can choose one of six options ranging from the avoidance of a face-to-face visit to no benefit. These responses were collapsed into a dichotomous variable identifying whether or not the PCP felt that a face-to-face specialist visit had been avoided as a result of the eConsult. Therefore, the responses "referral still not needed," "referral still needed, but eConsult led to a more effective future visit," "new referral," "no benefit," and "other" were all considered as referral not avoided. Questions 3 and 4 are

**Q1: Which of the following best describes the outcome of this eConsultation for your patient?**

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

**Q2: As a result of the eConsultation 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/instruction
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 explain)

**Q3: Please rate the overall value of the eConsult service 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:**

**Figure 1** Close-out survey administered upon completion of each eConsult.

answered on a 5-point Likert scale and ask PCPs about the value of the service for their patients and themselves, respectively. The final question (optional) is open text and asks PCPs to leave any written comments they have about the eConsult service.

## Analysis

**Cross-sectional analysis.** Utilization and survey data were used to identify differences between provider type and the following: (a) the perceived usefulness of the eConsult, (b) how often referrals were avoided, and (c) the specialty referred to. Responses to questions 3 and 4 (the PCP's perceived value of eConsult for patients and themselves) were tabulated to calculate mean satisfaction scores separately for each provider type. Only specialty services that received at least 3% of the total number of eConsults were included. This included 79.9% ( $n = 3402$ ) of the total number of completed cases.

**Content analysis.** In order to offer a more detailed perspective of NPs' perspectives on the eConsult service, the research team conducted a content analysis on a subset of NPs' responses to question 5 of the close-out survey (an optional open-text question), using a constant comparison approach. Only eConsults completed by NPs were included in the content analysis. Two members of the research team reviewed the open-text responses individually, using a previously established framework. This framework was created through a thematic analysis conducted by the authors and research team on all PCP comments captured by the eConsult service. Themes were identified by two members of the research team, who coded the data independently. The themes were then refined using a constant comparison approach. (Liddy, Afkham, Drosinis, Joschko, & Keely, 2014). The team members met regularly with one another to compare and refine codes through an iterative process, and with the rest of the team to obtain consensus on the codes and resolve any conflicts.

Statistical testing was done using  $\chi^2$  and  $t$ -tests where appropriate. All analyses were done using SAS version 9.4. This study was approved by the Ottawa Health Science Network Research Ethics Board (protocol 2009848–01H).

## Results

### Cross-sectional analysis

During the study period for the cross-sectional analysis, PCPs submitted 4265 eConsults to 45 different specialty groups. Five eConsults included missing information or were administrative duplicates and were excluded. A total of 4260 eConsults were analyzed, of which 574 were submitted by 63 different NPs and 3686 by 281 different

**Table 1** Characteristics of NPs who use the eConsult service

Characteristic	NP (n = 63)	FP (n = 281)
Gender percentage (no.)		
Female	84.1 (53)	70.8 (199)
Practice location percentage (no.)		
Urban	87.3 (55)	92.2 (259)
Practice model percentage (no.)		
Community health center	54.0 (34)	16.0 (45)
Family health team	31.7 (20)	42.0 (118)
Family health organization	–	11.4 (32)
Fee for service	–	30.6 (86)
NP-led clinic	14.3 (9)	–

FPs. The majority of NPs were female and worked in urban areas (see Table 1 for demographic information).

**Association between provider type and specialty, type of advice, and referral avoidance.** The analysis included the top-12 most popular specialties (i.e., those that received at least 3% of the total number of cases). This subset of our data comprised 3402 eConsult cases. A statistically significant difference was found between the types of specialty FPs referred to compared to NPs ( $p < .0001$ ). NPs directed a higher proportion of eConsults to dermatology, whereas FPs directed more eConsults to cardiology and neurology (Figure 2).

FPs and NPs also differed in terms of the type of advice they received (Table 2). NPs were more likely to report that they had received new advice for a new or additional course of action compared to FPs, and less likely than

**Table 2** Differences between perceived value of eConsult for providers and patients, outcome of eConsult, and referral avoidance between FPs and NPs

Questions from eConsult close-out survey (n = 4260)	Provider Type		p-Value for difference <sup>a</sup>
	NP	FP	
Perceived value for patients (mean [SD])	4.67 (0.61)	4.61 (0.79)	0.016
Perceived value for providers (mean [SD])	4.76 (0.55)	4.66 (0.75)	0.0003
Proportion of referrals avoided	35.5%	41.8%	0.005
Outcome of eConsult (n = 4200)			
Confirmed course of action	35.5%	39.9%	0.04
Received new advice	62.8%	57.5%	
Response not useful	1.8%	2.6%	

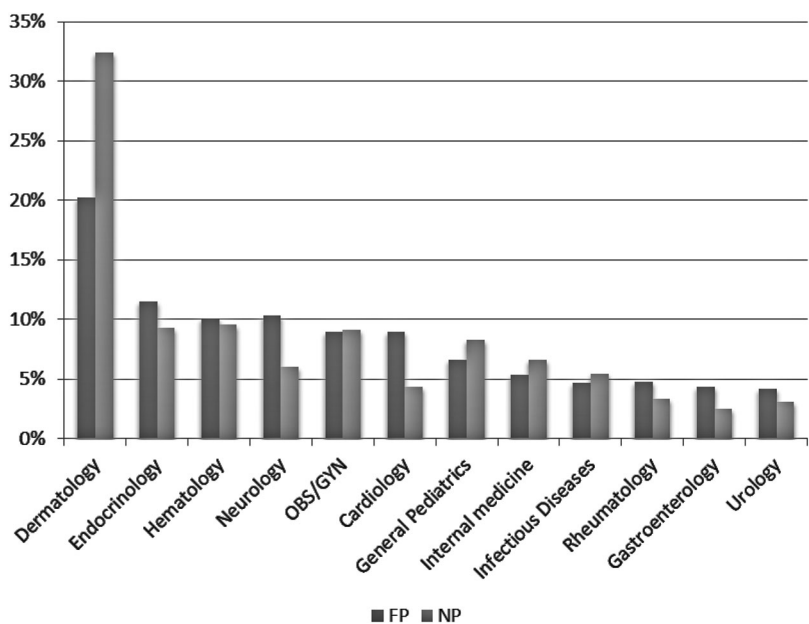
<sup>a</sup>Statistical testing done using t-tests or  $\chi^2$  test where appropriate.

FPs to report that an eConsult had resulted in an avoided referral.

**Differences in value of eConsult for patients and PCPs.** Both groups of PCPs gave the eConsult service very high ratings (Table 2). However, NPs gave higher ratings than FPs when expressing the eConsult service’s value for their patients ( $p = .016$ ) and themselves ( $p = .0003$ ).

**Content analysis**

In total, 29 NPs submitted 74 open-text comments during the content analysis study period. NP comments fell into the three major themes outlined by our established



**Figure 2** Specialty distribution between FPs and NPs (n = 3402).

framework: NP perceptions of service, the use of eConsults to improve patient care, and adoption of technology.

NPs' responses to the eConsult service were overwhelmingly positive. The vast majority of comments expressed high levels of satisfaction with the service, with many NPs remarking specifically on its quick response times, its helpfulness, and the high caliber of specialist advice they received. NPs were impressed with the quality of specialist advice, but also with specialists' demeanor: "really kind tone from Dermatologist . . . I appreciate their collegiality and professionalism." Several NPs also valued the reassurance the eConsult service provided, allowing them to confirm a suspected diagnosis or treat a patient with greater confidence.

In addition to finding the eConsult service helpful in reassuring themselves in their course of action, several NPs mentioned that the service helped them reassure their patients about their treatments as well: "It's very efficient for all parties, and useful service. Quick reassurance for patient and provider!" A few NPs saw their electronic conversations with specialists as a great learning opportunity, allowing them to improve the quality of care they offered to the patient whose case was being discussed and educating them on practices to apply to future patients with similar conditions: "answered my question for this clinical case, and now I can apply information to other similar cases."

A small number of NPs described technical challenges with the service, including low resolution of attached pictures and trouble with e-mail notifications. A few NPs noted instances where a referral was still required, although one NP noted that the eConsult was nevertheless useful as it "likely leads to a more effective visit."

## Discussion

Our study found several differences in referral patterns, referral outcomes, and perceived benefits of eConsult between NPs and FPs. A greater percentage of NPs referred patients to dermatologists, while FPs were more likely to refer patients to cardiologists and neurologists. Compared to FPs, NPs were more likely to receive new advice, and had lower rates of referral avoidance. Both FPs and NPs reported very high levels of satisfaction with the eConsult service. However, NPs reported slightly but significantly higher perceived value for both their patients and themselves, although we should note that the number of NPs participating in our study was much smaller than the number of FPs. This may reduce our ability to accurately compare their responses. The high levels of NP satisfaction found in our cross-sectional analysis were also reflected in our content analysis. Specifically, NPs remarked on the

speed, helpfulness, and quality of specialist responses, and noted the service's ability to reassure patients and serve as an educational tool.

To our knowledge, little research has been conducted examining the use and impact of electronic consultation services between NPs and FPs. Previous studies examining traditional referral have had conflicting results on whether there are differences between NPs and FPs with respect to referral patterns. Systematic reviews by Horrocks et al. (Horrocks, Anderson, & Salisbury, 2002) and Laurant et al. (Laurant et al., 2005) explored NPs' ability to provide primary care in comparison to that of FPs. Both reviews considered a wide range of patient outcome, process of care, and resource utilization factors, in each case including patterns of referral (i.e., frequency and location of referral). Neither review found any significant difference in referral patterns between provider groups. On the other hand, Offredy and Townsend conducted 36 semistructured interviews with PCPs, patients, and support staff in four general practices in South East England and found clear differences in NPs' patterns of referral. These differences were determined largely by the governing policies of their practice and the level of autonomy—or lack thereof—that the NPs enjoyed (Offredy & Townsend, 2000). In our study, access and reimbursement to the specialist were the same for both groups and thus cannot explain the differences in specialty services requested. It is possible that NP practices have different patient characteristics than FP practices (e.g., a younger or less-complex patient population). This could potentially result in different patterns of referral, as different populations are more likely to require different types of specialty care.

Governmental policies can also impact NPs' referral patterns (Christian et al., 2007; NPAO, 2012; Yee et al., 2013). For instance, the NPAO released a Briefing Note describing how specialists receive lower levels of remuneration when answering consultations from NPs versus FPs. As specialists can claim only medically specific assessment fees from NPs and not consultation fees, many specialists' offices require an FP's signature on any referrals initiated by NPs. This leads to duplication of service, inconvenience for all parties, and delays in care (NPAO, 2012). As a result, the NPs included in the study are used to working in an environment in which specialists receive a financial incentive to favor FP referrals, and therefore may exhibit differences in referral behavior even when using the eConsult service. The NPAO recommends allowing NPs to refer directly to specialists without prohibiting specialists from claiming a consultation fee. The eConsult service has an opportunity to level the playing field, as its payment structure for specialists does not differentiate by referring practitioner.



## Limitations

We were unable to provide descriptive data about the patient populations of PCPs at the time of our study, and consequently cannot confirm whether or to what extent the differences in NP and FP referral patterns can be attributed to other factors (e.g., differences in patient needs). In particular, we cannot differentiate whether the difference in specialties referred to reflects different patient populations treated by NPs and FPs, which previous research suggests could be a factor (Dahrouge et al., 2014). Our study also included a large disparity in the number of FPs and NPs who are enrolled in eConsult and submitted cases. However, this discrepancy is reflected in the provincial numbers of NPs and FPs. Recent literature reports that 14,293 FPs currently practice in Ontario (The Ontario Physician Human Resources Data Centre, 2013) compared to only 1932 NPs (NPAO, 2011). This makes NPs only 14% of the total PCP cohort, whereas NPs consist of 22% of our study population. Lastly, we did not account for clustering of eConsults from the same PCP or practice.

## Implications for practice

NPs' patterns of referral have received minimal examination in the past, despite the fact that in many regions NP referral practices are hampered by restrictive legislation. By examining the patterns and outcomes of referrals made by NPs and FPs, our study provides a unique insight into the use and impact of eConsults between provider types. While we found small differences in the specialties that NPs and FPs refer to and the outcomes of those referrals, ultimately NPs expressed high levels of satisfaction with eConsult, valuing it for their patients and themselves. The service has the potential to reduce inequities in access to specialist referrals that some NPs experience as a result of outdated payment and scope of practice policies.

## Conclusions

NPs and FPs demonstrate different patterns of referral in terms of the types of specialties referred to, the consultation's effect on their course of action, and rates of referral avoidance. While these differences were significant, more research is needed to determine whether they are affected by additional factors such as variations in patient populations between provider groups. Both NPs and FPs rated the eConsult service highly in terms of value for themselves and their patients, although NPs offered slightly higher levels of satisfaction on both counts.

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