

# Improving Access to Rheumatologists: Use and Benefits of an Electronic Consultation Service

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**ABSTRACT. Objective.** To describe the use and benefits of an innovative eConsult service to improve access to rheumatologists.

**Methods.** There were 225 eConsults directed to rheumatology that were categorized by type of question and effect on face-to-face referral rates.

**Results.** The median response time by the rheumatologists was 1.9 days. Clinical questions included drug treatment (34%), diagnosis (26%), or management (14%). Osteoporosis was the most common diagnosis (22%), followed by pain in multiple joints (11%), and polyarthritis (10%). A face-to-face referral was avoided in 38% of cases.

**Conclusion.** There are clinical questions that can be answered quickly by an eConsult, improving access to rheumatologists. (First Release November 1 2017; J Rheumatol 2018;45:137–40; doi:10.3899/jrheum.161529)

## Key Indexing Terms:

RHEUMATOLOGY

REMOTE CONSULTATION

TELEMEDICINE

The rising prevalence of rheumatic diseases and the static number of rheumatologists are major concerns for access to care<sup>1,2,3</sup>. In Canada, wait times for specialist consults for arthritis or rheumatism were longer than for all other conditions, with 31% taking over 3 months, and the wait is a major barrier to providing adequate care<sup>4,5</sup>. Improving access is a priority for professional groups, including the Canadian Rheumatology Association<sup>3,5,6,7</sup>.

Virtual consultations, including technology-enhanced patient-provider visits (telemedicine), and electronic consults (eConsults) may replace a face-to-face visit or enhance the effectiveness of a future visit. Unlike telemedicine, an eConsult does not require the patient to be present and the providers communicate asynchronously, eliminating the need to align schedules. Aside from telemedicine, there are few studies looking at virtual consultation in rheumatology. One

Canadian study compared conventional, e-mail, and videoconferencing consults in 3 rural communities. Primary care providers (PCP) preferred videoconferencing; however, e-mail also received positive responses<sup>8</sup>. A single site American study demonstrated that 25% of eReferrals could be addressed without a clinic visit when the rheumatologist and PCP communicated directly through an electronic system<sup>9</sup>.

The purpose of this paper is to describe the use, benefits, and effect on the need for face-to-face consultations of rheumatology eConsults completed through the Champlain Building Access to Specialists through eConsultation (BASE) service.

## MATERIALS AND METHODS

**Champlain BASE eConsultation Service.** The Champlain BASE eConsult system is an asynchronous, secure Web-based application whereby a PCP may submit patient-specific clinical questions to multiple specialty services<sup>10,11</sup>. The case is assigned to an individual specialist who is expected to respond within 1 week. Laboratory results or photos can be attached, and specialists may request more information, provide a recommendation, or suggest a face-to-face referral. There may be iterative communication between the specialist and PCP. The PCP completes a mandatory closeout survey. One question asks whether the eConsult confirmed their originally chosen course of action, or suggested a new or additional course of action. Another asks the PCP to identify whether they had originally contemplated a referral, and whether they needed to refer the patient after receiving the eConsult response. The specialist self-reports the time required to answer the eConsult and is paid a prorated hourly rate. Since the launch in April 2011, over 1200 PCP have enrolled. There are 102 specialty groups available and over 24,000 eConsults were completed. User satisfaction is high, with PCP commonly citing promptness, quality of replies, and added education from specialist responses as benefits<sup>10,12</sup>.

**Setting and participants.** The Champlain region of Eastern Ontario has a population of 1.2 million<sup>10</sup>. Rural PCP provided 12% of eConsults.

**Data collection.** Data were prospectively collected, stored securely, and then retrospectively accessed for analysis. This included specialist response time,

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time taken to complete the case, and the PCP closeout survey. A log containing the full exchange was saved.

**Ethics.** Ethics approval was received from the Ottawa Hospital Research Ethics Board (2009848-OH1).

**Question categorization.** All eConsults were reviewed and categorized retrospectively by clinical content and type of question by a single reviewer. A predefined list of 31 clinical diagnoses (reached by consensus) and types of clinical questions (based on validated question taxonomy) was created<sup>13</sup>. Diagnoses that represented under 3% of the cases were combined into "other".

## RESULTS

Of the 5597 eConsults completed from April 15, 2011, to January 31, 2015, there were 225 (4%) directed to rheumatology. One rheumatologist answered 71% of cases, while 2 other rheumatologists answered 21% and 8%, respectively. Cases were submitted by 125 different clinicians, 17 (8%) of whom were nurse practitioners. The rheumatologist requested further information before answering in 12 cases (5%). Average response time was 2.8 days (median 1.9 days). Self-reported time to complete the eConsult was under 10 min in 50%, 10–15 min in 39%, 15–20 min in 10%, and over 20 min in < 1% of cases.

The eConsult changed the clinical path for many patients. New recommendations for the course of action occurred in 54% of cases, and in 38%, a referral was avoided (Table 1). There was a diverse set of diagnoses and symptoms, with osteoporosis (22%), pain in multiple joints (11%), and polyarthritis (10%) being the most common (Table 2). Osteoporosis, osteoarthritis (OA), and crystal arthritis eConsults had high rates of referral avoidance, while osteoporosis and abnormal serologic marker without joint symptoms both had high rates of referral that was not originally contemplated and still not needed.

The most common question types were drug treatment (34%), diagnosis (26%), management (14%), or there was

more than 1 question and they were thus unclassifiable (17%, Table 3). Drug treatment questions were most commonly about drug of choice (12%) and "indications or goals of treating a particular condition" (11%).

## DISCUSSION

Our study demonstrated that the eConsult was highly regarded by PCP and can improve access to rheumatology advice in a timely manner, with most eConsults being answered in under 3 days. In addition, 38% of these patients are no longer on our waitlist because a traditional referral was avoided. The benefits of eConsult are especially needed in rheumatology, where long wait times and manpower issues are prevalent.

While not the same as an eConsult, preconsultation exchange uses a similar strategy with information exchange between PCP and specialist, to facilitate triaging of the consultation, to redirect if more appropriate, or to provide suggestions or further investigation. Within rheumatology, 2 groups have looked at preconsultation exchange. In 1 group, a rheumatologist reviewed either faxed or electronic medical records before appointment scheduling and found that 41% of referred patients did not require a rheumatology consultation<sup>14</sup>. A second group identified that 37% of the eReferrals that underwent electronic preexchange were resolved without face-to-face consultation<sup>9</sup>.

Our rate of 38% of eConsults being resolved without traditional face-to-face consultation is remarkably similar to the rates of resolved consultations described by these groups. Independent groups of rheumatologists believe they can safely provide consultation without a face-to-face appointment and the similar referral avoidance rates suggest there is a real potential for eConsult services to shorten waitlists. We are unable to determine whether patient outcomes are com-

Table 1. Outcome of eConsults based on the PCP close-out survey.

Variables	Percent of Consults
Question 1: Which of the following best describes the outcome of this eConsult for your patient?	
I was able to confirm a course of action that I originally had in mind	43
I got good advice for a new or additional course of action	54
I did not find the response very useful	2
None of the above	1
Question 2: As a result of the eConsult, would you say that:	
Referral originally contemplated but now avoided at this stage	38
Referral was originally contemplated and is still needed; this eConsult likely leads to a more effective visit	34
Referral was not originally contemplated and is still not needed; this eConsult provided useful feedback/instruction	21
Referral was not originally contemplated, but eConsult process resulted in a referral being initiated	3
There was no particular benefit to eConsult in this case	2
Other	2

PCP: primary care physician.

Table 2. eConsults categorized by diagnosis or symptom, then subcategorized by referral outcome. Values are n (%).

Diagnosis or Symptom	Total of All eConsults	Referral Contemplated, but Avoided	Referral Contemplated and Still Required	Referral Not Contemplated and Still Avoided	Referral Not Originally Contemplated but Now Initiated
Osteoporosis	49 (22)	20 (41)	6 (12)	21 (43)	1 (2)
Pain, multiple joints	24 (11)	11 (46)	10 (42)	1 (4)	0
Inflammatory polyarthritis	22 (10)	5 (23)	12 (55)	2 (9)	1 (4.5)
OA	15 (7)	10 (67)	1 (7)	4 (27)	0
RA	10 (4.5)	2 (20)	5 (50)	1 (10)	1 (10)
Abnormal serological marker, no joint symptoms	10 (4.5)	3 (30)	1 (10)	5 (50)	0
Crystal arthropathy, gout	9 (4)	5 (56)	2 (22)	2 (22)	0
PMR	8 (3.5)	3 (38)	5 (62)	0	0
Inflammatory monoarthritis	7 (3)	2 (29)	5 (71)	0	0
Fibromyalgia	7 (3)	3 (43)	1 (14)	2 (29)	1 (14)
Other	64 (28)				

OA: osteoarthritis; RA: rheumatoid arthritis; PMR: polymyalgia rheumatica.

Table 3. Classification of clinical questions of submitted eConsults.

Clinical Question	Percent of Consults
<b>Diagnosis</b>	
Interpretation of a laboratory test	9.8
Interpretation of an image report	2.2
Interpretation of a clinical finding	4.4
Other	3.1
What test to choose	6.2
<b>Drug treatment</b>	
Other	1.8
Drug of choice	12.4
Adverse effects of drugs	3.6
How to prescribe a particular drug	3.1
Indications/goals of treating a particular condition	11.1
Interactions between drugs	1.8
<b>Management</b>	
Other providers available	0.4
General management question	5.3
Should I refer	8.4
More than 1 question (unclassifiable)	17.3
No specific question	6.7
<b>Procedure</b>	
Indications	1.3
Other	0.9

parable to those patients referred for a face-to-face visit, and further studies are required to address this.

Our characterization of the clinical questions of the eConsults provides insight into the service use. With higher rates of referral avoidance in osteoporosis, OA, and crystal arthritis, it may be beneficial to highlight the benefits with these diagnoses when implementing an eConsult service. We do not have comparable data on the scope of diagnosis of the traditional faxed consultations, but this is an area of interest and future study.

Osteoporosis and abnormal serological marker without joint symptoms cases have a high rate of referral not origi-

nally contemplated and still avoided, suggesting PCP are seeking further guidance on these diagnoses without contemplating a traditional referral. These may be areas to target for PCP continuing medical education.

There were a few eConsults pertaining to inflammatory arthritis, which were categorized as referral avoided. Because care from a rheumatologist is the standard of care in chronic inflammatory arthritis, we reviewed these eConsults for quality assurance. Three cases pertained to patients with rheumatoid arthritis who were taking immunosuppressants, suggesting a rheumatologist was already involved; however, the PCP question related to medication side effects or interactions (e.g., whether shingles vaccine was contraindicated for a patient taking hydroxychloroquine). Two cases of polyarthritis were generally self-limited diseases (Parvovirus B19 and Lofgren syndrome), while the presence of inflammation was unclear in other cases, with the rheumatologist suggesting an investigation and referral if needed. Two cases of monoarthritis were classified as avoided, with 1 sternoclavicular monoarthritis directed to interventional radiology, and the other a question about distinguishing arthritis from ligamentous injury.

Our study has limitations, however. The geographical limitations of a single health region may make the results not generalizable. As eConsult services continue to expand, it is hoped that others will validate our findings in other jurisdictions. It is too early to assess whether this service will affect wait times. We did not collect patient identifiers and therefore could not track patients to verify whether patients had a face-to-face referral. We were unable to compare patient outcomes, including missed diagnoses, between eConsults and traditional referrals.

Another limitation includes our small dataset. Though to date the eConsult service has processed over 24,000 cases, including 787 rheumatology cases, the majority occurred after the end of the study period and were not included in this

analysis. However, the usage data, including time to respond and referral avoidance, has remained very stable over time. As the eConsult service continues to broaden its geographic scope, increases patient volumes, and starts collecting patient identifiers, we will be able to address some of the above limitations and clearly identify the effect on patient outcomes.

The eConsultation service is a highly effective way to improve PCP access to rheumatology advice. Our service has not only reduced the need for face-to-face referrals but provides an opportunity to increase PCP capacity for managing this growing patient population.

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