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Perspectives in Practice

Characterizing Types of Diabetes Clinical Questions and Answers Provided via eConsults

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Key Messages

- The Champlain eConsult BASE (Building Access to Specialist Advice through eConsult) service provides timely access to endocrinology advice.
- Endocrinologists are usually asked about medication adjustments in diabetes-related eConsults.
- Although often explicit in name and dose of drug, providing rationale for the recommendation may help build capacity in primary care.
- Accessing timely specialist care in Canada is a challenging health-care issue, but eConsult has proven to provide practice-changing advice.
- Face-to-face referrals were avoided in almost half of diabetes eConsult cases.

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Introduction

Accessing timely specialist care in Canada continues to be a challenging universal health-care issue. Delayed access to specialists may have adverse effects on patient care, including patient stress and dissatisfaction, diagnosis and treatment delays, duplication of investigations, and clinical deterioration, resulting in increased health-care costs [1,2]. Innovative efforts to reduce wait times include the development of ehealth platforms, such as electronic consultation (eConsult) and referral (eReferral) [3].

In eastern Ontario, the Champlain eConsult BASE (Building Access to Specialist Advice through eConsult) service has proven to be an effective method of online asynchronous communication between primary care providers (PCPs) and specialists, and has been shown to provide helpful, practice-changing advice [4]. The service enables PCPs to directly ask a specialist a clinical question, avoiding an unnecessary face-to-face referral in 44% of all eConsults and in 67% of cases where the PCP initially contemplated a referral [4].

Endocrinology eConsults comprise 6% to 7% of all eConsults in Ontario [5], and previous research has confirmed that eConsults improve access to endocrinologists in our region [6,7]. Furthermore, PCPs have reported that the Champlain eConsult BASE service provides an opportunity for teaching and can serve as an educational tool in their overall practice and continuing professional development [6], while patients have also expressed

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acceptance for eConsult as a model of care delivery [7]. Most participating specialists agree that they can easily communicate with PCPs and integrate eConsult seamlessly into their workflow [8].

To fully understand the potential of eConsult services to reduce face-to-face visits, further characterization is needed of the types of questions asked and answers provided. About 12% of eConsults to endocrinology between April 2011 and January 2015 were related to diabetes questions [5]. Our objective in this study was to describe the diabetes-related clinical questions and advice provided and to identify specific, recurring clinical content that may help guide PCP professional development.

A recent study analyzing the types of osteoporosis-related questions asked via eConsult showed that PCPs most commonly asked questions about whether treatment should be initiated and what the initial choice of pharmacologic therapy should be [9]. We expected to find that most diabetes eConsults would ask questions about pharmacologic treatment.

Methods

Design

This investigation was a cross-sectional study of diabetes-related eConsults submitted to endocrinologists between January 2018 and December 2020.

Setting

Development and delivery of the Champlain eConsult BASE service has been described elsewhere [10,11]. In summary, it is a secure, web-based platform that allows PCPs (nurse practitioners or family physicians) to ask specialists specific clinical questions in free text using a standardized electronic format; additional information, such as medical history, laboratory results, and imaging reports, can be attached. The system allows asynchronous communication until the PCP is satisfied with the advice provided. PCPs complete a mandatory exit survey with optional free-text comment fields.

The eConsult process is fully described at https://econsultontario.ca/health-professionals.

Data collection and analysis

Three reviewers (G.G., W.B., and S.Z.) categorized 326 endocrinology eConsults (closed between January 2018 to December 2020) as diabetes-related eConsults using Microsoft SharePoint (Microsoft Corp, Redmond, Washington, United States). eConsults were coded to capture the type of clinical question(s) and answer(s), based on preset validated taxonomies established by the reviewers (Table 1). After independently coding the first 20 eConsults, the reviewers compared any discrepancies until consensus was reached to ensure standardization and they agreed on how similar cases should be coded in the future. The remainder of the eConsults were divided between the coders and not reviewed together.

Utilization data were reported including proportion of eConsults submitted by medical doctors vs nurse practitioners, patient age, specialist response time, and cost per eConsult based on specialist time billed.

Descriptive statistics were generated using Microsoft Excel.

Exit surveys

Upon completion of the eConsult, PCPs must complete a mandatory exit survey consisting of 4 questions (multiple choice and Likert scales), including the impact of the eConsult on course of action taken by the PCP, impact of eConsult on need for face-to-face referral, helpfulness and educational value of the eConsult on guiding evaluation or management of the patient, and PCP agreement that their eConsult question addresses an important clinical problem that should be incorporated into upcoming Continuing Medical Education (CME) events.

Table 1
Preset taxonomy for clinical question and answer types

Clinical question type	Answer type
Diagnosis	Diagnosis
Diagnostic criteria	Diagnostic test name
Diagnostic test of choice	Diagnostic criteria
Need for screening	Screening strategies/criteria
Diagnosing type of DM	
Special populations	
Other	
Pharmacologic treatment	Medications
What drug to choose first	Specific name/class
What drug to choose next	Specific name/class with dose
Comorbidities	Specific name/class without dose
Ineffective glycemic control	Dose
Start insulin	Indication/rationale
Adjust insulin	
Adverse effects	Nonpharmacologic treatment
Other	
Nonpharmacologic management	Complications/comorbidities
Treatment targets	Prevention
Addressing comorbidities/ complications	Referral needed
Other	
Unclassified	References cited (yes/no)
No specific question	References embedded (yes/no)
Multiple questions	Referral recommended
	Endocrinologist
	Other
	None
	Anticipatory guidance provided (yes/no)

DM, diabetes mellitus.

Results

Of all endocrinology eConsult cases, 326 of 2,223 (14.7%) were diabetes-related with 128 of 700 (18.3%) in 2018, 126 of 735 (17.1%) in 2019, and 72 of 788 (9.1%) in 2020. Four hundred thirty-eight diabetes questions were coded from 326 diabetes eConsults, as 104 eConsults asked more than 1 question. There were 3 main types of questions: pharmacologic treatment–related (70.1%), non-pharmacologic management–related (13.7%), and diagnosis-related (15.1%). The most commonly asked diabetes clinical question was “what drug to choose next” (52.5%) (Figure 1). In 50% of answers to this question, a specific name or class of drug was provided, but only 31% of them included a dose. The indication or rationale for medication choice was outlined only in 34.4% of cases. “Addressing comorbidities/complications” comprised 4.3% of questions. A face-to-face referral to an endocrinologist was recommended in 16% of all diabetes eConsults. Anticipatory guidance by specialist was provided in 55% of consults where a plan for the next steps was outlined, in case the first set of recommendations was not helpful or effective.

Based on results from the exit survey, 82% of patients did not require a face-to-face referral after completion of the eConsult; however, 57% of eConsults that resulted in a referral asked the most common question of “what to drug to choose next.” Fifty-one percent of questions asking “what drug to choose next” resulted in an avoided face-to-face referral, whereas only 5% of questions

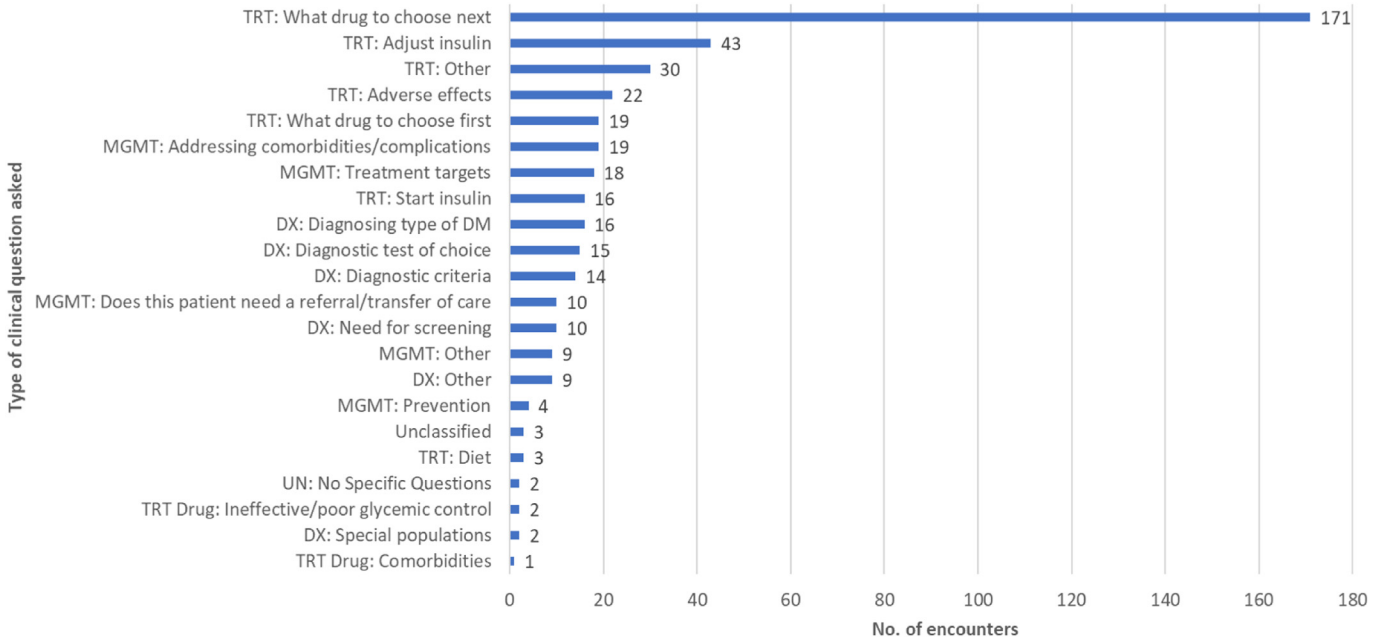

Figure 1. Breakdown of types of diabetes clinical questions asked via eConsult. *DM*, diabetes mellitus; *MGMT*, management; *TRT*, treatment; *UN*, unknown.

asking about "start[ing] insulin" and 11% of "adjust[ing] insulin" questions resulted in an avoided referral.

For exit survey answers, 56% of PCPs reported they received good advice for a new or additional course of action that they will implement, whereas 39% of PCPs confirmed a course of action they originally had in mind. Referral to an endocrinologist was originally contemplated but now avoided in 44% of cases. Fifteen percent of PCPs originally contemplated a referral and still needed one, whereas 36% originally did not contemplate a referral and still did not require one. Seventy percent of PCPs rated the specialist answer as "very valuable" and 74% agreed or strongly agreed their eConsult addresses an important clinical problem that should be incorporated into upcoming CME events.

From 2018 to 2020, 90% of consults were submitted by family doctors, whereas the remainder were from nurse practitioners. The mean patient age was 59.6 years. The median specialist response time was 3.2 (interquartile range 0.89 to 6.41) days and 78% of eConsults were responded to in $\leq$7 days. Specialists billed a mean of 12.38 minutes per eConsult, costing $41.26. Most eConsults (85%) consisted of only a single interaction between PCP and specialist where no additional information was requested from either provider. Finally, 69% of eConsults consisted of 1 clinical question, and 31% asked 2 simultaneous clinical questions.

Discussion

To our knowledge, our study is the first to characterize clinical questions and advice provided for diabetes eConsults in Canada. Endocrinologists are most commonly asked about medication adjustments in diabetes-related clinical questions. Face-to-face referrals were avoided in almost half of the cases, which is in keeping with previous research evaluating the Champlain eConsult BASE service [12,13]. Interestingly, one study that compared common clinical questions asked via faxed referral vs eConsult to our academic endocrinology and metabolism clinic showed that the most common faxed question was about "management of a disease," whereas the most common eConsult question at that time was "diagnosis: interpretation of a laboratory test" [12]. The former finding is consistent with our most commonly asked question of "treatment: what drug to choose next"; this comparison suggests that eConsults are capable of answering question types similar to traditional faxed referrals.

A quality improvement initiative in Dallas County, Texas, showed that most diabetes eConsult questions (90%) asked about "therapy intensification, insulin initiation/titration, or addition of newer diabetes medications" (e.g. glucagon-like peptide-1 receptor agonists or sodium-glucose cotransporter-2 inhibitors) [14]. These findings are similar to ours, where almost 84% of diabetes eConsult questions were related to treatment or management, with the most commonly asked question being "what drug to choose next" (52.5%).

Medication-related questions may be most common due to the increasing complexity of newer antihyperglycemic agents, which has led to a shift in treatment decisions. Instead of basing treatment decisions solely on glycemic effects, clinicians must now also incorporate relevant clinical factors such as presence of cardiovascular disease, heart failure, chronic kidney disease, and age >60 years with multiple cardiovascular risk factors to help determine the next best class of diabetes medication [15]. Addressing medication-related diabetes eConsults may help target clinician-related therapeutic inertia among PCPs and could support appropriate treatment intensification sooner than waiting for a face-to-face endocrinology consult.

Furthermore, our results show that face-to-face referrals were most frequently avoided in questions asking "what drug to choose next" (the most commonly asked question), whereas fewer referrals were avoided in questions about starting and adjusting insulin—this implies that CME events may need to address how to improve confidence and capacity for insulin starts in primary care.

Despite benefits of eConsults including shorter wait time to access specialist advice, avoiding face-to-face referrals, lower costs, improved provider and patient experience, enhanced collaboration between PCPs and specialists, and providing an opportunity for PCP education, eConsults remain relatively uncommon in Canada [16]. Some PCPs have identified increased workload as a limitation due to the follow-up required to implement specialist advice. Although

all PCPs must complete an exit survey (avoiding selection bias), PCPs who use the eConsult service in the first place may have subjective bias regarding its utility and impact. Another limitation is the subjective categorization of question-and-answer types using the preset taxonomy. Although the reviewers discussed any discrepancies and reached consensus after independently coding the first 20 eConsults, the remainder of the eConsults were not reviewed together, so there may be interrater variability among coding. Finally, our results are geographically limited to the province of Ontario, thus evaluation of diabetes eConsults in other provinces may help determine the population generalizability of our data. We also acknowledge that there may be lack of temporal generalizability in the coming years as providers become more familiar with the use of newer diabetes medications.

In conclusion, our findings suggest that the eConsult service may help improve access to specialist advice and reduces unnecessary face-to-face visits, especially when it comes to adjusting diabetes medications and doses. PCPs have a high level of satisfaction with the eConsult service and appreciate the quick turnaround time and quality of specialist advice. Although often explicit in name and dose of drug, providing the indication and rationale for the recommendation by specialists may help build capacity in primary care. Specialists could achieve this by citing and attaching relevant guidelines with their answers. In addition, now that we know the commonly asked diabetes questions via eConsult, we may consider building an answer template to better help endocrinologists reply to these questions or inform participating endocrinologists of the common clinical questions asked so that they may prepare answers and resources ahead of time that can be reused and updated as appropriate. Future directions include incorporating this information into CME programs for PCPs. Continuing professional development could be developed around common medication-related questions asked through eConsults and provision of high-quality eConsult replies. Further training on high-quality eConsult replies should include specific dosing, rationale for recommendations, anticipatory guidance, and embedding of references and citations for newer guidelines.

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Author Contributions

Study conception and design: E.K. and C.L.; Data collection: G.G., S.Z., D.G., and A.A.; Analysis and interpretation of results: G.G., S.Z., D.G., and E. K.; Draft manuscript preparation: G.G. and E.K. All authors reviewed the results and approved the final version of the manuscript.

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