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BRIEF REPORT

A pooled electronic consultation program to improve access to genetics specialists

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ABSTRACT

Purpose: Given limited ambulatory access to genetics specialists, innovative service delivery solutions are needed. Electronic consultation (e-consult) programs are growing to connect clinicians to specialists. We explored the utilization and outcomes of a genetics and genomics e-consult program at Massachusetts General Hospital system in its first year.

Methods: A retrospective observational analysis of genetics e-consults ordered between April 2021 and March 2022.

Results: In its first year, the e-consult service triaged 153 requests and completed 122 in a median of 2.0 days. Of the 97 e-consults with actionable recommendations, there was documentation that most ordering clinicians followed through (82%). A variety of providers used the service, though the majority (77%) were generalists.

Conclusion: e-Consult models should be considered as one way to increase access to genetics expertise.

Introduction

Access to genetic subspecialists for care-related questions is often limited.[1-3] Electronic consultations (e-consults) have been trialed across diverse health systems to provide expedited access to specialty medical providers.[4-6] e-Consult programs within genetics and genomics programs care have emerged as potential models to address access issues by providing first-pass triage of genetics questions, answering simple questions that do not require a visit (thus

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freeing access for additional patient care), as well as educating generalists on genetics care topics that could be directly applied to future patients.

Massachusetts General Hospital (MGH) is an academic medical center in Boston, Massachusetts, where several specialties offer clinical genetics care.[7] From fall 2019 to March 2021, the MGH Preventive Genomics Clinic had started an e-consult program to field referring providers' questions about the use of genetic testing for risk assessments and disease prevention in healthy individuals. However, it was observed that several of the questions being submitted to this e-consult program were better suited to be answered by other specialties. In particular, many questions were most relevant to clinical genetics specialists that asked about symptomatic patients who at times had a known genetic condition, and many other questions focused on cancer genetics.

Therefore, in April 2021, the decision was made to instead launch a "pooled" e-consult program to provide timely outpatient access to subspecialists from 3 different clinics, the MGH Center for Cancer Risk Assessment, MGH Medical Genetics and Metabolism, and the MGH Preventive Genomics Clinic, in hopes of being able to triage and effectively respond to clinician questions through a single electronic health record (EHR) order. In this new model, clinicians order an e-consult through the EHR, select a reason for the e-Consult from a prespecified list and enter a patient-specific clinical question with the option to add additional data or relevant reports. An established institutional e-consult team helped to create an electronic "pool" of specialists willing to respond to these e-consults was identified at the launch of the program. These include 2 physicians from the MGH Center for Cancer Risk Assessment specializing in hereditary susceptibility to gastrointestinal and breast cancer, respectively, a physician from the MGH Preventive Genomics Clinic and a physician from the MGH Medical Genetics and Metabolism clinic. Although in some cases only one step of triage was needed, in some specialties the point person in the "pool" would further triage the question on to specific subspecialists known to them with expertise in distinct subject matter (eg, from triaging physician to an expert in mitochondrial disorders).

Once the e-consult question reaches the answering clinician, this person reviews the patients' EHR data and the data provided in the e-consult question and sends an electronic response to the submitting clinician, which is then documented in the EMR. Although a genetic counselor or another staff member may investigate the submitted topic and draft a response to an e-consult question, if that is the workflow of a particular specialty, per the institution's programmatic requirements, only a physician can complete and sign off on the final e-consult response. Answering clinicians collect an internally funded fee for answering an e-consult. e-Consults can be declined at any point in the process at the triage and answering clinician's discretion.

To better understand the utilization of the e-consult program and outcomes of e-consults, a review of the first year of the pooled e-consult program was performed.

Materials and Methods

The team first conducted a retrospective observational analysis of e-consult data that the Mass General Brigham Institutional Review Board approved.

The analysis characterized providers ordering, the providers responding to, and the patients for whom e-consults were ordered between April 2021 and March 2022, as well as the content of and outcomes of e-consults that were collected over this period. Data were obtained from (1) the Mass General Physicians Organization e-Consult database, which pulls relevant data from the EHR, (2) publicly available MGH websites characterizing providers and their clinics, and (3) chart review. Details of patients (age at order, legal sex, and self-reported race), providers submitting e-consults (degree and specialty), and providers responding to e-consults (specialty) were characterized. e-Consults were characterized by several factors: turnaround time, the prespecified reason for the e-consult, e-consult recommendation type (actionable vs no action recommended), and recommendation follow-through by the submitting provider (Yes vs No/Not Documented).

Patient and provider demographics were summarized descriptively. Next, the team outlined the reasons for e-consult submission and the outcomes of e-consults.

Results

Of 153 e-consults submitted in the program's first year, 122 were completed (80%) and 31 were declined (Figure 1). The reasons for declined e-consults are summarized in Figure 1. A minority of e-consults related to patients over age 65 (8%); patients were primarily female and White (Table 1). Both physicians and nurse practitioners submitted e-consults; a greater proportion of nurse practitioner e-consults were declined (39%) compared with physician-submitted e-consults (18%). Clinicians offering e-consults represented a large range of specialties, though the majority (80/104, 77%) were generalists, such as internists, general pediatricians, and family medicine physicians. Most e-consults were triaged to Medical Genetics and Metabolism (90/122, 73%), followed by Cancer Genetics ($n = 30$, 25%). All clinicians answering e-consults were physicians.

The top prespecified reasons ordering providers selected for e-Consult submission were a personal or family history of cancer ($n = 37$), suspicion or knowledge of a known syndrome or genetic disorder ($n = 35$), and reasons not captured by the other prespecified fields (free text, $n = 25$) (Figure 1). e-Consults were answered in a median of 2.0 days. Most completed e-consults resulted in at least one actionable recommendation for the submitting clinician

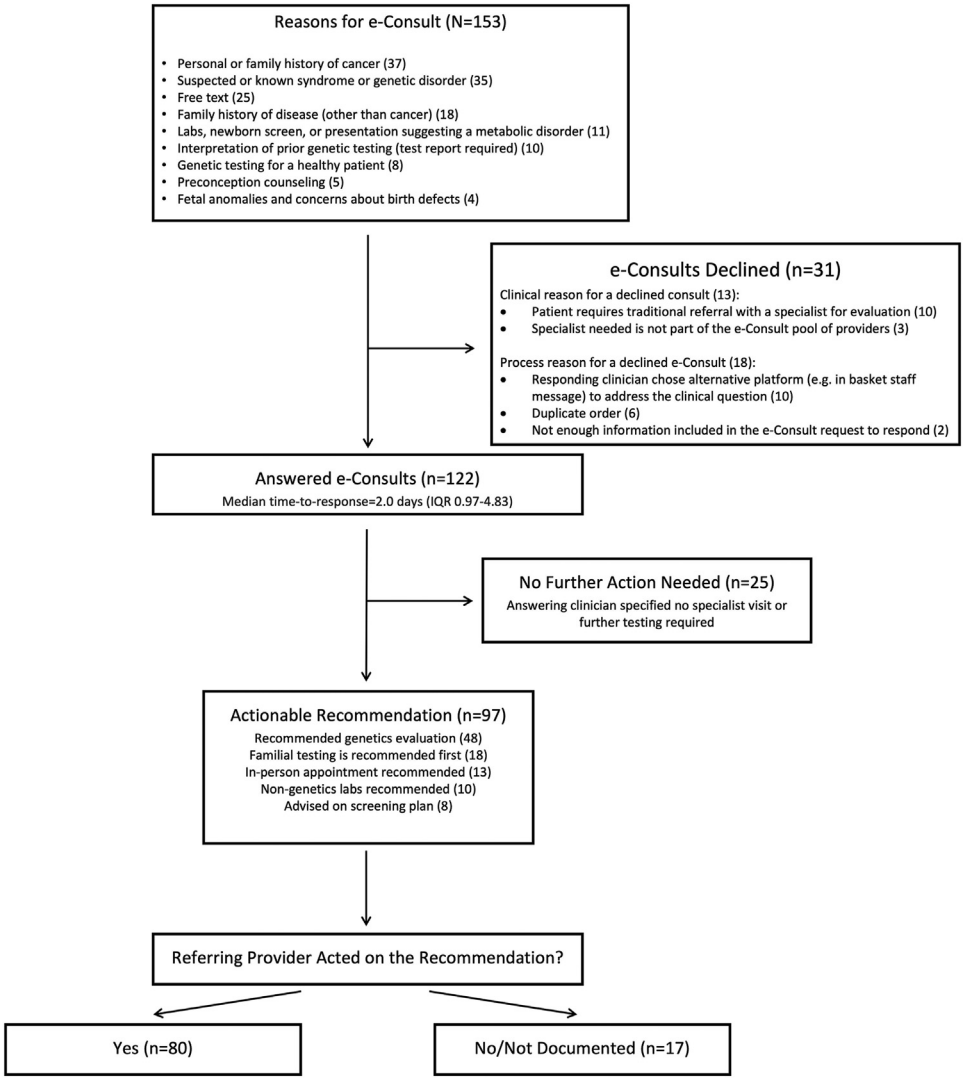

Figure 1 Outcomes of submitted e-consults.

(97/122); 82% (80/97) of those with an actionable recommendation had documented evidence of follow-through.

Discussion

With increasing indications for incorporating genetics into patient care, building systems to improve access to genetics expertise is paramount. In the first year of the e-consult program, diverse questions were submitted by clinicians from various specialties, especially generalist providers. Prior review has shown that 2 key thematic barriers that have limited integration of genetics with primary care include the following: (1) issues of access to genetics specialists and (2) a lack of knowledge and comfort of primary care clinicians with genetics.[8] The data analyzed suggest that e-consult might help to address both of these barriers.

First, the data suggested that an e-consult program could help to reduce unnecessary visits, thereby improving access for patients requiring a visit to a genetics subspecialist. Several potential sources of saved visits were observed in our analyses. For example, of the 122 e-consults answered, 25 recommended no further action, 10 recommended non-genetics lab testing, and 8 advised screening plans. In addition, e-consult recommendations could also improve the efficiency of subsequent genetics evaluations, such as when familial genetic testing was recommended first (18/122 answered e-consults), to enhance the utility of subsequent genetics evaluations. Further studies could assess the impact of e-consults on access to genetics services across the hospital system, including by measuring changes in wait times by referral volume for specialty clinics, which would hypothetically decrease, and improved appropriateness of patients being seen in the specialty clinics, which would hypothetically increase in response to the e-consult program helping to identify patients who are most likely to benefit from a traditional referral and advises of data that must be collected in advance to enhance the visit.

Second, because primary care clinicians have endorsed poor knowledge and comfort providing genetics care to their

Table 1 Characteristics of e-consults ordered ($N = 153$ distinct e-consults)

Characteristic	Total e-Consults ($N = 153$)	% of Total	Accepted ($n = 122$, 80%)	Row %	Declined ($n = 31$, 20%)	Row %
Age at time of referral						
0-17	49	32%	47	96%	2	4%
18 to 34	38	25%	28	74%	10	26%
35 to 64	54	35%	38	70%	16	30%
>=65	12	8%	9	75%	3	25%
Sex[a]						
Male	51	33%	43	84%	8	16%
Female	99	65%	77	78%	22	22%
Race						
Asian	4	3%	4	100%	0	0%
Black	4	3%	3	75%	1	25%
Hispanic	8	5%	7	88%	1	13%
Other	1	1%	1	100%	0	0%
White	121	79%	95	79%	26	21%
Unknown	15	9%	12	80%	3	20%
Referring clinician characteristics ($N = 104$ distinct referring clinicians)						
Referring clinician degree						
MD/DO ($n = 94$)	135	88%	111	82%	24	18%
NP ($n = 10$)	18	12%	11	65%	7	39%
Referring clinician specialty						
Internal medicine ($n = 37$)	55	36%	39	71%	16	29%
Pediatrics ($n = 27$)	36	24%	34	94%	2	6%
Pediatric sub ($n = 11$)	19	12%	18	95%	1	5%
Family medicine or med/peds ($n = 16$)	20	13%	13	65%	7	35%
Adult sub ($n = 10$)	13	8%	10	77%	3	23%
REI ($n = 3$)	10	7%	8	80%	2	20%
Answering clinician specialty ($N = 12$ distinct clinicians, 4 male, 8 female)[b]						
Medical genetics	N/A	N/A	90	73%	N/A	N/A
Cancer genetics	N/A	N/A	30	25%	N/A	N/A
Preventive genomics	N/A	N/A	2	2%	N/A	N/A

e-Consult, electronic consultation; *MD/DO*, doctor of medicine/doctor of osteopathy; NP, nurse practitioner; *Meds/Peds*, combined internal medicine and pediatrics; *REI*, reproductive endocrinology and infertility.

[a]Missing: Legal sex (3).

[b]All clinicians answering e-consults were physicians. e-Consult responses could be prepped for the physician by another team member for review and signature.

patients,[9] the successful use of the e-consult program by generalists is encouraging because such programs can provide a system for interacting and learning from genetics experts. Given that referring clinicians receive a response and rationale for next steps when an e-consult is answered, these responses could provide a form of passive education of the referring clinician about both case-specific and general genetics concepts. Further work could explore if and how generalists referring to the service might integrate what they learn from e-consult responses into the care of future patients and affect both their self-rated and objectively measured genetics knowledge.

Finally, it was observed that a high number of e-consults (20%) were declined. The primary reasons for declining were either clinical (eg, appropriate specialist not in the e-consult "pool" of providers) or process errors (eg, duplicate order entries). Therefore, the next operational steps for the program include resolving clinical barriers to using the program, such as recruiting additional specialists from fields of high demand to join the e-consult "pool," refining workflows, and further educating referring providers on the appropriate use of the e-consult program. By alleviating some of these systems' issues, health systems may see a significant increase in efficiency as unnecessary genetics visits are reduced and patient care is expedited under specialized guidance.

Data Availability

The data used in this study may be made available upon request by contacting the corresponding author. Given that these data were collected for research pursuant to a waiver of informed consent, requests for individual-level data would be for the minimum data necessary (no PHI) and require secure transfer.

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Ethics Declaration

All study procedures were approved by the Mass General Brigham Institutional Review Board (MGB IRB). A waiver of informed consent was granted for individual-level data.

Conflict of Interest

HLR serves as a director of a not-for-profit clinical laboratory that offers genetic and genomic testing. All other authors declare no conflicts of interest.

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