### The Impact of eConsults on Access to Specialty Care for the Uninsured in Rural Texas

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*Abstract:* **Objective**. This study evaluated the impact of eConsults on access to specialty care for uninsured patients in Central Texas. **Methods**. eConsults for four specialties, cardiology, gastroenterology, rheumatology, and endocrinology, were implemented in a large, multi-site federally qualified health center. Data were collected on specialty care access and utilization for a one-year period before and after implementation of the new process. **Results**. Prior to implementation, 23% of uninsured patients referred to the included specialties completed a visit with a specialist. After implementation, 62% received a specialty consultation either through an eConsult or with a face-to-face visit. Wait times for referrals improved from a median of 54 days to seven days. **Conclusion**. This project demonstrated that eConsults improve access and reduce wait times for specialty care for uninsured patients. Interventions such as this have the potential to reduce health inequalities by providing timely access to care for common specialty concerns.

*Key words:* Access to care, medically uninsured, eConsults, underserved populations, health services accessibility, health disparities.

Limited access to specialty care for the uninsured is a large and growing problem, and a significant contributor to health inequality in the U.S.<sup>1</sup> While the national network of federally qualified health centers (FQHCs) and other safety-net clinics helps ensure access to primary care, lack of insurance is a major limiting factor for patients in need of specialty care.<sup>2</sup> Limited access to specialists can result in delayed or deferred care for potentially serious problems, leading to poorer health outcomes and higher downstream costs.<sup>2,3</sup>

One solution to help address limited access to specialty care is the use of eConsults. An eConsult allows primary care providers (PCPs) and specialists to communicate electronically about specific cases. The exchange is typically brief and includes a consult question along with relevant clinical information, images, test results, and other content

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from the medical record. The consult is sent securely to a specialist who can provide diagnostic, treatment, and management advice. In many cases, the guidance provided by the specialist enables the PCP to continue managing the patient's problem, avoiding the need for a face-to-face referral. Patients who still need a face-to-face visit can be triaged and prioritized more effectively after an eConsult review. A growing body of evidence demonstrates that eConsults reduce unnecessary visits and improve overall access to specialty care<sup>4–8</sup> however, to our knowledge no study has investigated their specific impact on patients without insurance.

To expand the use of eConsults, several state Medicaid programs and Medicaid managed care plans now provide funding for eConsults by directly supporting the programs or by providing reimbursement for the eConsult directly to the specialist provider. The Centers for Medicare & Medicaid (CMS) have also recently added eConsult Current Procedural Terminology (CPT) codes 99451 and 99452 to their fee schedule as part of their expanded telehealth coverage. However, for patients without medical insurance eConsults may not available. The Affordable Care Act's expansion of Medicaid significantly reduced the number of people lacking medical insurance in so called *expansion states*, particularly for racial and ethnic minority populations who were more likely to have been uninsured.<sup>9</sup> However, non-expansion states have seen an increase in uninsured rates.<sup>10</sup> Texas, a non-expansion state, leads the country in residents who lack of medical insurance. According the 2018 census, over five million Texans, 17.7% of the population, lacked insurance.<sup>11</sup>

To help improve access to specialty care for uninsured patients we implemented a pilot eConsult program in a FQHC located in Central Texas. Here, we report on its impact for four common medical specialties.

### Methods

**Design**. This study used a retrospective, pre-post cohort design to compare access to specialty care for uninsured patients before and after the implementation of an eConsult program. The study was approved by the Institutional Review Board of the Community Health Center, Inc. and its Weitzman Institute.

**Setting**. The eConsult program was implemented at a large, multi-site FQHC serving four large, predominantly rural counties in Central Texas.

**Timeline**. Implementation of the new program began on July 1, 2018. Training and implementation were completed by August 31, 2018. Data were collected to evaluate the impact of the program from July 1, 2017, one year prior to implementation, through November 30, 2019.

**Study population**. The study included all patients age 18 and older without any form of medical insurance during the study period who received primary care from the FQHC's clinics located in any one of four rural counties, and who were referred to one or more of the specialties chosen for the intervention. Patients with insurance were not eligible to be a part of the eConsult program during the study period, although access was later extended to all patients. The unit of analysis for the study was the referral of the patient to one of the included specialties. Referrals were divided into two cohorts,

those occurring in the year prior to eConsults and those occurring during the one-year period after launch and ramp-up of eConsults (September 1, 2018 through August 31, 2019). Patients who were referred to a specialist in both the pre- and post-intervention period would be included in both cohorts. While patients referred for in-person care would likely be subject to charges for their visits, eConsults were funded through grant support. There were no charges to patients for eConsults.

**Intervention**. All PCPs were trained in the intervention and provided access to eConsults for their uninsured patients. Four specialties were offered based on an internal assessment by the clinic of the specialties with the most severe access limitations. The specialties included cardiology, endocrinology, gastroenterology, and rheumatology. Primary care providers ordered the eConsults in their electronic health record (EHR). A dedicated referral coordinator was trained in the process of uploading relevant documents and submitting eConsults using a secure, HIPAA-compliant transmission pathway. Use of eConsults was strongly encouraged as a first step towards securing a referral. However, clinicians could opt out and send patients directly for a face-to-face referral if they felt it warranted. Specialist eConsult reviewers for the project were all board-certified in their specialty and licensed in the state of Texas. Specialists reviewed and responded to the eConsult via a secure, HIPAA-compliant, web-based platform and were expected to complete their response in no more than two business days.

**Data sources**. Data were collected from the EHR through electronic queries. Additional data were collected from the eConsult platform's database. Data included basic patient demographics, referral specialty, and diagnosis code along with date of faceto-face referrals. Data on ER visits occurring within three months of the requested referral date was obtained from the local health information exchange (HIE) which included data from the two largest hospital systems in the region. Manual chart review was used to supplement electronic data queries to obtain details contained in fax communications regarding face-to-face visits with specialists.

**Outcomes**. For referral requests pre-implementation, determination as to whether a face-to-face visit was completed was made by reviewing the medical record for the presence of a consult note from the specialist. For confirmed visits, the wait time was defined as the number of days between referral request and the date of the completed visit. Post-implementation analysis included the date of the referral request, the date the eConsult was returned, and whether or not the specialist recommended a face-to-face visit. For those patients sent directly for a face-to-face visit without an eConsult, and for those whom the eConsult suggested needed a face-to-face visit, we determined whether a visit was completed, and if so, the wait time. Health information exchange data were queried to determine the number of visits to the emergency room that occurred within a three-month period following the date the specialty referral was first ordered by the PCP.

**Statistical methods**. The referral to a specialist was considered the unit of analysis. Thus, patients with more than one referral would be included more than once in the data. In addition, patients who received a referral in the year prior to implementation and then again after implementation would be included in both cohorts. Statistical analysis was performed using SPSS statistics version 24.0 (IBM, Armonk, NY). Descriptive

statistics were used for quantitative data summaries. Patient demographic information was compared between groups using chi-squared tests for categorical variables. Yates' chi-squared statistics were calculated as an approximation in the analysis of 2x2 contingency tables. An independent sample t-test was used to compare mean wait time between patient groups. Statistical tests were two-tailed and an alpha level of .05 was used. All p-values  $\leq$ .05 were considered statistically significant. To determine if an adequate sample size was obtained, we conducted a post hoc power analysis with power (1- $\beta$ ) set at 0.80 and  $\alpha$ =0.05, two-tailed. This showed that the sample size needed to show significant changes would be N=356 for each group for an increase of 10% in completed referrals. Thus, our sample was sufficient to produce significant results.

### Results

**Specialty referrals**. Over the two-year study period PCPs requested 1,098 referrals and 571 referral requests for 511 unique patients in the year prior to implementation, and 527 consult requests for 491 unique patients post implementation. Patients in the pre- and post-implementation cohorts were similar, with no statistically significant differences in age, sex, race, ethnicity, or language preference (Table 1). Figure 1 shows the outcomes for the referrals overall. Only 128 (22%) of the 571 referral requests in the pre-intervention period were completed. After eConsults were implemented, 157 (30%) of the 527 referral requests had a completed face-to-face visit with a specialist, and an additional 165 (31%) had an eConsult that fully addressed the consult question without the need for a face-to-face visit, meaning that overall, 322 (61%) of the 527 referral requests.

Wait time. Wait time was defined as the time between a PCP's request for a specialty appointment and either the patient completing a face-to-face visit with the specialist or the PCP receiving an eConsult from the specialist that fully addressed the consult question without the need for a face-to-face visit. Patients who were never seen in person and did not have an eConsult were not included in the wait-time analysis. Prior to implementation of eConsults, patients who had a face-to-face visit waited an average of 107 days (median of 51 days) for their appointments. After implementation, wait times decreased to an average of 20 days (median of seven days). This change was in part the result of a substantial number of referrals being fully addressed by an eConsult. However, there also was a decrease in wait times for those patients who were sent for face-to-face visits (Table 2).

**Emergency room utilization**. Before implementation, 511 patients made a total of 167 emergency room visits in the three-month period following their request for a referral in any of the four selected specialties included in the intervention (10.9 per 100 patients per month). In the intervention period, 491 patients had 124 ER visits within three months of referral request (8.4 per 100 patients per month). This difference was not statistically significant.

**Diagnostic codes**. Table 3 shows the most common diagnostic codes for eConsult submissions. Referrals were submitted for a range of conditions and complaints common to primary care, with abnormal electrocardiogram findings, type 2 diabetes,

	Bas N =	Baseline <sup>a</sup> N = 511		Intervention <sup>a</sup> N = 491	
	N/Mean	%/Median	N/Mean	%/Median	
Age (Mean, Median)	47	48	48	49	
Age Group (N, %)	511		491		
18-34	98	19%	89	18%	
35-44	109	21%	108	21%	
45-54	158	31%	124	24%	
55-64	117	23%	138	27%	
65–79	25	5%	28	5%	
80+	4	1%	4	1%	
Sex (N, %)	511		491		
Male	181	35%	174	34%	
Female	330	65%	317	62%	
Race (N, %)	511		491		
American Indian or Alaska Native	4	1%	3	1%	
Asian	22	4%	21	4%	
Black or African American	49	10%	52	10%	
More Than One Race	3	1%	1	0%	
White	337	66%	306	60%	
Other	96	19%	108	21%	
Language (N, %)	511		491		
English	345	68%	355	69%	
Spanish	150	29%	123	24%	
Other	16	3%	13	3%	

# Table 1.PATIENT DEMOGRAPHICS<sup>a</sup>

Note:

anone of the differences between baseline and intervention patients were statistically significant.

abdominal pain, and abnormal laboratory findings the most common for cardiology, endocrinology, gastroenterology, and rheumatology, respectively.

### Discussion

These findings highlight the dramatic limitation in access to specialty care for uninsured patients in Texas. Of the more than 500 requests for specialty consultations in four common specialties prior to the intervention, 78% did not complete a visit. However, the use of an eConsult process significantly reduced uncompleted referrals to 39%. eConsults allowed PCPs to obtain needed input from specialists rapidly and to implement their recommendations in primary care, reducing the number of patients needing to be seen



Figure 1. Referral outcomes.

## Table 2.

### WAIT TIMES<sup>a</sup>

	Baseline <sup>a</sup>		Intervention <sup>a</sup>	
Wait Time (days)	mean	median	mean	median
Cardiology	128	56	28	8
Endocrinology	111	42	15	4
Gastroenterology	98	55	18	7
Rheumatology	84	60	19	5
Total	107	54	20	7

Note:

<sup>a</sup>all differences between baseline and intervention were statistically significant by independent T-test (p<.05).

in person. This study adds to the growing body of evidence demonstrating the positive impact of simple, asynchronous, electronic communication between primary care and specialty care providers to improve access, reduce wait times,<sup>4,7</sup> and reduce cost.<sup>12-15</sup>

This study did not explore patients' perceptions regarding their clinician's use of eConsults. Other studies have demonstrated positive patient views of eConsults.<sup>16,17</sup>

### Table 3.

## TOP DIAGNOSES FOR ECONSULTS FOR FOUR SELECTED SPECIALTIES (N=130)

### N Cardiology

- 9 abnormal electrocardiogram
- 4 palpitations
- 7 chest pain
- 3 cardiac murmur, unspecified
- 3 atrial fibrillation
- 2 atherosclerotic heart disease of native coronary artery without angina pectoris
- 2 tachycardia, unspecified

### N Endocrinology

- 8 type 2 diabetes
- 4 hypothyroidism
- 4 thyrotoxicosis
- 3 type 1 diabetes
- 2 abnormal lab results
- 2 adrenocortical insufficiency
- 2 nontoxic single thyroid nodule

### N Gastroenterology

- 18 abdominal pain
- 12 gastro-esophageal reflux disease
- 4 constipation
- 4 alcoholic cirrhosis of liver with ascites
- 3 diverticulitis of intestine
- 3 personal history of other diseases of the digestive system
- 2 abdominal distension (gaseous)

### N Rheumatology

- 11 other specified abnormal immunological findings in serum
- 7 rheumatoid arthritis
- 5 pain in joint
- 2 systemic lupus erythematosus
- 2 fibromyalgia
- 2 unspecified osteoarthritis

Patients in this study were uninsured and likely to be even more favorably disposed towards the intervention given its potential to avoid unnecessary out of pocket expenses. The high cost of health care for uninsured patients often results in delayed or deferred care with negative clinical consequences in the future. Analyses of the most common codes associated with eConsults suggests that PCPs used eConsults to obtain guidance in a range of potentially serious medical conditions such as atrial fibrillation, alcoholic liver disease, and type 2 diabetes that could, in absence of specialty guidance, lead to serious consequences. Further research is needed to evaluate the impact of eConsults on outcomes for specific clinical conditions.

We hypothesized that long wait times or inability to be seen by a specialist would result in higher emergency room use that would, in part, be mitigated by the use of eConsults. Emergency rooms are commonly utilized by uninsured patients to obtain care that they are unable to receive elsewhere.<sup>12</sup> Nearly 80% of patients referred prior to the intervention did not see a specialist, and those who did had an average wait time of more than three months. Patients had relatively high rates of emergency room use, and we were not able to detect a statistically significant difference following eConsult implementation. This may be due to the limited sample size. It also may suggest that eConsults are particularly used for less serious conditions or problems that might not result in an emergency room visit. Diagnostic codes show that eConsults were used for a range of acute and chronic issues from chest pain, palpitations, and abdominal pain to abnormal lab results, fibromyalgia, and thyroid disorders. However, it is not possible to determine the acuity or severity of the conditions from these codes. Further research is needed to explore this issue further.

This study had several strengths. The robust data capabilities of the FQHC combined with detailed chart review ensured that accurate data were obtained for all referral requests. In addition, the use of a single, dedicated referral coordinator to manage all aspects of eConsult submission and the requirement to use eConsults prior to any face-to-face referral helped to ensure that the program was implemented uniformly across multiple sites.

Limitations include the pre-post study design which limits the ability to draw firm conclusions regarding causality. However, it is reasonable to attribute much if not all the improvements in access to the intervention given the magnitude of the observed change and the fact that there were no major changes in access to insurance or other significant trends likely to have affected access to care to this extent. In fact, lack of medical insurance increased in Texas over the course of this study. While the use of a single FQHC in the study also limits its generalizability, the intervention addressed a problem common to nearly all FQHCs and did not require substantial additional resources or technological capabilities. Transmission relied on simple electronic communication tools available in nearly all major electronic health records, including those used by most FQHCs.

The intervention also did not require substantial additional staff resources to implement or manage. While a dedicated staff member was hired and assigned to manage eConsults, it is likely that their work overseeing the new process reduced workload for others in the health center. Obtaining and tracking face-to-face referrals is a demanding and time-consuming process that often requires significant commitment of time and effort. In addition, long wait times or inability to obtain needed specialty care likely adds burdens to the PCP and their staff who must continue to manage the condition or problem while waiting for input from the specialist. Reducing the overall number of face-to-face specialty visits requested may actually have saved time and reduced overall staff burden.

Other studies have revealed that PCPs have mixed views on whether eConsults create more or less work for them. Some express concern that submitting eConsults and acting on the advice contained in the response leads to more work while others note that getting answers to questions rapidly is more convenient and improves the overall efficiency of the referral process.<sup>18, 19</sup> While we did not assess PCP satisfaction in this study, it is likely, given the extreme difficulty obtaining specialty care for the uninsured in these rural locations, that providers obtained benefits from the intervention that outweighed any concerns about added time burden.

Limitations in access to care due to lack of insurance is among the most unjust aspects of the U.S. health care system and contributes to inequity in health outcomes that disproportionately affect poor, rural dwelling, and ethnic/racial minority populations. This project demonstrates that a low-cost technology that connects PCPs and specialists electronically can improve access and strengthen the scope of primary care. There are over 1,300 FQHCs located in medically underserved communities across the country. Solutions such as this are needed to strengthen their scope and enhance their capabilities, particularly in regions where lack of insurance is common.

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