

U.S. Air Force Telehealth Initiative to Assist Primary Care Providers in the Management of Diabetes

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More than 50,000 active-duty U.S. Air Force (USAF) service members, retirees, and family members with diabetes receive care at more than 50 military treatment facilities (MTFs) throughout the continental United States.¹ Although many of these patients are referred to civilian network diabetes specialists because of a scarcity of military endocrinologists, most are managed by USAF primary care providers (PCPs). In an effort to assist PCPs in managing complex diabetes cases, a team from the USAF Diabetes Center of Excellence (DCOE) in San Antonio, Tex., adopted the Extension for Community Healthcare Outcomes (ECHO) model of care.

Research Design and Methods

The ECHO model of health care delivery was developed and implemented originally by Dr. Sanjeev Aurora and his team at the University of New Mexico² to treat underserved patient populations with hepatitis C. The model uses technology, specifically video teleconferencing, to provide support to PCPs in remote areas who may lack the experience, knowledge, or confidence needed to manage this complex condition. Results demonstrated that patients treated remotely through ECHO experienced similar clinical improvement with fewer adverse events than those treated at the university specialty clinic. The University of New Mexico has adapted the ECHO

model for ~20 other chronic illnesses, including diabetes.

After training with the New Mexico team, DCOE endocrinologists and support personnel adapted the ECHO model to address the unique needs of military PCPs and their patients with diabetes. The USAF ECHO initiative was designed such that sessions, open to all military medical staff (including, but not limited to, specialty care providers, midlevel providers, nursing staff, pharmacists, and nutritional medicine professionals), were transmitted via video and telephone conferencing systems twice monthly. The consulting team from the DCOE consisted of endocrinologists, endocrinology fellows, certified diabetes educators (registered dietitians and registered nurses), and behavioral specialists.

An electronic case referral form, including information about medical and psychosocial history, laboratory data, and current treatment plan, was designed and distributed to all participants to standardize case submissions. At each session, cases were presented by the submitting provider and discussed among participants, including the submitting provider, DCOE team members, and other medical professionals in conference who wished to contribute.

Each session also included a didactic presentation on a relevant diabetes-related topic provided by a subject matter expert. Topic suggestions were solicited from prospective participants. Continuing medical

education credit was offered as an incentive to all participants who attended sessions.

The initial aim of the project was to better equip PCPs with the tools (knowledge, support, and confidence) to better manage their complex diabetes patients. The DCOE team elected to track provider outcomes rather than clinical outcomes (such as measures of glycemic control) because multiple factors influence clinical outcomes, many of which cannot be isolated from the impact of the ECHO intervention. In addition, the concurrent launch of several other USAF diabetes initiatives further compounded the problem of being able to establish the specific effect of ECHO on clinical outcomes.

After each session, participants were asked to complete a feedback questionnaire, through which respondents rated their agreement to statements regarding their pre- and post-session knowledge and confidence levels, as well as their intention to change their practice. The questionnaire used a Likert scale in which 0 indicated strong disagreement with a statement and 5 indicated strong agreement with a statement. To isolate the effects of the intervention on the target population of PCPs from total participants, DCOE planners included a section in which respondents selected their appropriate medical background. A paired *t*-test was used to determine the significance of

Table 1. Participant Feedback*

Questionnaire Items (Participants were asked to rate their degree of agreement with each statement.)	All Participants	PCPs Only
Perceived knowledge		
<i>"I had sufficient knowledge of the discussion topic before the ECHO presentation/session."</i>	3.62	3.6
<i>"I have sufficient knowledge of the discussion topic after the ECHO presentation/session."</i>	4.5	4.42
Significance value from paired t-test (P)	< 0.001	< 0.001
Confidence		
<i>"I felt confident with regard to the treatment of complex diabetes patients before this ECHO session."</i>	3.52	3.61
<i>"I feel confident with regards to the treatment of complex diabetes patients after this ECHO session."</i>	4.24	4.39
Significance value from paired t-test (P)	< 0.001	< 0.001
Intention to change current practice		
<i>"I am likely to make changes to my treatment practice for patients with diabetes based on what I learned in the ECHO session today."</i>	4.08	4.29
Respondents who rated intent to change practice at 3 (slightly agree) or higher (%)	94.9	96.8
Respondents who rated intent to change practice at 5 (strongly agree) (%)	41.8	45.2
Total responses from 20 sessions (n)	98	31
Average response rate (%)	23.4	27.9
*Average feedback for all sessions in 2012. Likert scale key: 0, strongly disagree; 1, moderately disagree; 2, slightly disagree; 3, slightly agree; 4, moderately agree; and 5, strongly agree.		

differences between pre- and post-session scores.

Results

The first session was held on 13 January 2012; 20 ECHO sessions were conducted throughout that year. Over the course of the year, 145 participants registered for ECHO from 20 separate MTFs; however, 28 participants (19%) did not attend any sessions, primarily because of schedule constraints. Participants included 50 PCPs (12 of these identified themselves as mid-level providers), as well as primary care residents, endocrinologists, registered nurses, dietitians, pharmacists, and others. The average attendance was 25 participants per session. Participants submitted 17 cases for discussion in 2012; these were supplemented with 20 DCOE clinic cases for

a total of 37 cases addressed over the course of the year.

Outcome data (Table 1) showed the overall response rate was 23.4% for all participants and 27.9% for PCPs. The average self-score for perceived level of knowledge before sessions was 3.62 for all respondents and 3.60 for PCPs. The average self-score for perceived level of knowledge after sessions was 4.50 for all respondents and 4.42 for PCPs. For both groups, this increase in perceived diabetes knowledge was statistically significant ($P < 0.001$ and $P < 0.001$, respectively). The average self-score for personal confidence level with regard to treating complex diabetes patients before sessions was 3.52 for all respondents and 3.61 for PCPs. The average self-score for personal confidence level with regard

to treating complex diabetes patients after sessions was 4.24 for all respondents and 4.39 for PCPs. For both groups, this increase in personal confidence level was statistically significant ($P < 0.001$ and $P < 0.001$, respectively).

Nearly all (94.9%) respondents indicated that they were at least somewhat likely to alter their current diabetes management practices based on what they had learned at the session. A similar proportion of PCPs (96.8%) agreed with the statement, "I am likely to make changes to my treatment practice for patients with diabetes based on what I learned in the ECHO session today" at a level of 3 ("somewhat agree") or higher. Nearly half of the PCPs (45.2%) agreed with this

statement at the maximum level of 5 (“strongly agree”).

Discussion and Conclusions

The ECHO Initiative, like other current USAF Medical Services initiatives, fits the patient-centered medical home model of care by supporting the PCP team’s ability to provide comprehensive, high-quality care. Data collected from participant feedback indicated that the ECHO intervention resulted in a significant positive change in perceived diabetes knowledge and personal confidence levels, as well as intention to modify practice, among PCPs and other medical personnel in the Military Health Services. Surprisingly, a substantial number of participants were from outside the original target population (PCPs), and, like the PCPs, these participants found ECHO sessions to be educational, confidence build-

ing, and likely to result in a change in personal practice.

The implications of these results include the potential to successfully manage complex diabetes patients at the primary care level and reduce referrals to the private sector. Treating more patients at the primary care level will lead to improved continuity of care, improved patient access, and significant cost savings. In the future, the DCOE plans to examine the effects of ECHO on clinical outcome trends and referral rates. The USAF is also expanding the ECHO initiative to include other specialty care areas.

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