

# Is Telehealth Right for Your Practice and Your Patients With Asthma?

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## Abstract

**Introduction:** Telehealth services are becoming increasingly used to provide care to patients living in rural areas. Little is known about the patient satisfaction with the provision of these services. **Methods:** A prospective cohort pilot study was developed to evaluate the use of telehealth for the delivery of asthma education services in the rural, medically underserved community of Oakes, North Dakota. A certified asthma educator used real-time, audio-visual telehealth technology to meet with patients the local community pharmacy. Patients met with the educator monthly for the first three months of the study, and once every three months thereafter. Patient satisfaction was measured using a five item survey. **Results:** Eighteen patients completed the study (90 percent completion rate). Patient satisfaction scores were relatively high, typically between 4 and 5 on a 5-point scale. **Conclusions:** Participants in a rural, medically underserved community found the community pharmacy location and the telehealth technology a convenient means to access a specialty provider for asthma education.

## Keywords

patient satisfaction, community pharmacy, telehealth, rural health

## Introduction

According to the Health Resources and Services Administration, telehealth is “the use of technology to deliver health care, health information, or health education at a distance” (1). There are currently 2 forms of telehealth delivery—real-time communication and store-and-forward (1). Real-time communication uses a secure live audio/video link, which is used by patients to interact with a health-care provider.

According to a 2011 report from the National Conference of State Legislators, approximately one-fifth of the population lives in rural America, but only 10% of physicians practice in these areas (2). Because of this disparity, rural Americans typically have to travel great distances to reach health providers. A recent survey of family physicians found that both users and nonusers of telehealth technologies believe that these technologies will improve access to primary care services (3, p4).

As these services are becoming increasingly accessible, a major stakeholder perspective, the patient’s, is needed on this type of health-care delivery. Adapting the provision of clinical services based on their perspectives can lead to more efficient, higher quality care. To evaluate the use of telehealth for delivery of asthma education to rural medically underserved patients, a study in Oakes, North Dakota, was initiated.

## Methods

### Target Population

Oakes, North Dakota (population 1856 and located in rural Dickey County), was chosen due to its higher prevalence of patients reporting current asthma (8.9%) compared to the state average (7.1%; 4). The closest allergy and pulmonary clinics are 72 miles away and across the state border in Aberdeen, South Dakota. The travel costs to see a specialist and lost wages from having to take time off from work create undue financial hardships and, by extension, health disparities in the county. Oakes is a pivotal location for primary care and acute care access and is the socioeconomic center of the county (ie, it has a school, a grocery store, and a critical access hospital). A videoconferencing system was established in a community pharmacy in Oakes, which provided

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1.	The use of telemedicine technology is worth my time.
<input type="checkbox"/>	Always
<input type="checkbox"/>	Often
<input type="checkbox"/>	Sometimes
<input type="checkbox"/>	Seldom
<input type="checkbox"/>	Never
2.	I look forward to my visits by telemedicine technology.
<input type="checkbox"/>	Always
<input type="checkbox"/>	Often
<input type="checkbox"/>	Sometimes
<input type="checkbox"/>	Seldom
<input type="checkbox"/>	Never
3.	The use of telemedicine technology is a convenient way to receive care.
<input type="checkbox"/>	Always
<input type="checkbox"/>	Often
<input type="checkbox"/>	Sometimes
<input type="checkbox"/>	Seldom
<input type="checkbox"/>	Never
4.	I am satisfied with the care I received though the use of telemedicine technology.
<input type="checkbox"/>	Always
<input type="checkbox"/>	Often
<input type="checkbox"/>	Sometimes
<input type="checkbox"/>	Seldom
<input type="checkbox"/>	Never
5.	I prefer the use of telemedicine technology over a face to face visits.
<input type="checkbox"/>	Always
<input type="checkbox"/>	Often
<input type="checkbox"/>	Sometimes
<input type="checkbox"/>	Seldom
<input type="checkbox"/>	Never
Additional Comments:	
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**Figure 1.** Telemedicine experience survey.

patients with easily accessible, secure, Health Insurance Portability and Accountability Act (HIPAA)-compliant telehealth technology.

### Intervention

A prospective cohort pilot study to evaluate the use of telehealth for delivery of asthma education to rural, medically underserved patients in Oakes was initiated. Over 1 year, the remote asthma educator (located in Fargo, North Dakota) met with patients in Oakes, North Dakota, via live audio/video link monthly for the first 3 months to address key educational messages based on the National Asthma Education and Prevention Program guidelines and every 3 months thereafter for maintenance. To assess the impact of the use of telehealth technology as a delivery model for the asthma

education intervention, a brief survey was developed to assess patient satisfaction with the use of this technology. The survey contained 5 items related to satisfaction (one of which focuses on overall satisfaction with the services provided) and space for open-ended comments (Figure 1).

This pilot study was approved by the institutional review board (PH12067) of North Dakota State University. All participants signed a written informed consent.

## Findings

### Patient Satisfaction

Thirty-eight individuals were screened for study inclusion. Twenty qualified for the study by demonstrating reversible lung disease via spirometry. Eighteen patients completed the year-long study, leading to a study completion rate of 90%. Most patients rated their overall satisfaction with the telemedicine services relatively high—between 4 and 5 on a 5-point scale ( $P < .05$ ; Table 1).

### Genetics and Expanded Access

Studies on identical twins have shown that genetic determinants play a role in inherited predisposition for the development of asthma (5). While recruiting for this study, we observed this phenomenon. This phenomenon led to 1 mother recruiting her adult daughter to be included in the study. Her daughter worked 2 different jobs, which normally would not allow her to participate; however, due to the flexible scheduling available via telehealth, she was able to complete the year-long study.

The parents of children who participated in the study liked the flexibility to schedule the visits before or right after the school day. In 1 family, the elementary age son qualified for the study. The family also had a 4-year-old, who was too young for study inclusion, with similar symptoms. This particular family always brought both children to the pharmacy to learn about asthma. In another family, the father qualified for the study. Although he did not have his child screened for the study, during the first 2 education sessions he brought one of his children, who he suspected might have asthma, to listen to the education. During the posteducation follow-up visit period, he was able to schedule the visits around his lunch hour, thus not having to take time from work to complete the study.

### Challenges and Successes

Qualitative, open-ended comments in the satisfaction survey identified several interesting challenges and opportunities. Many of these challenges and opportunities were simultaneously observed by the pharmacy staff and the asthma educator. For example, although all patients eventually became comfortable using the telehealth technology, older patients (especially those 65 years and older) took more time to adjust to its use. These patients initially took more time to

**Table 1.** Mean Patient Satisfaction of Asthma Education Telemedicine Visits Over 1 Year.

	Number of Patients	Mean Level of Patient Satisfaction (1 = Never, 5 = Always)	2-Sided P	1-Sided P	Lower 95% Confidence Bound	Upper 95% Confidence Bound
Visit 1	6	4.50	.10	.05	3.92	5
Visit 2	14	4.93	<.01	<.01	4.78	5
Visit 3	14	4.85	<.01	<.01	4.63	5
Visit 4	16	4.94	<.01	<.01	4.81	5
Visit 5	17	4.94	<.01	<.01	4.82	5
Visit 6	17	4.94	<.01	<.01	4.82	5

interact with the asthma educator since they were more accustomed to passively watching a computer monitor rather than using the technology to speak with the asthma educator. Older adults found the telemedicine encounters to be more convenient, but given the option, they expressed preference for traditional face-to-face interactions.

Research has shown that empowering patient's self-efficacy has a direct impact on health behavior change (6). With asthma, a tool that is used with patient input to facilitate self-efficacy is a written asthma action plan. One of our study patients carried a copy of her asthma action plan in her purse. While she attended training for her work 113 miles away from her home town, she came in contact with an unknown trigger and started to have symptoms. In the past, she would have ignored early symptoms, waited until she needed medical attention, and gone to the closest emergency department. On this occurrence, she recognized the early warning symptoms and reviewed the details of her asthma action plan. She took her quick relief medication and removed herself from the area where she started to experience symptoms. These actions minimized the asthma exacerbation and, instead of potentially needing to go to the emergency department, she was able to travel back to her home town that evening without the need for additional medication. She was so proud of herself that she contacted the research team the next day to describe her successful self-management.

## Discussion

For health professionals considering a telehealth service, the first step is determining the need and scope of the telehealth service. In this pilot, we identified an area with higher current asthma prevalence and difficult access to specialty services.

When identifying a location for telehealth service, pinpointing an area where multiple services are available (eg, gas station, grocery store, school) allows patients to incorporate other daily tasks along with the telehealth visit. In this pilot study, using a community pharmacy was a strategic choice of location for providing care for rural residents. Patients typically are already accessing services (eg, personal care products, over-the-counter medications) that do not require a prescription as well

as picking up prescription medications. Participants perceived that it was easier to access the educational services through the pharmacy compared to other health-care facilities, even with a scheduled visit. One limitation of this study was not collecting the education level of the patients, as this could influence perceptions.

The next task is identifying the availability of technology to facilitate the service. We were able to utilize an existing telepharmacy network for delivery of this telehealth study. With current advances in secure, HIPAA-compliant, web-based systems with billing capabilities, it is now possible for more health professionals to consider expansion of their practice to include this type of care for patients with asthma and other disease states.

A number of considerations would be important when designing a similar system, including initial needs assessment, platform selection, policy development, and program evaluation. One well-written resource that can get you started down the telehealth path is Tuerk and Shore book "*Clinical Videoconferencing in Telehealth Program Development and Practice*" (7). Examples given are from a mental health perspective but are applicable to other conditions.

Health providers need to consider how they will interact with the patient through this type of medium. Positioning of the webcam so that the patient can be seen from the waist up was very helpful to pick up on nonverbal cues. Camera position was particularly important when patients demonstrated their inhaler technique. Allowing the patient to see the provider from the waist up versus from the neck up allowed for nonverbal cue transfer from the health provider as well. This was particularly helpful to increase older patients' comfort to engage with the asthma educator through the videoconferencing medium. Additional advantages afforded by our videoconferencing system were a document camera and picture-in-picture function. This system allowed the asthma educator to review documents provided by patients, such as an asthma symptom diary, while being able to watch patient body language.

Especially with the education component, it was important to make the videoconferencing experience visually appealing. For example, graphics were used to enhance instruction about environmental factors that trigger asthma symptoms. Instead of only talking to the patient about

triggers, the asthma educator showed microscopic pictures of common triggers (eg, Ragweed pollen) and had the patient “guess” what the graphics represented. This facilitated greater discussion and perceived retention of information about common triggers.

## Conclusion

Delivering asthma education via telemedicine technology was well received, but it may take older patients more time to adapt to the technology. Participants in a rural, medically underserved area found the community pharmacy location and telehealth technology a convenient way to access a specialty provider for asthma education.

## Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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## References

1. What is Telehealth [Internet]? Rockville, MD: Health Resources and Services Administration; 2016. <http://www.hrsa.gov/healthit/toolbox/RuralHealthITtoolbox/Telehealth/whatistelehealth.html>. Updated January 27, 2016. Accessed December 20, 2016.
2. Telehealth and Rural Health Care Delivery [Internet]. Washington, DC: National Conference of State Legislatures; 2001. <http://www.ncsl.org/Portals/1/documents/health/RHTelehealth.pdf>. Accessed December 20, 2016.
3. Klink K, Coffman M, Moore M, Jetty A, Petterson S, Bazemore A. Family Physicians and Telehealth: Findings for a National Survey [Internet]. Washington, DC: Robert Graham Center; 2015. <http://www.graham-center.org/content/dam/rgc/documents/publications-reports/reports/RGC%202015%20Telehealth%20Report.pdf>. Accessed December 20, 2016.
4. County level estimates for health risk factors 2000-2006 [Internet]. Bismarck, ND: North Dakota Department of Health; 2008. <http://www.ndhealth.gov/brfss/?id=61>. Accessed December 20, 2016.
5. Patino C, Martines F. Interactions between genes and environment in the development of asthma. *Allergy*. 2001;56:279-86.
6. Brady TJ, Murphy L, O'Colmain BJ, et al. A meta-analysis of health status, health behaviors, and health care utilization outcomes of the chronic disease self-management program. *Prev Chronic Dis* [Internet]. 2013;10:1-14. [http://www.cdc.gov/pcd/issues/2013/12\\_0112.htm](http://www.cdc.gov/pcd/issues/2013/12_0112.htm). Accessed December 20, 2016.
7. Tuerk P, Shore P. *Clinical Videoconferencing in Telehealth Program Development and Practice*. Cham, Switzerland: Springer International Publishing; 2015.

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