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Connect, Engage: Televisits for Children With Asthma During COVID-19 and After

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A B S T R A C T

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Despite the many barriers to receiving care, children with asthma must have access to regular care and frequent follow-up visits. The usual barriers to the provision of asthma care have been made even more complicated by the current coronavirus disease 2019 pandemic. To minimize the disruption of care due to the necessary constraints dictated by coronavirus disease 2019, the televisit provides a practical solution that can assess the child's current level of symptom control, reinforce asthma education, and determine treatment options. This article provides the tools and guidelines to facilitate the implementation of successful televisits to provide uninterrupted care for children with asthma.

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Asthma is a recalcitrant chronic disease that requires management through constant reinforcement and comprehensive teaching, including education on the mechanism of bronchospasm and the need for medications and devices. Pediatric asthma continues to be its own global epidemic, with morbidity and mortality having consistently risen over the last 40 years.¹ Children with asthma are at an even higher risk than adults with asthma because they have more documented routine office visits, emergency department visits, and urgent care visits for asthma.² As a critical component of quality preventative care, it cannot be emphasized enough that the child with asthma needs regular access to appointments for care and assessment. However, multiple barriers have been identified by families that preempt scheduling or attending the needed appointments required for good symptom control. These include taking time off from work, disrupting the child's school day, inconvenient appointment times and/or inaccessible location(s), transportation issues, managing "usual" daily stress while concomitantly managing the child's asthma treatments and appointments, and the child seems "recovered" so there is no perceived need for a follow-up visit.³ More recent considerations are high rates of unemployment, being uninsured, and being undocumented.⁴ These missed appointments have been shown to directly correspond to more frequent emergency room visits.⁵

Despite the health care provider's efforts to maintain consistent intervention, families still have difficulty understanding the causes of asthma, when and how to use asthma medications, and symptom prevention.⁶ This could lead the families to underestimate the severity of the child's asthma and therefore undertreat the asthma symptoms. Contributing to this mismanagement is the influence of nonprofessional or nonmedical sources, including from the

Internet, on the parents' approach to and decision making for medication administration and overall asthma management.⁷ Children with the resultant uncontrolled asthma and 1 or more exacerbations were more likely to experience limitations in activity, missed school days, emergency department visits, and hospitalizations.⁸ A very significant long-term outcome to poorly controlled asthma is the loss of lung function.⁹ In general, compared with healthy children of the same age, children with asthma, especially poorly controlled asthma, were noted to have a lower quality of life in physical performance, emotional performance, and school performance.¹⁰

Clinical Practice Guidelines

To address the need for greater child/family understanding and increased compliance, the National Heart, Lung, and Blood Institute Expert Panel Report 3 (NHLBI-EPR 3) guidelines on asthma published in coordination with the National Asthma Education and Prevention Program (NAEPP) Coordinating Committee provide a comprehensive stepwise approach aimed at improving the quality of care for asthma.¹¹ To summarize, the report has established 4 fundamental components of asthma care: assessment and monitoring, patient education, control of factors contributing to asthma severity, and pharmacologic treatment. The panel concluded that improvement in the quality of care could be achieved through endeavors aimed at better prevention, detection, treatment, and education in the treatment of asthma.¹¹

In 2018, the NAEPP Coordinating Committee Expert Panel Working Group 4 was established to develop updates to the 2007 guidelines. The 2007 guidelines were essentially left intact;

however, the working group identified 6 additional topics to be included in the as yet to be published, updated guidelines.¹²

It is difficult enough to provide the patient teaching and reinforcement required for the successful management of a child with asthma in usual times, but the coronavirus disease 2019 (COVID-19) pandemic necessarily impacts the way families can manage the child's asthma as well as how the health care provider responds. As COVID-19 restrictions further complicate patient access, a more flexible approach to providing health care for the child with asthma is needed. A transition to the televisit as an alternative to in-office visits provides a well-timed option for managing the health of the child with asthma during the COVID-19 crisis and after.

Asthma and COVID-19

It has become increasingly clear that COVID-19 is a rapidly evolving virus with mounting unknowns. Based on the available preliminary findings regarding the general pediatric population, most children seem to be less susceptible to COVID-19 than adults.¹³ Initial clinical studies indicate that children with accompanying comorbidities such as asthma may be at greater risk of COVID-19 comparable to adults with similar comorbidities.¹⁴ However, at this time, there is not enough literature to indicate that COVID-19 could induce a viral-triggered asthma exacerbation in children.¹⁴ Information based on current Centers for Disease Control and Prevention knowledge does indicate that individuals with moderate to severe asthma might be at heightened risk of contracting COVID-19 and getting sicker and also at increased risk for asthma exacerbation that could lead to pneumonia and acute respiratory disease.¹³ Actions must be taken to slow the spread of all infectious diseases but, specifically, the transmission of COVID-19. Health care providers must consider mitigation measures and choose which ones to put in place to prepare for and respond to the transmission of COVID-19. Televisits will enable the health care provider to deliver care to any child with asthma in any community in real time during usual times, in a national emergency, or during a pandemic. This makes televisits more germane and unquestionably more likely to expand.¹⁵ This article offers health care workers the tools and guidelines to facilitate the implementation of televisits for children with asthma.

The Televisit

Although the terms telehealth and telemedicine are often used interchangeably, they have different definitions. Telemedicine is the technology that involves providing health care services remotely in order to share information on a diagnosis, a treatment, or disease prevention. Telemedicine technologies include programs for digitized examinations and remote patient conferencing and monitoring.¹⁶ Telehealth encompasses the use of phone calls, text messages, e-mails, or an online health portal that allows the patient to communicate with the health care provider.¹⁶ For the purpose of this article, the term televisit is used predominantly but may, on occasion, be interchanged with the term telemedicine as defined earlier.

Pediatric Televisits

The literature on telemedicine in pediatrics over the last decade has supported televisits as an effective means of delivering care to various populations of patients in many settings.¹⁷ In particular, for the child with asthma, televisits have been determined to be just as effective as in-person visits,¹⁸ and they are well-liked by families for the associated convenience and perceived quality of care.¹⁹ However, although the televisit is an accepted appointment type, the

success of implementation is guided by many factors and is not guaranteed. A poor Internet connection is not the only barrier to accomplishing the move of televisits into usual care. There are multiple considerations in play before telemedicine initiatives can be implemented into usual care. These include the patient's and the health care provider's social support and interaction, individual characteristics and resources, negative associations, and usability.²⁰ These criteria are interrelated, and, if approached holistically, the implementation of televisits is more likely to be successful.

Televisits for Children With Asthma

The goals for the televisit for the child with asthma are to 1) assess the child's current level of symptom control and identify loss of control; 2) to incorporate, evaluate, and promote asthma education; and 3) to allow for step-up or step-down options based on the current NHLBI/NAEPP asthma guidelines acknowledged earlier.

Televisits should be introduced carefully to the health care provider and the patient alike because both may be subject to or experience any of the barriers associated with televisit technology. Because of the highly contagious nature and inordinate spread of COVID-19,²¹ families may be reticent to venture out for a face-to-face office visit or a visit in any health care setting where they might be exposed to COVID-19. They may also be wary of the alternative of inviting the health care provider into the home. The health care provider will have to make important decisions with and for the patient in a new type of care delivery. To ease into the concept of the televisit, a personal, initial phone call to the patients' families to introduce the appointment type works best. This call can assure families of the health care provider's commitment to the health and well-being of every child in the practice, especially of those children with asthma, and that the children will receive the same medical care they normally would in a face-to-face office visit. Emphasis should be placed on the importance of ensuring that the children stay healthy. Acknowledging how difficult it can be to make and keep appointments, particularly during the current pandemic, the families are invited to participate in televisits.

Because the televisit is performed over the Internet, the family may fear that their protected health information or other information could be disclosed as a result of electronic or technical issues associated with computers and the exchange of electronic information. As with any technology, there are anticipated risks with televisits and, in rare instances, the possibility of a breach. The family should be assured that the institution has taken steps to ensure this will not happen. To address the patient's and the family's rights and concerns for the protection of their health, the American Telemedicine Association developed comprehensive practice guidelines to evaluate the quality, safety, and effectiveness of telemedicine visits and provide the necessary guidance for transition into telemedicine.²² For families agreeing to participate in televisits, consider obtaining consent for this appointment type. If the families ultimately decide not to participate in televisits, they should be assured that a safe "usual" in-office appointment can be scheduled.

To proceed with televisits, the family must participate in a personal health care portal. A personal health care portal is a secure online website that allows patients 24-hour access to their own personal health information through an Internet connection. Therefore, the families must also have a computer or smart device enabled with a video camera and Internet access. If the health care provider believes it is appropriate, the families can be supplied with an oxygen saturation (Po₂ saturation)/pulse oximeter monitor. Including oximetry in the televisit can detect hypoxemia in the child, which is an important sign of severe illness.²³ Independent

Table 1
Parameters for Evaluating Children With Asthma During a Televisit

	O ₂ Saturation	Age	Pulse (beats/min)	Respiratory Rate	Respiratory Effort Degree of Retractions
Acceptable range	> 94%	2-5 y	120-140	30-40/min	Absent or mild retractions
Actionable range	< 93%	> 5 y	100-125	20-30/min	Absent or mild retractions
		2-5 y	> 140	> 40/min	Suprasternal intercostal subcostal nasal flaring
		> 5 y	> 125	> 30/min	Suprasternal intercostal subcostal nasal flaring

health care provider research will determine which brand of the device best meets their requirements.

The families should also be given some variation of a clinical symptom grading system (eg, the Asthma Control Test [ACT]).²⁴ The ACT, a widely accepted asthma evaluation tool, is composed of 2 short quizzes. For children 4 to 11 years old, the child is asked to point to 1 of 4 illustrated faces depicting feeling sad (0) to feeling happy (3). On this version, there are also 3 questions for the caregiver to answer regarding the occurrence of asthma symptoms and the use of medication. The second version is designed for patients 12 years and older and asks for the patient's responses on a numeric score. Both quizzes are intended to provide a picture of the child's asthma health in a 4-week period before a usual care appointment, emergent office visit, or televisit. A low score for either quiz indicates poorly controlled asthma and should prompt a revision in the child's treatment plan, an office visit, or referral to emergent care.

Finally, if the family does not have one, the child will need a peak flow meter (PFM). A PFM is a handheld device that measures the peak expiratory flow rate and, if done correctly, can detect

constriction well before the appearance of asthma symptoms. PFM readings are assessed according to 3 zones of evaluation: green for doing well, yellow for symptoms that need attention, and red indicating a medical emergency.²⁵ The measurement of transcutaneous Po₂ in conjunction with the ACT symptom evaluation and PFM readings can indicate signs of mild obstruction before symptoms become severe. Even if the family is familiar with the Po₂ saturation/pulse oximeter, the ACT, and the peak flow meter from pre-COVID-19 in-office visits, a review of the devices and completion of the ACT can always be included in the first televisit.

To ensure consistency for the evaluation process, the health care provider would benefit by having guidelines for parameters to evaluate asthma symptoms. Specifically created for this televisit project and derived from several sources, a sample guideline can be found in Table 1.²⁶⁻²⁸ These parameters are not absolute and can overlap. The health care provider can then use the data collected to take appropriate action as outlined in the contingency chart also developed for this televisit project (Table 2). A contingency chart should be designed to provide instructions on what steps are

Table 2
Contingency Chart

Assessment	Action
Medical O ₂ saturation > 94% ²⁶ Asthma Control Test score > 20 PFM zone: green <ul style="list-style-type: none"> No reported complaints of Shortness of breath Chest tightness or pain Wheezing when exhaling Trouble sleeping caused by shortness of breath, coughing, or wheezing Coughing or wheezing worsened with a cold, flu, or respiratory virus 	Book follow-up televisit
O ₂ saturation < 94% ²⁶ and does not return to acceptable parameters after prescribed at home nebulizer or metered dose inhaler treatments <ul style="list-style-type: none"> Asthma Control Test score < 19 Peak flow meter zone: yellow or red Reported negative complaints of Shortness of breath Chest tightness or pain Wheezing when exhaling Trouble sleeping caused by shortness of breath, coughing, or wheezing Coughing or wheezing worsened with a cold, flu, or respiratory virus 	Book for next available emergent office visit or send to emergency department
Pharmaceutical Need for new prescriptions Need for refills Need for PFM or spacer	Make real time changes in EMR Send real-time prescription refills in EMR to preferred pharmacy Mail PFM or spacer
Administrative School and camp forms Asthma action plan Allergy action plan Medication authorization Poor technical connection	Edited/updated in real time in EMR and available in patient's PHCP Edited/updated in real time in EMR and available in patient's PHCP Edited/updated in real time in EMR and available in patient's PHCP Edited/updated in real time in EMR and available in patient's PHCP Attempt redial Rebook televisit if necessary

EMR = electronic medical record; PFM = peak flow meter; PHCP = personal health care portal.

Table 3
Outcome Criteria for Improved Management of Asthma

1. Validating the value of televisit appointments for managing asthma care in the pediatric clinical setting through
 - 1.1. Patient care improvements as reflected in the patient/parent learning and change in skills in managing the child's asthma
 - 1.1.1. Fewer beta-agonist medication refills
 - 1.1.2. Fewer hospitalizations
 - 1.1.3. Fewer emergency room visits
 - 1.1.4. An increase in prescriptions for inhaled corticosteroids
2. Demonstrating that the management of pediatric asthma as a chronic disease can be more effective using the Televisit model through 2.1. Fewer beta-agonist medication refills
 - 2.2. Fewer hospitalizations and emergency room visits
 - 2.3. More completed asthma action plans
 - 2.4. Fewer office visits for acute asthma
 - 2.5. Fewer prescriptions for steroid "bursts"
3. Identifying televisits as a health promotion that supports behaviors essential to the televisit's success
 - 3.1. Positive patient satisfaction survey
4. Evaluating provider compliance with implementing National Heart, Lung, and Blood Institutes asthma guidelines through the provision of a multifaceted approach to patient education and the control of environmental factors or comorbid conditions that affect asthma
 - 4.1. Documentation of the distribution of asthma medication administration and monitoring devices: spacers
 - 4.2. Documentation of a completed asthma action plan, allergy action plan, and/or medication authorization letter as needed

appropriate for a variety of circumstances. If any unforeseen issues arise during the course of the visit that require immediate attention (medical, administrative, technological, or otherwise), the health care provider would have at hand the appropriate administrative, medical, or pharmaceutical intervention or response. All the details of the televisit are documented, and updates are recorded in the child's medical record.

Documenting the Televisit

Many electronic charting programs allow for the development of templates for specific diagnoses. A script for charting a televisit with a child with asthma is very helpful in providing consistent collection of data, not only for the individual child who participates in televisits but also for in-office visits for children with asthma throughout the practice. A sample template created for this project is found in the [Figure](#). Templates can be tailored or revised as needed as best practice dictates. Ongoing improvement of the care environment of children with asthma has a measurable impact on the quality of care and the strategic management of outcomes. Associating treatment options with outcomes is precisely the science that can improve the value for the individual patient, for reimbursement to the health care organization, and for the asthma community as a whole.²⁹ Based on the NHLBI-EPR 3 guidelines¹¹ and created for this televisit project, [Table 3](#) provides measurable outcomes that can contribute to the body of evidence for telehealth technology application.

COVID-19 and After

COVID-19 has severely affected the rhythm of this country's health care system. In the effort to combat the spread of COVID-19, the country is being asked to voluntarily stay at home or shelter in place requiring restrictions to in-office visits. To maintain and promote the partnership between patients, their families, and the health care provider and to mitigate barriers to care in this environment necessitate a paradigm shift. Thoughtfully implemented televisits that use a variety of tools to elicit an accurate portrait of the child's health status are the keys to a successful transition to televisits. Applying the standards set by the NHLBI EPR 3 and NAEPP guidelines equips the health care provider with timely and accurate evaluations of a child's asthma status.¹¹ The health care provider knows that families who understand the mechanism of asthma engage in more effective communication, which supports greater collaboration with the health care provider on patient care

decisions. This, in turn, encourages families to be more compliant with medication and devices and improves the benefit from interventions to control asthma.³⁰ Creating communication through a user-centric, engaged, and collaborative televisit can be transformative in caring for children with asthma and their families. In usual times, the health care provider's use of telemedicine technology has the potential to help fill the gaps in primary care that result from a reduction in provider availability, a shortage of physicians, a maturing population, and ever-increasing costs.³¹ Other benefits of telemedicine would allow for access to after-hours clinic services, solve issues associated with travel or transportation, and aid in scheduling appointments. These gains can be recognized in times of COVID-19 and after.

It is hoped that this article provides health care providers with the tools that would facilitate the implementation of televisits for children with asthma.

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