




# Patient and Provider Satisfaction With Pediatric Urology Telemedicine Clinic

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## Abstract

The use of telemedicine continues to grow as more patients are receptive to this innovative way of providing health care. Multiple publications in telemedicine indicated high satisfaction for this service. This study focuses on the use of telemedicine in a pediatric urology clinic and examines 3 research questions: (1) How did patients' parents/guardians feel about their video appointments? (2) What were the experiences of novice telemedicine providers conducting postsurgical appointments via video? and (3) How did novice telemedicine providers' experiences compare to those of expert telemedicine providers?

## Keywords

patient satisfaction, pediatrics, quality improvement, telehealth, physician engagement, clinician–patient relationship, access to care, telemedicine

## Introduction

The use of technology in health care is rapidly increasing as more hospitals continue to seek innovative ways to increase access and reduce the cost of quality health care. Telemedicine has become one of the ways hospitals are increasing access to patients, especially in rural and underserved areas (1,2,3,4). This allows patients to have access to primary care as well as specialty care without the associated travel costs (5,6). Many studies of the benefits and acceptance of telemedicine have indicated high satisfaction rates and have been positive about the continued use of it (5,7,8). Shivji et al (9) examined patients' and clinicians' experiences with telemedicine as an alternative for pediatric preoperative assessments and postoperative assessment for routine, elective, and nonemergent cases. They concluded that telemedicine services were acceptable and effective for pre- and postsurgery assessments.

## Methods

### Background and Survey Construction

A pediatric urology surgeon established a telemedicine clinic in a remote area in a mid-western part of the United States to increase access to urology specialty care for patients in this geographic area. The originating

telemedicine clinic have iPads in the examination room for families to connect with the surgeon via a telehealth video software called *Vidyo*. She is assisted by the telemedicine nurse who schedules patient appointments and ensures video conferencing tools work effectively, allowing for easy viewing and diagnosis. Data were collected using survey questionnaires (18 questions, Figure 1) for the patient's parents. Surveys were validated by a social media online support group for mothers of young children and were later mailed to patient's parent. We interviewed providers with different levels of expertise in the use of telemedicine. The interview guide for providers consisted of 10 questions in figure 2 addressing their preparedness for using telemedicine,

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**Urology Telehealth Clinic Satisfaction survey**  
Please complete the survey below.

Question 1 and 2 pertains to the parent/caregiver of the patient of this clinic.  
Thank you!

1) What is your age? (In years)  
 Under 18  18 - 24  25 - 34  35 - 44  45 - 54  55 - 64  Above 65  
 Do not wish to answer

2) What is your sex?  
 Male  Female  Intersex  Other  Do not wish to answer

3) What is your employment status? (Check all that apply)  
 Employed for wages  Self-employed  Out of work and looking for work  Out of work but not currently looking for work  A homemaker  A student  Military  Retired  Unable to work  
 Do not wish to answer

4. Who typically brings the child to the telehealth (video) appointments?  
 Parent(s)  Guardian/Foster parents  Other

Please specify "other". \_\_\_\_\_

5) On a scale of 1- 10, with 1 being not satisfied at all to 10 being extremely satisfied, how satisfied are you with your telehealth (video appointment) experience?  
 1  2  3  4  5  6  7  8  9  10

6) How far would you need to travel to attend an appointment at the University of Missouri in Columbia?  
 Less than 10 miles  10 - 50 miles  51 - 100 miles  101 - 150 miles  More than 150 miles

7) How far do you travel to a telehealth (video) appointment?  
 Less than 5 miles  6 - 25 miles  26 - 50 miles  51 - 100 miles  101 - 150 miles  
 more than 150 miles

8) If employed how much work is missed for an appointment at the University of Missouri in Columbia?  
 Less than 1 hour  1-2 hours  3 - 4 hours  5- 6 hours  7 - 8 hours  more than 8 hours  
 Not Applicable

9) If child is enrolled, how much school is missed for an appointment at the University of Missouri in Columbia?  
 Less than 1 hour  1-2 hours  3 - 4 hours  5- 6 hours  7-8 hours  more than 8 hours  
 Not Applicable

10) If employed, how much work is missed for a telehealth (video) appointment?  
 Less than 1 hour  1-2 hours  3 - 4 hours  5- 6 hours  7- 8 hours  more than 8 hours  
 Not Applicable

11) If child is enrolled, how much school is missed for a telehealth (video) appointment?  
 Less than 1 hour  1-2 hours  3 - 4 hours  5- 6 hours  7-8 hours  more than 8 hours  
 Not Applicable

12) What are the positive aspects to your telehealth (video) appointment?  
 \_\_\_\_\_

13) What are the negative aspects to your telehealth (video) appointment?  
 \_\_\_\_\_

14) How many appointments have you missed/rescheduled at the University of Missouri Hospital in Columbia?  
 none  1-5  6- 10  11 - 15  > 15

15) How many telehealth (video) appointments have you missed/rescheduled?  
 none  1-5  6- 10  11- 15  > 15

16) How, if at all, might your care have been better if your appointment were in person?  
 \_\_\_\_\_

17) How, if at all, might your care have been worse if your appointment were in person?  
 \_\_\_\_\_

18) Please share any additional comments about your telehealth (video appointment) experience.  
 \_\_\_\_\_

Figure 1. Patient survey questions.

patient–physician experiences, challenges, opportunities for telemedicine, and advice for other physicians looking to integrate telemedicine into their practices (both instruments in Figure 1).

## Results

### Parent Response

We received 3 filled out surveys from the parents, out of the 7 we mailed. All 3 parents indicated a high satisfaction rate with using telemedicine; 2 of 3 parents rated their experience at 10 out of 10 and the third parent rated their experience at 9 of 10. Table 1 provides a detailed information of the responses by parents comparing their overall experience with telemedicine.

### Health Care Provider Responses

Health Care providers had an overall positive experience with telemedicine. A high satisfaction and enthusiasm with

telemedicine was observed across all providers regardless of the number of years of practicing telemedicine. Comparison of experiences among providers is provided in Table 2. Below are unique patient stories who greatly benefitted from their telemedicine clinics as well as providers' views on the future of telemedicine.

### Dermatologist Response

There are so many positives about using telemedicine, I can go on and on about stories. I am reminded of an elderly lady, who had bullous pemphigoid and was treated with fairly dangerous medications. Her condition had been misdiagnosed for several years before she came to my clinic. I diagnosed and treated her condition. She became my patient for many years and, at the end of her life, she made an in-person appointment to come say goodbye. I had never seen her in person before then. When you have a close relationship with your patient, they do that. So, making diagnoses that have not been made and having access to our expertise save lives, money, and time for our patients.

Telemedicine is exploding; a lot are using it now. It is not super easy, you still need people to make it work. It takes more than just the willing patient, provider, and technology. It takes operational support to make the appointment right, the technology run right, and straightening the communication. It's not so seamless. Remember that the same standard of care applies. If you can do it over telemedicine, great. If you really can't, just own up to it. Recognize that it's just technology and most things are just like in person—documentations, scheduling [are] just like in person.

### Pediatric Urologist Response

In the beginning it was tricky, knowing the right patient selection for this visit type, having the originating site nurse (telemedicine nurse) to perform the needed exam, close up view of the genitalia in children, but the delivery of care and education provided to the family are the same. The standard of care does not change. The technology aspect is perfect, except sometimes zooming into the genital area of the child gets a little tricky. The more challenging areas can be worked out as you figure out how best to bring the area of interest under view. You can also utilize notepads for illustrations to share with the family.

Some urologists think telemedicine should be offered only for post-op patients, but I am doing it for new patients and their families to assess them before they drive to my clinic for surgery. For instance, a baby boy had a condition called hypospadias. I don't have to do anything until at least after 6 months of life. Usually, they would have to come see me to examine the baby before surgery. The family lived almost 6 hours away from my clinic, but only lived 2 hours away from the telemedicine clinic. They didn't have to drive all those hours for a pre-surgery appointment because of the availability of telemedicine. The biggest benefit to these

## Telehealth provider Interview Questions

1. How many months or years have you been involved in the use of telehealth and what has been your experience with this innovative method of providing health care?
2. Did you have to train to use telehealth or did your education train you to provide health care in this setting?
3. How does your education factor into telehealth, was it easier or more challenging?
4. What are some of the positive impacts you have experienced while using telehealth?
5. What are some of the challenges you've encountered during this process?
6. Do you think more people are moving towards telehealth or is there a balance between the traditional way of providing healthcare and telehealth?
7. What do you think the future for telehealth looks like and what are some opportunities in this specialty?
8. Would you like to share any unique experiences while using telehealth i.e. patient interactions, policies making, etc.?
9. What advice will you give to providers who want to integrate the use of telehealth in their practices?
10. Do you have any final comments you would like to share with us?

**Figure 2.** Healthcare provider interview questions.

**Table 1.** Patient Demographics and Patient Experience/Impact of Telehealth Appointments.

Survey questions	Parent 1	Parent 2	Parent 3
1. What is your age? (in years)	35-44	35-44	45-54
2. What is your sex?	Female	Female	Female
3. What is your employment status?	Employed for wages	Employed for wages	Employed for wages
4. Who typically brings the child to the telehealth (video) appointments?	Parents	Parents	Parents
5. On a scale of 1-10, with 1 being not satisfied at all to 10 being extremely satisfied, how satisfied are you with your telehealth (video appointment) experience?	10/10	10/10	9/10
6. How far would you need to travel to attend an appointment at the University of Missouri in Columbia?	101-150 miles	More than 150 miles	101-150 miles
7. How far do you travel to a telehealth (video) appointment?	51-100 miles	51- 00 miles	6-25 miles
8. If employed how much work is missed for an appointment at the University of Missouri in Columbia?	More than 8 hours	More than 8 hours	More than 8 hours
9. If child is enrolled, how much school is missed for an appointment at the University of Missouri in Columbia?	N/A	N/A	More than 8 hours
10. If employed, how much work is missed for a telehealth (video) appointment?	3-4 hours	3-4 hours	3-4 hours
11. If child is enrolled, how much school is missed for a telehealth (video) appointment?	N/A	N/A	3-4 hours
12. What are the positive aspects to your telehealth (video) appointment?	"took less time"	"It was so easy and time saving"	"Do not have to travel for follow-up care"
13. What are the negative aspects to your telehealth (video) appointment?	N/A	N/A	"Had to move the camera back and forth between my son and I"
14. How many appointments have you missed/rescheduled at the University of Missouri Hospital in Columbia?	None	None	None
15. How many telehealth (video) appointments have you missed/rescheduled?	None	None	None

Abbreviation: N/A, not applicable.

**Table 2.** Provider Interview Responses.

Interview questions	Dermatologist	Pediatric urologist	Telehealth registered nurse
1. How many months or years have you been involved in the use of telehealth and what has been your experience with this innovative method of providing health care?	<ul style="list-style-type: none"> <li>• 26 years</li> <li>• “My experience with it has been very good”</li> </ul>	<ul style="list-style-type: none"> <li>• Almost 2 years</li> <li>• “Very rewarding”</li> </ul>	<ul style="list-style-type: none"> <li>• Almost 2 years</li> <li>• “Patients get the healthcare they need and can have questions answered in a short period of time.”</li> </ul>
2. Did you have to train to use telehealth or did your education train you to provide health care in this setting?	Yes	Yes	No
3. How does your education factor into telehealth, was it easier or more challenging?	“My education made it easier to practice tele-dermatology”	“It was easier for me; the only challenging part is positioning the camera to what I want to see. It’s easier when using the phone”	“Working on EHR, being a school nurse, working in hospitals and clinics, Continuing Medical Education (CME), made me comfortable with it.”
4. What are some of the positive impacts you have experienced while using telehealth?	<ul style="list-style-type: none"> <li>• Making diagnosis that haven’t been made</li> <li>• “Being able to reach patients who otherwise would not have access to your care”</li> </ul>	<ul style="list-style-type: none"> <li>• “Decreasing the amount of time and resources the families take to come see me”</li> <li>• “Decreases patient wait times for both local and long distance and opens up my schedule to see more patients”</li> </ul>	<ul style="list-style-type: none"> <li>• Patient get the health care they need.</li> <li>• It cuts down travel time</li> <li>• It is more convenient for some patients</li> </ul>
5. What are some of the challenges you’ve encountered during this process?	“Inability to perform certain procedures during a telehealth appointment”	“Improving the marketing, I have 5 slots and it’s not fully filled. The no show rate is too high”	“The use of technology for the elderly patients.”
6. Do you think more people are moving towards telehealth or is there a balance between the traditional way of providing health care and telehealth?	“Balance between the traditional way of providing health care and telehealth”	Balance between the traditional way of providing health care and telehealth	Balance between the traditional way of providing health care and telehealth
7. What do you think the future for telehealth looks like and what are some opportunities in this specialty?	“A lot are using it now! it’s not always easy, you still need willing patients, providers and the right technology to make it work”	“Including video visits from home for post op appointment, which means no facility fees for patients . . .”	“People are more receptive to it, might just take a while to get use to”
8. Would you like to share any unique experiences while using telehealth, ie, patient interactions, policies making, etc.?	“I remember an elderly lady . . .” (please refer to the Result section)	“A new baby . . .”(please refer to the Result section)	“A patient had lost . . .”(please refer to Result section)
9. What advice will you give to providers who want to integrate the use of telehealth in their practices?	<ul style="list-style-type: none"> <li>• It’s the same standard of care just as in-person visits.</li> <li>• If you are unable to do it, just own up to it.</li> <li>• Contact people in your field doing telehealth and learn some skills from them.</li> <li>• Scoot back and look into the camera so it doesn’t seem you are looking down at them</li> <li>• Do not yell and never count on your mute button.</li> </ul>	<ul style="list-style-type: none"> <li>• It not as challenging as you think it would be.</li> <li>• You need the right people who know the laws and the type of diagnosis you can bill for.</li> <li>• Choose diagnosis to be your guide, there is a subset of patients you can use it for</li> <li>• It’s can be rewarding and doesn’t decrease quality of care</li> </ul>	<ul style="list-style-type: none"> <li>• At least try it!</li> <li>• It may not be ideal for everything but when providers are well trained, it is very helpful.</li> <li>• Train each other to try it.</li> </ul>

(continued)

**Table 2.** (continued)

Interview questions	Dermatologist	Pediatric urologist	Telehealth registered nurse
10. Do you have any final comments you would like to share with us?	“Recognize that it’s just technology and most things are just like in-person, documentations, scheduling etc.”	“I love it! Hopefully I can make it more efficient and have more patients”	“Having the right technology is helpful!”

Abbreviation: EHR, electronic health record.

families is decreasing the amount of time and resources used to come see me. Also, my patients are not billed for the facility fees, an agreement offered by the originating health-care facility to help increase access to their local patients. They only get billed for my services.

Telemedicine is not as challenging as some providers think it is. They can choose a list of diagnoses that can be done via telemedicine. There is a large subset of patients you can use it for. It can be very rewarding and does not decrease quality of care. You need the right team, effective scheduling, technology and excellent communication between all parties involved in the process to perform this at a high level.

### Telemedicine Nurse

Telemedicine is positive in so many ways. Patients get the healthcare they need and can have questions answered in a short period of time . . . A patient had lost their self-esteem due to a condition of bedwetting. They were able to get a telemedicine appointment immediately which provided her with treatment options as well as additional resources that helped boost her self-esteem.

I have noticed the many benefits of telemedicine but encountered some challenges with the elderly population. Though it has been a challenge, some elderly folks are moving towards acceptance. Once they try it and realize it is face-to-face but only virtual, they are more receptive to it, though it might take a while for them to fully accept it.

### Discussion and Limitations

This study examined parents/guardians experience with telemedicine as well as providers’ experiences with using telemedicine. The results from parents’ experiences indicated high satisfaction with their appointments. They were pleased with the services provided in the pediatric telemedicine clinic and appreciated the time they saved using telemedicine instead of an in-person appointment. Health care providers also expressed high satisfaction with using telemedicine, from helping to diagnose a patient’s condition to increasing access to health care in remote areas.

Our studies had some limitations in the sample size. The sample size was not large enough to analyze varying responses from parents. We did not collect information about patient’s age, access to technology, educational background, and their English language proficiency to analyze how these

factors contribute to their telemedicine experience. Future research should collect data from a larger sample size and consider the impacts or relationships between the age of patients, access to technology, educational background, and English proficiency of parents and patients experience and perceptions of using telemedicine.

Telemedicine clinics can be used to bridge the gap of health care accessibility from any place at any given time. In a situation like the current pandemic, telemedicine has proven to be more beneficial to patients and providers than any moment in time. With technological advancements, patients have easy access to their health care providers. Although the above providers had different specialties, their practices have proven to be beneficial to their patients in terms of access to specialty care, bridging the distance gap with technology, building relationships with patients, and providing the same standard of care as if it were in person. All practitioners expressed the fulfillment they got knowing they were able to help families who otherwise would not have had access to their care and urge other practitioners to use telemedicine. “I will provide this service forever. It’s awesome!”(Pediatric Urologist)



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**Sandra Chrapah** is currently a PhD student at the University of Alabama, Department of Health Services Administration. She worked with the Missouri Telehealth Network team during her master's degree as a graduate research assistant. She is also the founder Yenma Foundation, a children's foundation whose efforts are to promote the well-being of children.

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**Rebecca Chitima** is a data coordinator at the Missouri Telehealth Network. She provides technical support for the Show-Me ECHO Project in evaluation and research, performance measures, data systems, and quality improvement.

**Elizabeth Malm-Buatsi** is a pediatric urologist and an associate professor at the University of Missouri Medical school. Her research interests include Laparoscopic surgery, Pediatric minimally invasive surgery, Pediatric renal (kidney) disease, Pediatric urology, and Robotic surgery. She was recently awarded 2020 Young Urologist award of the year by the American Urological Association.