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Telemedicine and Health Equity During COVID-19 in Pediatric Gastroenterology

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Introduction: Telehealth (TH) services rapidly expanded during the COVID-19 pandemic. This rapid deployment precluded the opportunity for initial planning of implementation strategies. The purpose of the quality improvement project was to understand the needs of nurse practitioners and examine TH procedures and interventions designed to promote high-quality, equitable health care for pediatric patients with gastrointestinal concerns.

Method: The Plan-Do-Study-Act model was used. Survey data from providers and families were collected and analyzed. They

were further illuminated through iterative dialog across the research team to determine the quality and efficiency of TH.

Results: A toolkit of strategies for promoting the quality and efficiency of TH was created according to the three domains of health equity: availability, accessibility, and acceptability.

Discussion: TH will be used in the postpandemic era. Institutions need to implement evidence-based strategies that ensure health equity across TH platforms to ensure excellent patient care. *J Pediatr Health Care.* (2022) 36, 124–135

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The design and conduct of this quality improvement project was in keeping with the institution's guidelines specific to the conduct of quality initiatives; it was determined that this quality improvement project was exempt from institutional review board review.

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KEY WORDS

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Although telehealth (TH) began in the late 1800s, these practices have grown exponentially during the COVID-19 pandemic (Bestsenny, Gilbert, Harris, & Rost, 2020; Board on Health Care Services, Institute of Medicine, 2012). TH platforms and other digital health innovations present a viable option to efficiently and safely provide some forms of patient care (Crawford & Serhal, 2020), but widespread usage by many health care organizations was previously uncommon. Such was the case for one quaternary freestanding children's hospital in the northeast United States. The capacity of their pediatric clinics to see patients in-person was sharply curtailed during the COVID-19 pandemic when state-wide guidance and organizational decisions required that all nonemergent care be delivered electronically. The gastroenterology (GI) nurse practitioner (NP) team immediately shifted their clinical practices to TH, but its rapid deployment precluded the opportunity for initial planning and design of virtual clinic visits (Health IT.gov, 2017). Initially, parental anxieties surrounding their child's health and provider concerns on providing quality patient care were paramount. As a part of implementing robust TH practices, promoting health equity for all patients and families was of primary importance. It could not be assumed that every family had access to the necessary digital technologies or the wherewithal to meaningfully engage in TH. In addition, it could not be assumed that the GI NPs and larger health care systems were positioned to deliver care in this manner. Of particular concern to the team was how to provide high-quality care to their patients whose families were under-resourced or had low health literacy.

This quality improvement project (QIP) was designed to determine the feasibility and efficiency of TH visits for patients, parents, and providers. Emphasis was on assessing whether care was equitable for all families and, where barriers were identified, to determine how best to address them. The Institute for Healthcare Improvement's (n.d.) Plan-Do-Study-Act model for conducting quality initiatives provided the structure for designing and operationalizing this project. The revised Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0; SQUIRE, 2020) guidelines provide the systematic framework for reporting this project's findings (Ogrinc et al., 2016).

AVAILABLE KNOWLEDGE

Telehealth

TH takes many forms; for this, QIP TH refers to NP-patient/parent communication using live (synchronous) audio-video conferencing, or in the absence of video capability, audioconferencing. TH uses the electronic transmission of health care data to consult new patients, provide diagnoses, conduct follow-up visits, and recommend treatment plans (Crawford & Serhal, 2020; Olson, 2018). It was originally designed to increase access for basic acute care to

select populations, including the military, prisons, and rural locations. As the digital divide has narrowed, varied clinical applications are now widely used across diverse populations and settings (Dorsey & Topol, 2016; Park, Erikson, Han, & Iyer, 2018). Patient enthusiasm for TH is much higher in younger populations, making it a popular care platform with unlimited potential for pediatric patients and their families (Park et al., 2018).

TH has distinct advantages. Health care providers can be more available to geographically diverse populations and allocate their time more efficiently to care for patients needing the most attention. TH also allows for greater multidisciplinary team involvement, creating a more patient-centric approach that is associated with improved patient outcomes (Kvedar, Coye, & Everett, 2014). Patients have generally reported high satisfaction with TH; it is convenient, reduces travel time and costs, and limits time away from their jobs (Kruse et al., 2017). During the pandemic, TH proved to enhance infection control by eliminating patients' and families' potential exposure to COVID-19 associated with onsite visits and conserve limited resources such as reducing the usage of personal protective equipment by hospital personal (Berg et al., 2020).

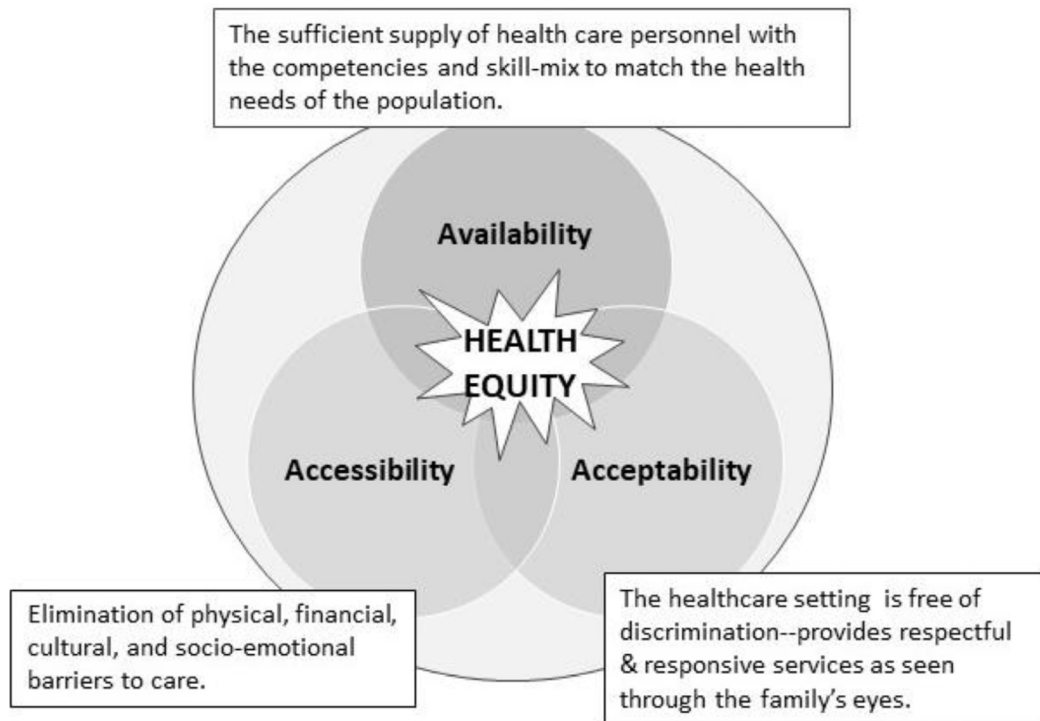
TH's major disadvantages for both the providers and the patients are a potentially less robust therapeutic relationship, inability to conduct a thorough physical examination, and incompatibility of available digital technologies (Dorsey & Topol, 2016). When a physical examination is needed, TH is not a preferred option as basic examination techniques—auscultation, palpation, and percussion—are not possible, and inspection is limited (Chaet, Clearfield, Sabin, Skimming, & Council on Ethical and Judicial Affairs American Medical Association, 2017). Health care providers must convey precise instructions and rely on the patients to follow their directions for some examination techniques and interpret findings despite not knowing what is normal; when important information is not captured, it imposes risks that can lead to further problems such as missed or incorrect diagnoses. Incompatibility between institutional software and patient digital devices, difficulty establishing or maintaining an electronic connection, and breaches in privacy are also common issues (Alverson et al., 2008).

Many organizations, such as the American Medical Association, American Academy of Pediatrics, and adult gastroenterology societies, have provided pediatric gastroenterology provider guidelines on implementing TH into their practice (Berg et al., 2020). However, across these guidelines was the failure to address specific considerations in conducting TH with under-resourced patients and families or those that have low levels of health or technological literacy.

Health Equity

Providing high-quality care requires that principles for achieving health equity are used in its planning and delivery. The U.S. Centers for Disease Control and Prevention (Centers for Disease Control and Prevention, 2020) defines health equity as “achieved when every person has the

FIGURE. Health equity framework



opportunity to attain his or her full health potential and no one is disadvantaged from achieving this potential because of social position or other socially determined circumstances.” The three central domains of health equity are accessibility, availability, and acceptability (see Figure). Health inequities are reflected in differences in length and quality of life, rates and severity of the disease, disability and death, and access to treatment. These will result in poor patient outcomes (Crawford & Serhal, 2020).

TH is generally viewed as an equalizer to providing care to diverse pediatric populations (Brophy, 2017; Utidjian & Abramson, 2016). However, TH creates specific health equity concerns for patients from families with fewer technological resources or poorer health literacy. Underserved populations have not historically used synchronous video communication as widely as other socioeconomic groups (Park et al., 2018). Providers must be prepared to address all aspects of the cultural, social, and economic barriers that come with TH.

Specific Site Information

The gastroenterology department schedules approximately 56,000 patients annually and has 11 clinic sites across eastern Massachusetts. The NPs are experts in managing GI issues, with an average of 15 years of experience working as advanced practitioners (range: 5–30). Their caseloads include patients from birth through young adulthood and span a wide array of acute and chronic conditions of varying levels of complexity. Most of these conditions are chronic;

many are exacerbated by stress and require expensive treatments. Carefully tracking their clinical course and proactive management of emerging issues is critically important.

The pandemic created an environment that allowed the symptomatology of many GI disorders to flourish, hindering patients’ health-related quality of life. Most patients seen in the GI Department are followed on a regular basis and have a long-term relationship with their NP. TH visits with their GI NP provided a lifeline for patients and families; without these visits and early intervention, patients would need to resort to seeking care in the emergency department with the potential for the hospital admission. The result would be a worsening clinical course, more expensive care, and, unfortunately, an increased risk of community or hospital exposure to COVID-19.

PROJECT RATIONALE AND SPECIFIC AIMS

Shortly after the rapid deployment of TH, NP anecdotal impressions supported that quality care for selected visit types could be rendered through TH, and these encounters are generally well-received by families. However, with a lack of objective data, it was not possible to clearly delineate strengths and weaknesses and thus limited the development of best practices for the use of TH across diverse populations. Specific aims of this QIP were as follows:

1. determine variables important to quality telehealth interactions (NP experience, “known” patient, the

- reason for visit, the sophistication of telehealth platform, NP's comfort with technology, working relationship with the supervising attending);
2. codify specific elements identified by NPs that impact the efficiency and effectiveness of TH interactions with families from diverse backgrounds;
 3. identify potential issues of health disparity when using TH as a primary method of health care delivery with children and their parents; and
 4. design a patient/family-centric toolkit for NP TH visits, with individual strategies appropriate for further testing.

METHODS

Context

A modified participatory action research (PAR) approach was adopted for this QIP. The PAR methodology addresses complex phenomena by intentionally engaging participants in sharing local knowledge while engaging them in obtaining relevant solutions for the community of interest (Fardi, Grunbaum, Gray, Franks, & Simoes, 2007; Jones, 2009). A specific goal of PAR is to improve health and reduce health inequities (Baum, MacDougall, & Smith, 2006). The team was composed of GI NPs ($n = 4$), a nurse scientist, nursing leadership ($n = 2$), and registered research nurses ($n = 2$). The team met weekly via Zoom (Zoom, 2020) to design, conduct, and evaluate this project. Every week, team members reflected on components of the TH rollout, adjusting their practices when possible. Each step is described later.

Plan

Joint Commission regulations and published evidence describing the use of TH with children with chronic/complex conditions were reviewed. Using this information and expert opinion, two data collection tools were designed for this project—the *Provider GI TH Data form* and the *Parent/Patient GI TH Data form*. Both instruments were adapted, incorporating new items specific to TH and GI care, from approved quality improvement forms already used by the hospital.

The Provider form contains six separate domains: (1) encounter characteristics (including International Classification of Disease, Tenth Revision, and current procedural terminology codes), (2) consultations, (3) electronic communication strategies employed, (4) visit complexity level, (5) call disposition, and (6) time involvement. Operational definitions for variables in each domain helped standardize data collection (Vessey, McCrave, Curro-Harrington, & DiFazio, 2015). The *Parent/Patient form* consisted of 10 Likert-style items specific to the patient experience and another three items comparing TH and onsite visit family-incurred costs; these items were adapted on the basis of published recommendations (Dávalos, French, Burdick, & Simmons, 2009; Henderson, Davis, Smith, & King, 2014). Iterative drafts of both instruments were trialed, evaluated,

and modified; final drafts were formatted into REDCap (Vanderbilt University, Nashville, TN), a secure web application for data management.

Do

Before data collection and in consultation with a statistician, it was determined a priori sample of 100 visits would provide sufficient descriptive data collected on the Provider GI TH Data form regarding the overall TH visit, and a sample size of 80 (two-sided 95% confidence interval with a width equal to 0.186 when the sample proportion was 0.800) would be adequate for the parent/patient survey. Before the initiation of data collection, the GI NPs trialed the Provider GI TH Data form to help ensure interrater reliability. Data were then collected on consecutive TH visits. The NP's recorded time spent on (1) preparing for the visit, (2) seeing the patient, (3) developing the management plan, (4) ordering medications and diagnostic tests, and (5) recording key information in the patient's electronic medical record. Finally, they recorded the TH platform used (e.g., Zoom [Zoom, 2020], SBR Health [SBR Health, 2020], Doximity [Doximity, 2020]) and the quality of the video and sound.

Parents/patients were asked at the visit's conclusion if they would be willing to be contacted regarding their TH experience by a research nurse. Families who agreed completed the Parent/Patient form over the phone within several days of the visit; data were later transcribed into REDCap. The GI NPs' then forwarded their completed tool to the research nurses. The GI NPs engaged in regular, unstructured discussions with the full QIP team about the challenges or barriers they faced while providing care with TH over the prior week. Key information from these discussions was captured for later analysis.

Study

Data garnered from the Provider ($n = 169$) and Parent/Patient ($n = 80$) GI TH Data forms were downloaded from REDCap into SPSS (IBM, Armonk, NY) for analysis. Descriptive statistics were calculated and are presented in Tables 1 and 2. To better understand the socioeconomic composition of this sample and look for differences in TH patterns, median household income was estimated using zip code status (University of Michigan, Population Studies Center, Institute for Social Research, & Morenoff, 2011). In the sample captured in the Parent/Patient follow-up interviews, 38.8% had an estimated median household income below the 50th percentile for this New England catchment area. Finally, the weekly information collected from the GI NPs illuminated these findings. The data from these three sources were triangulated to help create relevant solutions for the community of interest.

Act

Using the results from the Provider and Parent/Patient Data forms and information from the weekly QIP team debriefing sessions, specific health equity issues were identified and categorized according to the domain: availability,

TABLE 1. Characteristics of calls received

	Initial visit, <i>n</i>	Follow-up visit, <i>n</i>	Combined, <i>n</i> , %
Visit information and management			
Total visits	75	94	169, 100
Clinical management	75	91	166, 98.22
Patient education/anticipatory guidance	74	86	160, 94.67
Medication management/prescriptions	46	39	85, 50.30
Formula management/prescriptions	8	6	14, 8.28
Laboratory orders (in-house)	23	14	37, 21.89
Laboratory orders (external laboratory)	4	2	6, 3.55
Infusion orders	0	1	1, 0.59
Imaging orders and other procedures	15	8	23, 13.61
Scheduling follow-up appointments	68	65	133, 78.70
Getting outside medical records	12	2	14, 8.28
Ordering supplies/services	0	1	1, 0.59
Other	2	3	5, 2.96
Referrals			
Nutritionist	9	13	22, 13.02
Feeding team	3	5	8, 4.73
Social services	1	3	4, 2.37
Mental health	4	4	8, 4.73
Other specialists	5	4	9, 5.33
Insurance coverage/payment	0	1	1, 0.59
Communicated with:			
Administrative staff	27	54	81, 47.93
Gastroenterology nurse	1	2	3, 1.78
Gastroenterologist/other specialist	24	30	54, 31.95
Laboratory personnel	1	1	2, 1.18
Radiology personnel	0	0	0, 0
Social worker/psychologist	5	8	13, 7.69
Pharmacist	2	4	6, 3.55
Primary care provider	9	4	13, 7.69
Other	2	6	8, 4.73
Modes of communication used			
SBR	71	83	154, 91.12
Zoom	6	8	14, 8.28
Telephone	28	20	48, 28.4
E-mail	63	52	115, 68.05
Patient portal	0	2	2, 1.18
Electronic medical record message center	0	0	0, 0
Text message	0	0	0, 0
Interpreter	1	4	5, 2.96
Disposition			
Patients needs were met at the time of visit	55	74	129, 76.33
Outcome pending	20	16	36, 21.3
Onsite visit—emergent	0	1	1, 0.59
Complexity issues of encounter			
Literacy—English was not the primary language	1	3	4, 2.37
Poor health literacy	0	2	2, 1.18
Parental anxiety	0	0	0, 0
Socioeconomic limitations	1	0	1, 0.59
Parent developmentally limited	0	0	0, 0
Audio problem/failure	10	6	16, 9.47
Visualization problem/failure	5	7	12, 7.10
Time spent, min			
Preparation time (chart review, etc.)	10.73	6.74	8.46
Online	52.76	26.86	38.27
Follow-up (orders, documentation, etc.)	14.85	10.27	12.37
Total visit time			

accessibility, and acceptability. A toolkit was then developed (see Table 3). Strategies for some issues were deemed ready for immediate deployment, such as the flashcards to use with technological difficulties or working with schedulers to improve care coordination. Other concerns were outside of

the GI NPs' immediate scope of practice, such as connectivity issues with the TH platforms. Meetings were held with the respective personnel from other divisions in the hospital to share QIP data while suggesting potential solutions. Finally, other strategies will be further tested in future QIP

TABLE 2. Parents' perceptions of their child's telehealth visit

Item	Agree, n, %	Neutral, n, %	Disagree, n, %
I feel that this visit was beneficial in meeting my/my child's needs	78, 97.5	2, 2.5	0, 0
The nurse practitioner gave me her full attention during the visit	79, 98.75	1, 1.25	0, 0
There was enough time in the visit for me to process the information shared	78, 97.5	1, 1.25	1, 1.25
I had enough time to ask questions	78, 97.5	0, 0	2, 2.5
The process of connecting to the telehealth visit was easy to do	66, 82.5	5, 6.25	9, 11.25
I thought the quality of video was good	67, 83.75	8, 10	5, 6.25
I thought the quality of the (video and) sound were good	63, 78.75	10, 12.5	7, 8.75
I did not have any concerns regarding privacy	79, 98.75	0, 0	1, 1.25
I feel that my experience with telehealth was as good as if I were in an office visit	43, 53.75	20, 25	17, 21.25
I would participate in a telehealth visit again	78, 97.5	1, 1.25	1, 1.25

or formal research studies on the basis of urgency, complexity, and feasibility. For example, anecdotal information suggested that some families encountered extra expenses when trialing different formulas or copays associated with obtaining laboratory work or unanticipated patient emergency department visits and/or hospital admissions; additional data are needed to better understand the scope of the problem before positing solutions.

RESULTS

Interpretation

Every indication was that TH would become fully integrated into health organizations' care delivery. In a recent survey, McKinsey & Company reported that 76% of consumers want to use TH services moving forward, 57% of providers view TH more favorably, and 67% were comfortable with TH, and regulatory requirements have been widely expanded (Bestsenny et al., 2020). For TH to reach its potential in providing equitable, high-quality care to patients and families, prioritization must be given to addressing the impact of social determinants of health on implementation strategies (Park et al., 2018).

In this QIP, connectivity and communication were the major issues encountered. Our hospital uses a variety of technological interfaces. Synchronous video-based conferencing programs such as Zoom (Zoom, 2020), Doximity (Doximity, 2020), and SBR (SBR Health, 2020) were used for actual clinic visits. SBR (SBR Health, 2020) is designed specifically for TH and is Health Insurance Portability and Accountability Act (HIPAA) compliant. Unfortunately, in this project, it was associated with connectivity issues, primarily lower socioeconomic families who had technology with minimal capacity (i.e., chrome books). It also did not allow more than two parties (patient and provider) to participate at a time, limiting real-time care coordination. Doximity (Doximity, 2020) is a network for health care professionals used for calling patients using their office phone number, video conferencing, and faxing HIPAA compliant patient documents such as instructions, prescriptions, and clinic notes to sharing providers. These can occur while not disrupting personal cell phone information to conduct TH practices. Zoom (Zoom, 2020) is a video communication program that allows for HIPAA compliant video conferencing across all professional domains. For nonurgent issues,

asynchronous platforms such as the patient portal, secure e-mail, and telephone calls were used to communicate with patients.

Patient/family failure to successfully download apps, insufficient bandwidth, and interrupted transmission were all encountered, although the immediate five-state geographic area has some of the best broadband connectivity in the country (Cooper, 2018). Difficulty accessing an interpreter and maintaining interpreter services if technological difficulties occurred was also a concern. Although a technology helpdesk was available to all patients, families, and providers, delayed response times and the complexity of the issue often required that the visit be rescheduled.

Diverse platform options are recommended to meet the needs of different patient subgroups to improve TH adoption and use (Armbruster et al., 2020). Although multiple technologies can enhance communication, they also require that families are capable of using and monitoring multiple electronic information sources. When families failed to see electronic visit planning messages or successfully download connectivity software, visits were interrupted, canceled, or missed altogether. Ensuring that families were fully prepared for the TH visit was a challenge if all the visit preparation e-mails were not read or followed. For example, a common problem was that the child was not weighed before the visit. Another surprising issue was parents who did not include their child in the TH visit.

An organizational-wide plan is essential for TH to be both efficient and efficacious (Alverson et al., 2008); ideally, it should be designed for multiple family members (i.e., both parents, adolescent patients) to synchronously receive the same messages and participate in the calls when prudent. Examples include divorced families with shared custody or when the patient was at college, but their parent was at home. Prompts for families in which English is not the preferred language, standardized symbols, quick response codes, and other prompts on all materials will alert families regarding translation services.

Limited Internet and mobile band access and data fees sustain the digital divide across socioeconomic groups (Anderson & Kumar, 2019; Steele, 2016). As new, more sophisticated modalities are adopted by an organization, attention must be paid to their compatibility with basic technological devices and the amount of data time they use so as

TABLE 3. Telehealth toolkit components to address health equity concerns

Availability: The sufficient supply and appropriate stock of health workers, with the competencies and skill—mix to match the health needs of the population

Concern	Examples	Proposed solutions and resources
NP competencies	No specific TH training	<ul style="list-style-type: none"> • Develop and implement agency-specific in-service education: Components should include assessment of patient/visit appropriateness for TH, legal and ethical considerations, visit preparation guidelines for patients and providers, usage of technology and strategies for managing technology failures, billing strategies for TH, and caring for complex patients—with special attention given to promoting health equity • Work with the institution’s Virtual Visit Team to strengthen communication and training Useful materials: <ul style="list-style-type: none"> • <i>Advancing effective communication, cultural competence, and patient- and Family-Centered Care: A road map for hospitals.</i> The Joint Commission. Oakbrook Terrace, IL; 2010. https://www.jointcommission.org/-/media/tjc/documents/resources/patient-safety-topics/health-equity/roadmapforhospitalsfinalversion727.pdf?db=web&hash=AC3AC4BED1D973713C2CA6B2E5ACD01B
	Current NP students not receiving training in conducting TH visits	<ul style="list-style-type: none"> • Develop and implement NP student training materials: components should mirror those for in-service education (above) Useful materials: <ul style="list-style-type: none"> • A template for NP student training located within the Supplementary Materials
Interpreter services and availability	Limited English proficiency	<ul style="list-style-type: none"> • Need to proactively identify and arrange for interpreters before calls • Develop a system for electronic medical record “flags” to identify families in which English is not the preferred language • Work with schedulers to include agency or external certified interpreters on the TH visit
	Deaf or hard of hearing	<ul style="list-style-type: none"> • Confirm or schedule an American Sign Language certified interpreter
Adequate visit time	More time needed for physically and socially complex patients Need to maximize revenue to reflect the complexity of care provided	<ul style="list-style-type: none"> • Work with schedulers to create slots of different time lengths • Adopt E and M (Evaluation and Management) Current Procedural Terminology codes for social determinants of health E and M (Evaluation and Management) Current Procedural Terminology codes for social determinants of health (International Classification of Diseases-10-Clinical Modification Section Z55-Z65) Useful materials: <ul style="list-style-type: none"> • Codes are available at https://icd.codes/icd10cm/chapter21/Z55-Z65
Accessibility: Requires eliminating physical, financial, cultural, and socioemotional barriers to care	Physical barriers Equipment: Underpowered or older hardware/ outdated operating systems	<ul style="list-style-type: none"> • Conduct dedicated outreach • Work with the information technology department to implement HIPAA compliant alternatives to accommodate limitations in patients’/families’ computer and mobile devices • Provide technological support through the organization’s helpline • When video capabilities are lacking, schedule in-clinic visits whenever possible, otherwise offer telephone For patients and families: <ul style="list-style-type: none"> • When TH visits are scheduled, provide agency-specific information for patients to download and procedures for testing the applications before a visit • Include information on how to connect with the agency’s helpdesk
	Connectivity (patients): Difficulty downloading the application, compatibility issues, limited patient Wi-Fi ability	

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TABLE 3. (Continued)

Availability: The sufficient supply and appropriate stock of health workers, with the competencies and skill—mix to match the health needs of the population

Concern	Examples	Proposed solutions and resources
	Connectivity (providers): Audio failure during the call	<ul style="list-style-type: none"> Assess Wi-Fi ability before TH visits, include information in introductory e-mails (emphasize privacy concerns) For organizations and providers: <ul style="list-style-type: none"> Develop organizational-specific written procedures/algorithms for switching across platforms Work with the agency's virtual visit team to create a robust platform for integrating the electronic medical record, visit coding (billing system), and scheduling system Confirm uniform resource locators monthly to ensure that the guidance is up to date Provide providers with a laminated copy of key agency uniform resource locators and phone numbers useful in case of electronic failure Provide laminated connectivity flashcards to providers Useful materials: <ul style="list-style-type: none"> Downloadable and printable Connectivity Flashcards are located in the Supplementary Materials
Financial barriers	<p>Economic well-being: Loss of employment affecting insurance coverage, ability to pay prescription copays, purchase formula, etc.</p> <p>Copays: Extra copays associated with obtaining laboratory work, unanticipated patient emergency department visits, and/or hospital admissions</p> <p>Technology costs: Data costs for families with limited. Families report needing to buy extra equipment, data costs</p> <p>Obtaining weights: Families needing to buy the scale</p>	<ul style="list-style-type: none"> Include required assessment questions at each visit: <ul style="list-style-type: none"> Specific to changes in living situations, employment, and insurance coverage Ability to pay copays and others related to managing child's condition Refer to the social-work department to assist with insurance eligibility/coverage/redeterminations or new applications Use future Plan-Do-Study-Act cycles to complete chart audits to determine the scope of the problem and possible solutions Assess families' available technology, ask specifically about data charges and whether these are an issue Assess family's need; work with hospital or community philanthropic groups to purchase and send scales directly to families Useful materials: <ul style="list-style-type: none"> Center for Disease Control and Prevention: <i>Measuring Children's Height and Weight Accurately at Home</i>. Available at: https://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/measuring_children.html Downloadable version of <i>Boston Children's Hospital's Family Education Sheet: Weighing and Measuring Your Child at Home</i> is available in the Supplementary Materials Assess family's need; work with hospital pharmacy and formula companies to send samples directly to families
Cultural, socioemotional barriers	<p>Formula trials: Unable to give samples for families to try, necessitated more Rx and associated costs</p> <p>Embarrassed by the living situation; do not want to show inside of the house</p> <p>Poor health literacy</p> <p>The reading level of introductory TH e-mails are too high</p>	<ul style="list-style-type: none"> Audit missed visits; failure to schedule visits Conduct dedicated outreach by the provider or social worker Use the teach-back approach for assessing comprehension Useful information: <ul style="list-style-type: none"> <i>Simply put</i>. Centers for Disease Control and Prevention. Atlanta (2009). https://www.cdc.gov/healthliteracy/pdf/simply_put.pdf <i>Teach-back intervention</i>. Agency for Healthcare Research and Quality. Rockville (2017). https://www.ahrq.gov/patient-safety/reports/engage/interventions/teachback.html Check all reading levels for all patient/parent materials before dissemination; keep reading level ≤ grade 5; format

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TABLE 3. (Continued)

Availability: The sufficient supply and appropriate stock of health workers, with the competencies and skill—mix to match the health needs of the population

Concern	Examples	Proposed solutions and resources
Clinical care barriers	<p>Standardized agency TH e-mails only written in English, precluding all patients from accessing information</p> <p>Care coordination: Travel concerns when initial TH visit scheduled with NP who sees patients at a distant site</p> <p>Standardized templates</p> <p>Physical examination</p> <p>Specimen collection Supplies not readily available</p>	<p>appropriately reading levels can be calculated in numerous ways. One easy way is to use the function in Microsoft Word Useful information:</p> <ul style="list-style-type: none"> • <i>Assessing Reading Levels</i>. https://support.microsoft.com/en-us/office/get-your-document-s-readability-and-level-statistics-85b4969e-e80a-4777-8dd3-f7fc3c8b3fd2 • Ensure that there were visible symbols (e.g., quick response codes), links, or phone numbers to translation services on all e-mails and other patient materials • Quick response codes were easily developed using commercial or open-source software. Working with the information technology department and translator services, a Joint Commission/HIPAA compliant code can be created and implemented • Develop an algorithm for schedulers to help them look beyond “first available appointment” to improve coordination of care between TH and in-clinic visits • Development of modifying templates to be appropriate for both in-clinic and TH visits • Predetermine who needs a physical examination (e.g., new patients, etc.) and schedule for an in-clinic visit if at all possible • Address issue of double billing if TH visit is insufficient and in-clinic visit needs to be scheduled, resulting in additional copays, and so on. • No ready solutions available at this time; consider if specimens are needed scheduling an in-clinic appointment
Acceptability: Entails creating a health care setting free of discrimination. It is based on providing respectful and responsive services as seen through the child’s and family’s eyes Privacy and professionalism		<ul style="list-style-type: none"> • Ensure HIPAA and COPPA regulations are followed • Encourage parents and patient to have a private location for the visit • Provider’s name badge should be visible during the call • Ensure that all providers working from personal equipment have agency-approved privacy protections installed • When working from home, the environment should remain uncluttered, free of personal distractions (e.g., pets) • Consider using the organization’s virtual backdrop for TH visits Useful materials: • <i>Text of COPPA Rule</i>. https://www.ecfr.gov/cgi-bin/text-idx?SID=4939e77c77a1a1a08c1cbf905fc4b409&node=16%3A1.0.1.3.36&rgn=div5 • <i>Protecting Children’s Privacy Under COPPA: A Survey on Compliance</i>. https://www.ftc.gov/sites/default/files/documents/rules/children%E2%80%99s-online-privacy-protection-rule-coppa-coppasurvey.pdf
Creating trust virtually		<ul style="list-style-type: none"> • Test to see whether headsets or computer microphones provide the clearer audio. Place camera at eye level; the provider should sit back a little so as not to appear to be staring • Let families know if they need to look away at other materials • Lighting should be behind the provider; harsh light and glare

(continued on next page)

TABLE 3. (Continued)

Availability: The sufficient supply and appropriate stock of health workers, with the competencies and skill—mix to match the health needs of the population

Concern	Examples	Proposed solutions and resources
Patient concerns		<ul style="list-style-type: none"> • Conduct periodic audits and online surveys to evaluate practices • Provide information on standardized patient materials as to how families can contact the Patient Relations Department if they have a concern
<p>Note. NP, nurse practitioner; TH, telehealth; HIPAA, Health Insurance Portability and Accountability Act; COPPA, Children’s Online Privacy Protection Act. Selected items were also reported by <i>Armbruster et al. (2020)</i>, <i>Berg et al. (2020)</i>, <i>Dorsey & Topol (2016)</i>, <i>Orlando, Beard, & Kumar (2019)</i>, and <i>Kemery and Goldschmidt (2020)</i>.</p>		

not to shut out lower socioeconomic populations. Formalized backup plans for poor Internet-based connectivity are essential (Brophy, 2017).

During the data collection for this QIP, TH visits were the only option for nonemergent visits for either new or continuing patients. Generally, the GI NPs thought that TH was an excellent platform for most follow-up visits but establishing therapeutic relationships with some new patients was more difficult than when initial visits were conducted in-person. Social capital factors such as trust and engagement with the provider and organization are known to significantly positively affect patients’ perceived ease of use of, the usefulness of, and intention to use TH (Tsai, 2014). Incorporating these into TH protocols, using in-clinic visits for new patients, and maintaining the same provider are strategies that should be considered (Dorsey & Topol, 2016; Orlando, Beard, & Kumar, 2019). This QIP was not designed to capture routine follow-up visits that went unscheduled or those that were missed despite being scheduled. However, the GI NPs’ anecdotal impressions were that the patients and families might have lacked knowledge on how to use the technology or had health literacy concerns. Auditing missed visits and determining associated factors would help illuminate this issue and lead to better care coordination.

The inability to conduct a physical examination for some patients was problematic. Even with inspection, assessment capabilities were limited by the quality of the patient’s and provider’s cameras. When a physical examination was essential, TH alone was insufficient and may have contributed to health inequalities.

TH also prevented seamless transitions in care. When laboratory tests or other simple diagnostic procedures were ordered, they could not be completed at the time of the visit. The GI NPs reported that patients and families had to schedule separate appointments for diagnostic examinations, laboratory studies, or x-rays. Access to free formula samples and timely consultation with the attending were also not always available. These follow-up visits required families to assume the cost and time burdens associated with travel, parental leave time, extra copays, and others. Delayed care

could also be an issue. All contribute to excess health care use (Dorsey & Topol, 2016).

The literature supports that additional training in TH procedures is needed by experienced clinicians (Brophy, 2017; Clay-Williams et al., 2017). For example, in this QIP, the GI NPs had to modify their practices to match available technology. Preplanning and record review was essential. Having only a small laptop screen to use when conducting the visit, visual contact with parents and patients was interrupted when the GI NPs had to switch among screens to review information in the electronic medical record, consult formularies, order laboratory tests, and others. Including audio cues were necessary so that patients remain engaged. Interruptions in visual engagement interfere with the therapeutic relationship, critically important in advancing health equity for all families (Kemery & Goldschmidt, 2020). The GI NPs also needed to provide additional instruction not needed in in-clinic settings. For example, parents needed to be reminded that their child needed to be present for the TH visit. Documentation and coding strategies needed to be modified to capture total visit time, not just time “on camera.” Training specific to Children’s Online Privacy Protection Act regulations that place parents in control of providing personal information from children under the age of 13 years and the need for providers to share with parents/guardians about how such information will be used needed to be provided (Federal Trade Commission, 2017).

Finally, health care organizations must heed human factors and ergonomics principles when implementing TH (Carayon, 2017). For NPs conducting TH from their homes, computers configured with high-quality visual and audio capabilities, embedded decision support systems, and dual screens will maximize patient assessment and communication while meeting patient privacy concerns. Ergonomically correct workstations will help prevent provider injury.

Limitations

Albeit the information gleaned from this QIP is enlightening and useful, this project included only a small number of NPs from a single pediatric subspecialty outpatient clinic where

customarily the visits are conducted in-person. The model of care is highly interdisciplinary, typically including not only NPs but clinical nurses, physicians and physician trainees, social workers, dietitians, and professional personnel such as pharmacists. Administrative staff also are part of the care delivery model. Although all these individuals contribute to the work of the GI ambulatory clinic, they were not included in this exploratory project. The parent/family sample size ($n = 80$) was adequate but modest. In addition, the data collection tools used for the project were not validated instruments. Securing financial information such as comparing family expenses when conducting TH visits with in-person visits, rates of reimbursement for NP TH with in-person visits would all have added value to this project. Finally, families were not part of the team that planned this initiative, given the project emerged in the setting of a pandemic.

Conclusions

All indications are that TH will remain fully integrated into care delivery in the postpandemic era. Strategic planning, implementation, and evaluation were required to ensure that delivery strategies are designed to be “value added” by enhancing health equity for the children and families for whom we care.

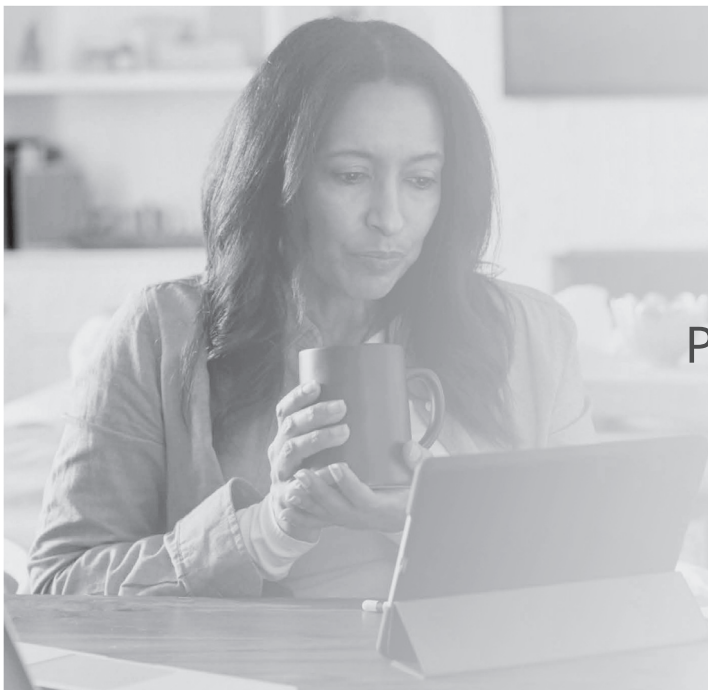
SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found in the online version at <https://doi.org/10.1016/j.pedhc.2021.01.007>.

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