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Exploring Telehealth to Improve Discharge Outcomes in Children

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ABSTRACT

OBJECTIVES: The inpatient to outpatient transition is critical for patient safety but suffers from lack of standardization and communication. Expanding telehealth use allows unique opportunities to leverage secure video conferencing to streamline communication between families and hospital-based providers (HBPs) after hospital discharge. We conducted a qualitative study to evaluate HBP and caregiver beliefs regarding a proposed telehealth follow-up visit after hospital discharge (THDF).

METHODS: Interviews were conducted with pediatric hospitalists, senior pediatric residents, and caregivers of patients recently hospitalized on the study hospital's pediatric hospitalist service. Authors developed consensus regarding major themes to inform THDF design. These were organized into a conceptual model.

RESULTS: We conducted 23 interviews with 6 hospitalists, 6 senior residents, and 11 caregivers. Three primary themes were identified: (1) Caregivers and HBPs agree THDF would be beneficial for patients and families; however, evidence is not robust enough to solidify provider buy-in. (2) Telehealth should supplement and enhance current discharge practices; it should not serve as a bandage for a broken system. Although a key aspect of THDF is to have the hospitalist provide follow-up care, this should be provided in addition to primary care provider follow-up. (3) HBPs expressed concerns about challenging workflows, competing demands, and inadequate resources, which are potential barriers to widespread adoption.

CONCLUSIONS: THDF leverages expanding telehealth use to provide hospital-based follow-up. While HBPs shared workflow challenges in conducting telehealth, HBPs and caregivers believed potential benefits of THDF outweighed the challenges. This qualitative study will guide implementation of THDF in future studies.

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There are over 10 000 pediatric discharges from US hospitals daily; however, without a widely used set of pediatric standards for hospital discharge, it is difficult to understand and improve the quality of discharge care.[1] This lack of standardization has been associated with adverse child health outcomes after leaving the hospital, with ~1 in 5 children experiencing a transition related adverse event, such as care complications and medication mismanagement, with some cases leading to hospital readmission.[1–3]

Hospital readmission has been associated with lack of postdischarge communication with the health care team, suggesting that improved communication may reduce readmission rates and decrease adverse events in the postdischarge period.[4] System modifications, such as standardizing discharge plans, enhancing physician skills in patient and caregiver education, and follow-up appointments with the hospitalist postdischarge, are promising interventions.[2,5]

Telehealth usage expanded during the coronavirus disease 2019 (COVID-19) pandemic, with a 63-fold increase in telehealth visits by Medicare Part B members between 2019 and 2020.[6] As telehealth becomes more broadly used, it provides the unique opportunity to leverage secure, face-to-face video conferencing in a follow-up visit between families and hospital-based physicians (HBPs) after hospital discharge. Such a follow-up visit could help reduce barriers to the inpatient to outpatient transition by helping families remain closely connected to the health system postdischarge. We sought to conduct an exploratory qualitative study with HBPs and caregivers to evaluate beliefs and needs regarding implementation of a pediatric posthospitalization telehealth discharge follow-up visit (THDF).

METHODS

This single-center qualitative study was conducted in a tertiary care, university-affiliated children's hospital that provides care for children across 33 counties, covering a geographic area of 65 000 square miles, with nearly 2700 patients transferred from referring institutions annually.[7] In the current state, a robust telehealth infrastructure is used to provide pediatric outpatient appointments and consultations to referring physicians. However, telehealth is not typically offered to pediatric patients who do not routinely follow-up with outpatient physicians within the system. Furthermore, because of time and space limitations, the hospital does not currently incorporate a routine mechanism for hospitalist follow-up, either by telehealth or in-person, after hospital discharge. Patients encountering a nonemergent problem after hospital discharge are instructed to follow-up with their primary care provider (PCP) or may reach out to the hospitalist on-call by telephone through the hospital operator.

A literature review informed development and refinement of the interview guide.[4,5,8,9] A purposeful sampling of 2 main groups that would be involved in the THDF, hospital physicians and caregivers, were recruited for in-depth, semistructured interviews based on their scheduling availability. Inclusion criteria were pediatric hospitalists, senior pediatric residents, or parents or legal guardians (referred to as "caregivers") of pediatric patients recently hospitalized on the study hospital's pediatric hospitalist service. Caregivers who were not primarily English-speaking, who were less than 18 years of age, or whose children were discharged from an intensive care or subspecialty service were excluded. PCPs were excluded in this initial exploratory study to first understand within hospital beliefs, before incorporating external stakeholders and partners. All participants received a $25 gift card for participation. Verbal consent was obtained. The UC Davis Institutional Review Board declared the study exempt.

Interview guides were structured to investigate domains described in the Consolidated Framework for Implementation Research (CFIR).[10] Each interview guide, one for HBPs and another for caregivers, contained 18 to 20 questions with potential probes spanning across CFIR domains: Intervention Characteristics, Outer Settings, Inner Setting, Characteristics of Individuals, and Process (Supplemental Tables 5 and 6).[10] The study team consisted of 2 pediatric hospitalists (including 1 qualitative research expert), 1 neonatologist, and 1 public health graduate student. Interviews were conducted by the public health graduate student to minimize bias in data collection. A theoretical workflow was presented to HBPs before interviews. Both HBP and caregiver interviews began with a brief description of the THDF. This theoretical workflow described that THDF visits were planned to be between the discharging hospitalist and caregivers, with the patient present, at a mutually beneficial time after hospital discharge. Exact workflows and patient population to receive THDF were intentionally unspecified, as these were elements we sought feedback on to design the intervention optimally. Physician interviews and 3 caregiver interviews were conducted through Zoom.[11] The remaining 8 caregiver interviews were conducted in-person at the study site. All interviews were audio recorded and lasted ~30 minutes.

Interviews were professionally transcribed and reviewed for accuracy. The study team (B.R., M.H., J.R., E.S.) performed coding and memo-writing using ATLAS.ti.[12] We used thematic analysis with an iterative approach whereby analysis occurred concurrently with data collection to allow adaptation of processes to focus on emerging topics.[13,14] The process included: (1) individuals open-coded the first 3 interviews; (2) full group met to discuss findings, distill open coding into categories, and generate a codebook; (3) adapted the interview guide based on initial codes; (4) individual memo-writing and coding of next 3 interviews using the previously developed codebook while remaining open to emergence of new codes; (5) full group met to compare codes, discuss discrepancies, refine existing codes, add new codes, develop tentative categories, and identify theoretical direction. The process was repeated for each following group of 3 or 4 transcripts.

Interviews were conducted until thematic saturation was reached. At this point, the categories were fully developed and demonstrated conceptual coherence, and the codebook was finalized. Original interviews were recoded based on this final codebook. Individuals reviewed the final coded data to identify major themes. The full group then met to discuss and develop consensus regarding major themes

and relationships between themes to inform THDF design. These hypotheses were organized into a conceptual model, which was disseminated to study participants to obtain respondent transactional validation.[15] Participants were asked to comment on accuracy of results to obtain high levels of accuracy and consensus between the research team, participants, and data. Additional data validation occurred through analyst triangulation.[16] We adhered to the COREQ criteria for reporting qualitative research.[7]

RESULTS

We conducted 23 interviews with 6 attending physicians, 6 senior residents, and 11 caregivers (Table 1). A summary of the thematic analysis follows. Tables have been provided for each theme

TABLE 1 Demographic Characteristics by Group	
Characteristic	N (%)
Providers	
Age, y	
20–29	2 (17)
30–39	8 (67)
40+	2 (16)
Gender	
Male	3 (25)
Female	9 (75)
Race	
White	6 (50)
Asian	5 (42)
Mixed	1 (8)
Experience	
2nd year resident	2 (17)
3rd year resident	4 (33)
1–9 years postresidency	4 (33)
10–29 years postresidency	2 (16)
Caregivers	
Age, y	
20–29	4 (36)
30–39	4 (36)
40+	2 (18)
Declined	1 (10)
Gender	
Male	2 (18)
Female	9 (82)
Race	
White	5 (46)
Hispanic	2 (18)
Black	2 (18)
Mixed	2 (18)

containing detailed results and supporting quotations arranged according to CFIR domains.

Theme 1: Caregivers and HBPs Agree THDF Would Be Beneficial for Patients and Families; However, Evidence Is Not Robust Enough to Solidify HBPs' Buy-in (Table 2)

Both HBPs and caregivers thought THDF would benefit patients. Participants commented on the convenience and ease of telehealth, sharing that THDF can improve overall patient safety and quality of care.

When sharing the various benefits of telehealth, some physicians stated specific circumstances that would promote their adoption of THDF, especially specific patient complexity factors and needs that may benefit from THDF. However, HBPs had contrasting thoughts on which patients should be offered THDF and provided various examples of who could be the target patient populations and best candidates for THDF.

Although HBPs and caregivers described many potential benefits of THDF, a few physicians expressed hesitation about implementing a new discharge follow-up workflow without seeing clear evidence of its benefit.

Theme 2: Telehealth Should Supplement and Enhance Current Discharge Practices; However, It Should Not Serve as a Bandage for a Fragmented System (Table 3)

Both HBPs and caregivers reported difficulties connecting patients with physicians after a child's hospital discharge. However, they expressed that this intervention may be a good option in providing "the best care that we can with a fragmented primary care health system" (Physician 1). Participants expressed it should be a supplement to current discharge practices, not a replacement.

Furthermore, participants shared that THDF could allow for improvement in continuity and coordination of care. However, some HBPs shared that unintended consequences may include overstepping boundaries with the PCP, delaying reconnection to patients' medical home, or increasing costs for physicians and the health care system.

Overall, participants believe THDF could supplement current discharge practices, provided stakeholders understand its limitations and use it appropriately without expecting THDF to replace necessary in-person follow-ups.

Theme 3: Challenging Workflows, Competing Demands, and Inadequate Resources Are Potential Barriers to Widespread Adoption of Telehealth (Table 4)

Although participants agreed the hospitalist is the most logical person to conduct THDF given their familiarity with the patient, HBPs thought this would come at a cost to their already busy workflows. However, as HBPs believed the benefits of THDF outweighed the consequences, they provided some potential solutions, including clinical hour attribution clarity, designated time

TABLE 2 Theme 1: Caregivers and Physicians Agree Telehealth Is Beneficial for Patients and Families; However, Evidence Is Not Robust Enough to Solidify Physician Buy-in

Individual Characteristics: Knowledge and Beliefs About Intervention	
Subthemes	**Supporting Quotations**
Convenience and ease of telehealth	
a	Convenient and cost effective for patient	"[Telehealth follow-up visits are] really super helpful. And, yeah, like I said, the gas is super expensive right now. And I have to pay parking all the time in the hospital. So, it's better like this. It's going to save me a lot of like everything – time and all the stuff – the traffic." (Caregiver 2)
b	Easy for parent to implement in current schedule	"[My child] just has a lot of appointments, in general, with different people. So, sometimes, telehealth or doing things through video can be easier when she doesn't need to be seen in person. Because it saves me like driving time, having to try to get her ready, get her out of the house, make sure I have everything. You know … she sees a lot of specialists and a lot of them are here, in Sacramento. But we live three hours away. So, sometimes, that would just be like easier to fit into a schedule." (Caregiver 11)
c	More comfort for patient at home, so physician can see recovery within familiar setting	"I think there is an advantage, sometimes, to watching kids in their own environments, which can be very different, you know, in terms of how they interact in a clinic setting versus in their own environment." (Physician 10)
Improve safety	
d	More patient adherence to follow-up if it is easier	"The family would have that continuity of care. And I think there's a lot to be said for the family being like, 'Oh, that's the doctor who took care of my child in the hospital and it's that same doctor who's telling me something now,' and would probably increase their trust in the medical care and what they're prescribed. And, you know, they would – I think it might increase like their adherence or compliance with things." (Physician 11)
e	Useful for checking medication regimen and laboratories	"We had a family who were supposed to be on steroids every day and then decrease the dose every 10 d, but they interpreted that as take a dose of medication only once every 10 d, and so they obviously missed a ton of their medication and they came back to the hospital, had to be rehospitalized probably because of that, so it would clarify questions like that." (Physician 4)
f	Reduces exposure to infection from hospital visits	"This helps keep people out of the hospital who don't need to be … because like the last thing I want is to have to go sit in a waiting room for 45 min to an hour with a bunch of sick people with my already immune-compromised child, you know, just to be like, 'Hey, he has a fever.' And they're like, 'Oh, it's nothing. He's teething.'" (Caregiver 6)
g	Can relieve parent anxiety	"I think, also, the peace of mind and like decreased stress that that would put on parents trying to figure out the answers or taking the kid in again. Like I think that would be really, really helpful for parents, for sure." (Caregiver 7)
Improve quality of care	
h	Could improve trust in physicians and health care system for high quality care	"[THDF could] potentially decrease readmissions in some cases … and could improve patient experience, and so increase the likelihood of them returning to [us] for subsequent care." (Physician 6) "Oh, that would be so good. I think that would really help, too. Because the family would have that continuity of care. And I think there's a lot to be said for the family being like, 'Oh, that's the doctor who took care of my child in the hospital and it's that same doctor who's telling me something now,' and would probably increase their trust in the medical care and what they're prescribed … I think it might increase their adherence or compliance with things." (Physician 11)
i	Can improve equity in medicine	"I think, you know, for many patients … not having to drive in and come and sit in a clinic setting, you know, is a very positive thing. I think it expands access to care." (Physician 10) "[THDF] has the potential to be fairly equitable or at least improve equity as an additional tool for people that can't make it into the clinic." (Physician 4)
Outer setting: patient needs and resources or cosmopolitanism	
Individual case complexity factors	
j	Special health care needs and complexity of cases may indicate benefit from telehealth use	"Any of our really complex discharges – kids who have had prolonged hospitalizations for one reason or another and are being discharged either with new diagnoses or new meds … I just think, by virtue of having a long hospitalization, they might need an additional touchpoint when they leave the hospital." (Physician 9)
k	Physical exam cannot be done in telehealth properly and may require in-person visit	"But, again, if it's something that is going to be really complex and it's really important for them to see someone in person after they're discharged then I'll let the family know." (Physician 3)

TABLE 2 Continued	
Individual Characteristics: Knowledge and Beliefs About Intervention	
Subthemes	Supporting Quotations
Health care access factors	
l Lack of continuity of outpatient care is a factor in offering telehealth	"Sometimes, you can't get an appointment even within the first week of being discharged … So, it's like, sometimes, you're a week or 2 out. And that's a long time to have to wait to see a doctor for something … the telehealth, I really think, would bridge that gap and really help prevent more things from happening negatively after discharge, or negative outcomes from happening." (Caregiver 6) "Complex chronic patient population as well as our population that has limited resources, so, for example, our immigrant population who may still be navigating getting plugged into medical care, even having health coverage." (Physician 6)
m Rural or remote communities with difficulty in health care access could benefit	"We live in Redding just two hours north of Sacramento and … it's not the worst but medically we don't always have the best options and we've already kind of discussed maybe coming down here to get him help in certain things … and so, if it was … something that they did not have to be touching him, that's incredibly helpful for us because not having to drive two and a half hours every single time he needs a visit for like small stuff would be incredibly helpful." (Caregiver 1)
n Allows for access to higher quality health care and improves continuity of care for families traveling long distances	"We live 3 hours away. And I just choose to bring her here because I like the care here and I feel like she, just in general, gets good care here … the fact that it would be kind of the same team that was already caring for them. And then, you're not just kind of switching between like a bunch of different doctors and having to re-explain what happened … the fact that it's like consistent care with the same people." (Caregiver 11)
Intervention characteristics: evidence strength and quality	
Physician buy-In factors	
o Physicians need to understand the need for telehealth	"I don't really know if patients have had the opportunity to or we've had the opportunity to really see what the benefits are and what the missing things are and where this will fill the gaps." (Physician 2)

and space, and understanding responsibilities. Other potential barriers to adopting telehealth included technological issues and lack of structure to intervene in case of an emergent issue postdischarge.

Overall, despite sharing prior workflow and technological challenges in conducting telehealth, both HBPs and caregivers thought they were well-equipped and comfortable with implementing the intervention itself, with the primary barrier being lack of HBP time and absence of a clearly defined workflow.

Conceptual Model

There were 4 key CFIR domains that played a role in our study: Outer Settings, Inner Setting, Characteristics of Individuals, and Intervention Characteristics.[10] Although THDF can improve many factors within the Outer Settings, such as continuity of and access to quality care, current issues within the Inner Setting, like HBP workflows and technical limitations, must be addressed through Intervention Characteristics. A conceptual model of our findings and future directions categorized using the CFIR is provided (Fig 1).

DISCUSSION

This single center study explored HBP and caregiver perspectives of a proposed THDF. Themes revealed that HBP and caregiver participants think that THDF would be beneficial for patients and families; however, evidence is not robust enough to solidify provider buy-in. Telehealth should supplement and enhance current discharge practices

and be provided in addition to PCP follow-up. Additionally, although theoretical THDF was well-received by both groups of participants, HBPs expressed many logistical challenges that warrant further investigation and planning before widespread implementation. Knowledge gained from this qualitative study can be used to guide the design and implementation of THDF to be tested in future studies.

It is important to emphasize that this study is exploratory in nature. Although HBPs and caregivers in our study expressed that THDF may improve patient safety and outcomes, reduce readmissions, and increase trust in our health care system, these are all beliefs that have yet to be proven. Additionally, the exclusion of PCP beliefs, to first understand within hospital perspectives in this study, is important to note. Existing literature supports the promise of THDF as a beneficial model of care delivery. One review study found that using tele-homecare communication tools for premature infant postdischarge early follow-up across multiple studies resulted in positive outcomes for the patient and family, with improved parent satisfaction and readmission rate reduction.[17] Another study examined a telehealth program to monitor and collect patient vitals wirelessly, while providing heart failure patients with instructional videos and subjective questions about symptoms related to heart failure, showed a reduction in readmission rates.[18] Additionally, another study providing heart failure patients with telehealth through biweekly telephone support after discharge for 12 weeks showed significant improvement in symptoms, satisfaction, and patient adherence.[19]

TABLE 3 Theme 2: Telehealth Should Supplement and Enhance Current Discharge Practices; However It Should Not Serve as a Bandage for a Broken System

Intervention Characteristics: Relative Advantage

Subthemes		Supporting Quotations
Current infrastructure issues		
a	Infrastructure improvement in outpatient setting rather than the inpatient setting may be a more long-term solution	"By us filling that gap with hospital-based care, instead of supporting improvements in the outpatient infrastructure, essentially it becomes a workaround rather than that patient actually just having better access to care right in the community. So, I just fundamentally think that we should support people getting that better care that they need within their community structures." (Physician 1)
b	Telehealth cannot replace in-person visits	"I think it can reach a lot of people, but at the same time it's not a replacement for going to actually see an actual doctor at a clinic." (Physician 2)
Telehealth as a supplement		
c	Telehealth in addition to in-person visits can improve the current postdischarge care	"I feel like they're both needed. So, it's one of those things that like one isn't better than the other. They're both — I think, done together, the best care would be then provided." (Caregiver 6)
d	Telehealth can approximate in-person care	"My perception is that they're not all that different … most of my telehealth visits have been pretty easy and like pretty straightforward and the family … seems grateful and they get their questions answered and like things generally seem to go well … specifically in the setting of like post discharge stuff, I, my perception is that … the quality is fairly equal." (Physician 4)
Outer setting: peer pressure and external policies and incentives		
Physician role responsibilities		
e	Good to have the physician who knows the child's hospital stay history do the telehealth	"I think there's a lot of benefits to saying 'Okay, have patients been taking their meds as they were instructed, have they scheduled, been able to get certain appointments or labs. Have they been able to improve in a way that we're expecting' and I think this has a lot of potential to prevent patients from coming back to the hospital, but I think the other reality is that patients can be very sick and … it all falls on the patients' parents right now to do all that so having a Tele health follow up visit can really help to establish and bridge that." (Physician 2) "Well, I think the whole different thing about that is like you're actually talking to the doctors that you've seen here. Like, when we do follow up visits, like especially parents that live far away, we are seeing our doctors at home. And so, they're just getting a message that they receive from the hospital, you know, instead of like an actual person that you talk to. So, I think that's the main difference." (Caregiver 10) "The only way [THDF] would not be helpful [is] if it wasn't the people who have seen [the child] previously." (Caregiver 6)
f	Confusion in role responsibility between hospitalist, specialties, and PCP leading to issues in transfer of care	"I think, if we have them rely more on us than their medical home … it could potentially undermine that relationship or getting them plugged back into the resources that … support them more long-term." (Physician 6)
Inner setting: culture and networks		
Potential telehealth limitations		
g	Physicians need to know when a video visit is appropriate and the limitations of telehealth	"So, I think just having clear expectations for what needs to be done at the visit would help from both people's perspective … If it was to be a telemedicine, I think the expectations for the patient and their family would just have to be clear that this is a video visit. So, things might be limited. Like we can't do a full exam." (Physician 11)
h	Need to make sure biases are not a part of decision to offer telehealth	"How do we make sure that there are no biases? Or not that there are no biases. Because we can't take it away completely. But how do we minimize our own biases in making the choice to offer it if it's going to be something that is a physician choice?" (Physician 10)

Although prior studies have not explored our exact suggested intervention and our predicted outcomes are all based on hypotheticals, where we have provided a theoretical workflow for the proposed THDF, the prior studies exploring various forms of telehealth to improve continuity of care and patient outcomes support our predictions. To demonstrate its utility, the intervention must be implemented in a pilot study to collect the necessary data. However, this study was conducted to explore and evaluate the beliefs and needs of caregivers and HBPs before implementation, to inform the design of the THDF intervention.

TABLE 4	Theme 3: Challenging Workflows, Competing Demands, and Inadequate Resources Are Potential Barriers to the Widespread Adoption of Telehealth	
Inner Setting: Structural Characteristics		
Subthemes		**Supporting Quotations**
Current follow-up care responsibilities		
a	Confusion in role responsibility between hospitalist, specialties, and PCP	"I don't think it's like a really structured process for the inpatient physicians to make sure that those kids get outpatient follow up ... We emphasize the need to do it, and then we just trust that they're going to do it for the most part." (Physician 4)
b	Parents primarily in charge of scheduling follow-up in current workflow	"I don't think we have anybody that oversees [follow-up after discharge]. I mean depending on the patient for sure ... to make sure that they have an appointment scheduled before they leave and let them tell me who it is, where it is, what time. Not for all patients, but the ones I'm worried about as far as follow up goes and making sure they're plugged in, but nobody actually ensures that people follow up." (Physician 7)
Physician workflow and responsibilities		
c	Follow-up visit would be an additional responsibility for inpatient physicians with already busy workflows	"When is it fitting in this schedule, who's doing it, how does that get clinically counted for people, how does that count into their clinical work expectations, and how does that not adversely impact the residents and students and people with whom you would usually be spending that time teaching." (Physician 1)
d	Telehealth can be useful, but implementation and context in care is important	"I mean that'd be great. I would love to have follow up from like the kids that I took care of inpatient. My comfort level with like actually setting it up and coordinating it is less because I don't have necessarily like the time ... as my schedule currently stands ... but in terms of like the comfort of doing a visit with those people I would, that would be great. I would feel comfortable." (Physician 4)
e	Established workflow is crucial for physician usage	"I think making the process as smooth as possible ... giving us a lot of time to do them, because I think everyone in the group is here, because they want to take care of kiddos and everyone's eager to make sure they have the best care they get. But I think ... you juggle so much outside of here and in here that ... it would need to be a smooth process as far as making the appointments, the programs that we use, whether it can be done here at home, and then ensuring that we have clinical time to do it." (Physician 7)
Assistance for telehealth		
f	Quickly accessible instructions for telehealth (video or paper)	"Training probably needs to be mixed picture of both online kind of things that people can refer to for documents or videos" (Physician 2)
Individual characteristics: self-efficacy		
Technological factors		
g	Issues with wifi or broadband and technology may be barriers for telehealth visits	"Definitely, a lot of technology troubles. Most frequently like the video ... you can see them and can't hear them or you can hear them and can't see them. It's one of those, so then we end up like calling them on the phone and sometimes like using the video as an adjunct to the phone or sometimes just switching to the phone completely." (Physician 4)

Our study showed both HBPs and caregivers believe THDF could reduce subsequent readmissions, contrasting with prior work suggesting follow-up may actually increase readmissions. One study conducted a pediatric transition intervention with nurse home visits as a method of follow-up care.[20] Compared with controls, children who received follow-up through nurse home visits were more likely to reuse health care within 30 days.[20] Another retrospective cohort study analyzed predictors of increased 30-day readmission, finding that documented PCP follow-up before discharge was associated with increased likelihood of readmission.[21] Notably, both of these studies analyzed the impact of follow-up with a different health care provider from the one who saw the patient while hospitalized. Thus, it is possible the follow-up provider's lack of familiarity with the child's overall disease course may have contributed to flagging expected clinical symptoms as warning signs, contributing to unnecessary readmission. These studies highlight the value of offering follow-up care conducted by a physician who has been a part of the patient's hospitalization and knows the patient's overall trajectory, a point also emphasized by participants in our study.

Additionally, telehealth emergence provides an opportunity for follow-up care to be conducted more easily and allows for unique interventions. A recent patient survey found that telehealth improved communication, decreased expenses and travel time, decreased disease exposure, and was easy to use.[22] Physicians, however, were less satisfied, with concerns about technological issues and difficulty incorporating telehealth into current practices.[22] Although our study identified similar needs, there were some differences. Physicians in the prior survey had concerns about lack of in-person communication leading to a compromise in the patient-physician relationship.[22] HBPs in our evaluation believed THDF could improve the patient-physician relationship and increase trust in the
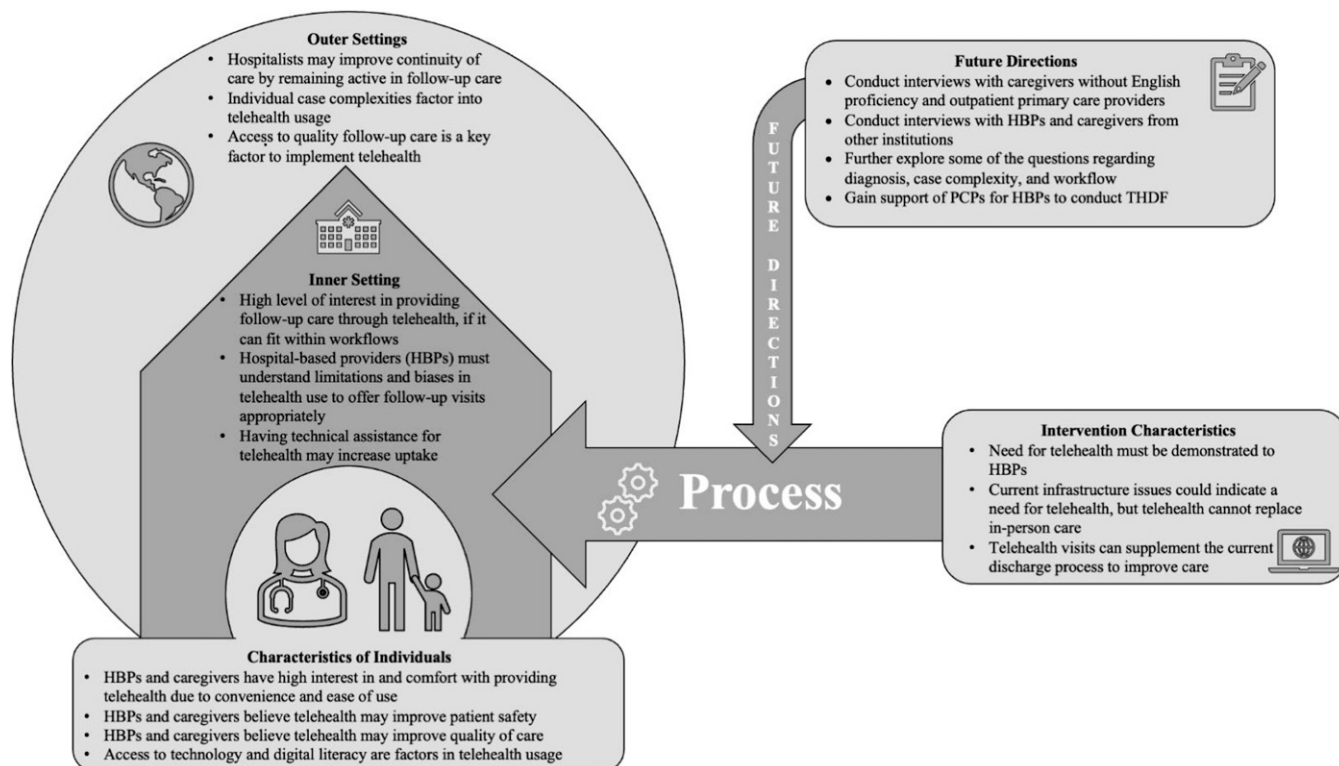
FIGURE 1 A summary of the findings of our study and future directions categorized using the CFTR domains.[8]

health care system. Physicians in the prior survey believed telehealth too difficult to use because of technological difficulties, but HBPs in our evaluation believed they were prepared to use telehealth with ease if their workflow allowed for it.[22]

Although this qualitative study has provided rich insight into perspectives on THDF, it is important to note that this study focuses on implementing these visits in 1 setting. Participants are all associated with a single center. Other centers may have different needs and workflows, which were not explored, thus limiting generalizability of these findings. Furthermore, this study did not include caregivers with limited English proficiency or outpatient primary care providers. Whereas few prior studies have elicited PCP views on hospital-based follow-up clinics, 1 study evaluating a hospital-based clinic for children with medical complexity found widespread support among PCPs, although some did feel that the services provided were duplicative with PCP services.[23] Future studies incorporating these stakeholders will be important for designing an optimal THDF intervention, allowing for broader impact, and ensuring care continuity.

Furthermore, although a brief description of THDF workflows was provided to interviewees to allow for a basic mental model, not all participants may have shared a similar mental model, as some hypotheticals are involved. However, the purpose of this study was to explore HBP and caregiver perspectives on THDF and optimal implementation, so the description given before interviews was intentionally brief, leaving room for HBPs and caregivers to give input into THDF design.

As the critical cause for concern about using THDF for HBPs was the difficulty incorporating it into their workflow, it is important to explore some potential solutions for their concerns. One crucial development during the COVID-19 pandemic was improved ability to bill for telehealth services with increased reimbursement from insurance plans because of mandated payment parity for telehealth usage.[24] Ongoing payment parity could allow protected time for physicians to engage in telehealth. The required workflow changes to accommodate THDF have the potential to be dramatic if the volume is high, which would require a large shift in infrastructure and resources provided. A pilot study of the THDF intervention may help find potential solutions for these cost and logistical concerns brought forward by physicians, while also testing the utility of THDF for improving patient health and safety outcomes.

Additionally, this study used qualitative methodology to explore HBP and caregiver beliefs and develop a conceptual model, so any insight is yet to be tested. Future studies may explore further questions regarding diagnosis, case complexity, and workflow. Conducting interviews with HBPs and caregivers from other institutions to understand if our findings are consistent with their responses may help develop recommendations. It is also important to factor in the support of PCPs for HBPs to conduct THDF. We anticipate the model will ultimately inform the design and implementation of THDF, which will be subsequently studied through additional in-depth interviews and surveys of HBPs and caregivers who have completed THDF. This can

provide qualitative and quantitative data to analyze the success of the intervention to help inform future research.

CONCLUSIONS

This study highlighted the potential for implementing THDF. While HBPs shared prior workflow and technological challenges in conducting telehealth, both HBPs and caregivers thought they were comfortable with implementing THDF. HBPs and caregivers believed the benefits of the intervention outweighed the consequences. Implementing THDF could further knowledge in the field of telemedicine and improve patient outcomes. This qualitative study will help guide the implementation and evaluation of this intervention in future studies.

Acknowledgments

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