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Implementation and Outcomes of a Pediatric Hospital-to-Home Telemedicine Transition Program: A Retrospective Review (2024-2026)

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Andrea Belaza Saldarriaga [1], Ana Garcia Puebla [1], Yasmin Pedrogo Rodriguez [1], Debora S. Silva [1], Mayra Y. Vizcarrondo Lopez [1], Nerian Ortiz Matos [1]

1. Department of Pediatrics, University of Puerto Rico School of Medicine, San Juan, PRI

Corresponding author: Andrea Belaza Saldarriaga, abelaza21@stu.psm.edu

Abstract

Background

The transition from hospital to home is a vulnerable period for pediatric patients and their families. Telemedicine offers a way to stay in contact with caregivers after discharge without an additional in-person visit. We describe the implementation, use, encounter completion, and caregiver-reported experience of HoPU TelePEd, a hospitalist-led pediatric hospital-to-home telemedicine program at the University Pediatric Hospital in San Juan, Puerto Rico.

Methodology

We conducted a retrospective observational study of patients aged 0-21 years assigned a post-discharge telemedicine encounter between February 2024 and August 2026, the period covered by the program's structured data collection system. Data came from a clinic encounter log and a caregiver satisfaction survey given by telephone in 2024-2025. No electronic medical record review was performed. Attendance was classified from free-text notes using predefined criteria and summarized with descriptive statistics.

Results

The program held 56 clinic sessions, 46 with at least one patient assigned, for 154 encounters among 149 unique patients (72 in 2024, 48 in 2025, and 34 in 2026 through August 18). Overall, 92 (59.7%) encounters were completed, 41 (26.6%) could not be completed because the caregiver was not reached, and 21 (13.6%) lacked documentation to classify. Unanswered calls were the most common documented reason an encounter was not completed; incorrect phone numbers were less frequent. Completion rose from 51.4% in 2024 to 79.4% in 2026, while undocumented encounters fell from 23.6% to 2.9%. Of the 57 caregivers reached in 2024-2025, 40 (70.2%) completed the survey: 39 (97.5%) found the visit useful, and all 40 (100%) would recommend it. Structured documentation of a diagnosis and follow-up plan was available for 5 of 154 (3.2%) encounters.

Conclusions

A hospitalist-led pediatric hospital-to-home telemedicine program was feasible to implement and sustain, completing most scheduled encounters with high acceptability among surveyed caregivers. Unanswered calls were the main barrier to reach. Clinical outcomes could not be assessed with the available data; structured point-of-care documentation and linked medical record review are needed to evaluate clinical impact.

Categories: Quality Improvement, Pediatrics, Healthcare Technology
Keywords: hospital-to-home, patient's satisfaction, pediatric education, pediatric healthcare, post-discharge follow-up timing, telemedicine (tm), transition care

Introduction

Transitions from hospital to home represent a critical period in pediatric care. After discharge, patients and their caregivers may face challenges with medication management, symptom monitoring, follow-up appointments, and access to healthcare providers. These challenges may be particularly important for children with complex medical needs and families facing geographic, transportation, or healthcare access barriers [1,2]. Families of children with medical complexity have identified timely access to clinicians, clear communication, and coordinated follow-up as priorities during this transition [3], and a broad range of pediatric discharge interventions has been studied with the goal of reducing post-discharge healthcare utilization, with heterogeneous outcomes and mixed results [4,5].

In response, our institution began planning HoPU TelePEd, a hospital-to-home pediatric telemedicine encounter program, in 2019, with full implementation achieved in 2021. HoPU TelePEd was designed to

bridge the gap between hospital discharge and recommended outpatient follow-up. Encounters were prioritized for medically complex patients, for example, those discharged on multiple medications, dependent on medical equipment, or with several recommended follow-up appointments, as well as patients with limited near-term access to outpatient appointments after discharge, or those requiring follow-up on study or laboratory results that remained pending at the time of discharge. These telemedicine encounters, conducted by the pediatric hospital medicine specialist group already following each patient's inpatient care, serve as an interval encounter occurring approximately one to two weeks after discharge, ahead of other recommended outpatient appointments. To our knowledge, no comparable pediatric hospital-to-home telemedicine model has previously existed at our institution or elsewhere in Puerto Rico.

Telemedicine has emerged more broadly as a strategy to improve continuity of care by allowing healthcare professionals to evaluate and communicate with patients and caregivers remotely. In pediatric populations, telemedicine has been used to support families following hospitalization, and prior work evaluating post-discharge telemedicine pilots has demonstrated that virtual encounters are feasible and acceptable to families and may create opportunities to identify clinical concerns after patients return home [6,7]. Among children with medical complexity, telemedicine-based care has been evaluated in a randomized clinical trial [8] and through telehealth-based care team models [9], and home monitoring and post-discharge telemedicine approaches have been described for high-risk infants and children after they return home [10,11].

HoPU TelePEd has been fully implemented and active since 2021; however, we introduced a structured data collection system to systematically capture encounter-level information more recently. This study aimed to describe the implementation of the HoPU TelePEd program from February 2024 through August 2026, the period during which structured data collection has been available, including encounter completion and caregiver-reported experience.

Materials And Methods

This retrospective observational study reviewed data from the HoPU TelePEd data collection system, a structured tracking tool developed to document hospital-to-home telemedicine encounters at the University Pediatric Hospital in San Juan, Puerto Rico, covering the period from February 2024 through August 2026, the interval for which structured, systematic data collection has been available. All data were obtained exclusively from this system; no electronic medical record review was performed. This study was reviewed and approved under IRB protocol number 2608646050.

The inclusion and exclusion criteria are presented in Table *1*. In brief, eligible patients were children and young adults discharged from the University Pediatric Hospital who were referred to and assigned a HoPU TelePEd post-discharge telemedicine encounter during the study period. These criteria were designed to prioritize patients at greatest risk of gaps in care between discharge and outpatient follow-up. Patients already discharged with a clear medication schedule and established follow-up with a primary care physician or subspecialist were excluded because they were considered to have adequate continuity of care.

Criterion type	Criterion
Inclusion	Age 0 to 21 years at the time of hospitalization
Inclusion	Discharged from the University Pediatric Hospital
Inclusion	Assigned to a post-discharge HoPU TelePEd telemedicine encounter between February 2024 and August 2026
Inclusion (referral criterion)*	Medical complexity (e.g., multiple medications, dependence on medical equipment, or numerous recommended follow-up appointments)
Inclusion (referral criterion)*	Limited access to timely outpatient appointments following discharge
Inclusion (referral criterion)*	Need for follow-up of study or laboratory results pending at the time of discharge
Exclusion	Discharged with a well-documented medical schedule and established follow-up with a primary care physician or pediatric subspecialist

TABLE 1: Inclusion and exclusion criteria.

*: Patients met at least one referral criterion.

During the study period, clinics were held on designated days (the first and third Tuesday of each month, 1:00-3:00 p.m.), with a maximum of six patients per session.

Data were drawn from two sources within the HoPU TelePEd data collection system (Figure *1*). The first was a clinic-level encounter log recording the date of each session and a documented status for each encounter (attempted, completed, or unable to be completed, with accompanying free-text notes); to protect provider confidentiality, encounters are reported in aggregate as having been conducted by the pediatric hospital medicine specialist group, the same clinical team responsible for each patient's inpatient care, rather than by individual provider. The second was a caregiver satisfaction survey administered by telephone following completed encounters during 2024-2025. Calls were made by program staff after the encounter. The survey captured caregiver-reported pre-discharge orientation, timeliness of the telemedicine call, encounter duration, perceived usefulness, connection quality, and willingness to recommend the service; the full survey instrument is provided in Appendix A. This survey was discontinued after 2025 because caregivers frequently did not answer the follow-up call, did not recall the details of the encounter when reached, or provided repetitive responses that did not yield additional programmatic information. From 2026 onward, encounter-level notes recorded directly by the specialist were used in its place.

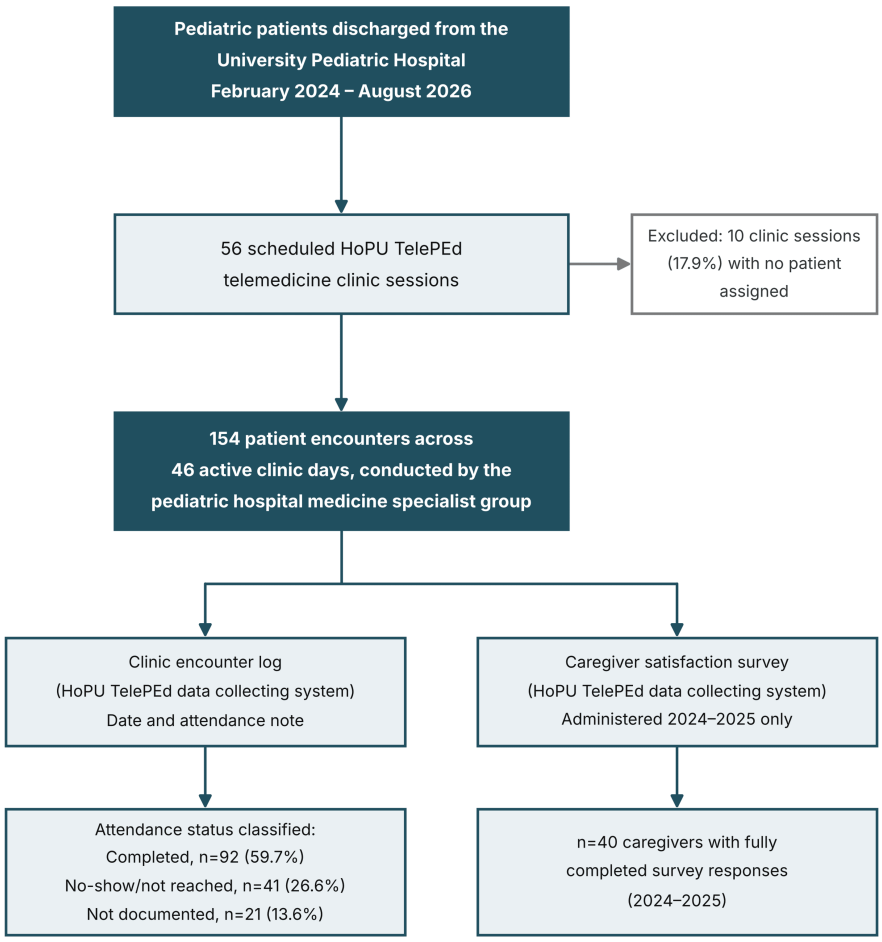


FIGURE 1: Study population and data flow diagram.

Patients discharged from the University Pediatric Hospital were scheduled across 56 HoPU TelePEd clinic sessions; 10 sessions had no patients assigned. The remaining 154 encounters, conducted by the pediatric hospital medicine specialist group, were tracked through the HoPU TelePEd data collection system's two sources: a clinic encounter log (capturing attendance status) and a caregiver satisfaction survey (n = 40 respondents).

Encounter attendance was categorized as Completed (the specialist documented that the caregiver was reached and the encounter conducted), No-show/Not reached (the caregiver could not be reached, most often due to an unanswered or incorrect telephone number), or Not documented (insufficient detail in the log to classify attendance); the full classification criteria are provided in Appendix B. Reason for encounter and clinical diagnosis were not consistently captured in the current data collection system; characterizing these variables will require a planned future review of the electronic medical record.

Descriptive statistics, i.e., frequencies and percentages for categorical variables, were used to summarize program encounters, attendance, and caregiver-reported experience. Data management and analysis were performed using Microsoft Excel and Python (pandas library). Given the descriptive, non-comparative design of this study, no inferential statistical testing was performed.

Results

Program encounters

During the study period (data available through August 18, 2026), HoPU TelePEd held 56 scheduled clinic sessions, of which 46 (82.1%) had at least one patient assigned, and 10 (17.9%) had no patients scheduled. Across the 46 active clinic days, 154 encounters were assigned: 72 in 2024, 48 in 2025, and 34 in the partial 2026 period (Figure 2). These encounters corresponded to 149 unique patients. Five patients had two encounters: four were rescheduled to the following clinic after an unsuccessful first attempt in 2024, and one followed a separate hospitalization. All encounters were conducted by the pediatric hospital medicine specialist group, the same clinical team responsible for each patient's inpatient care.

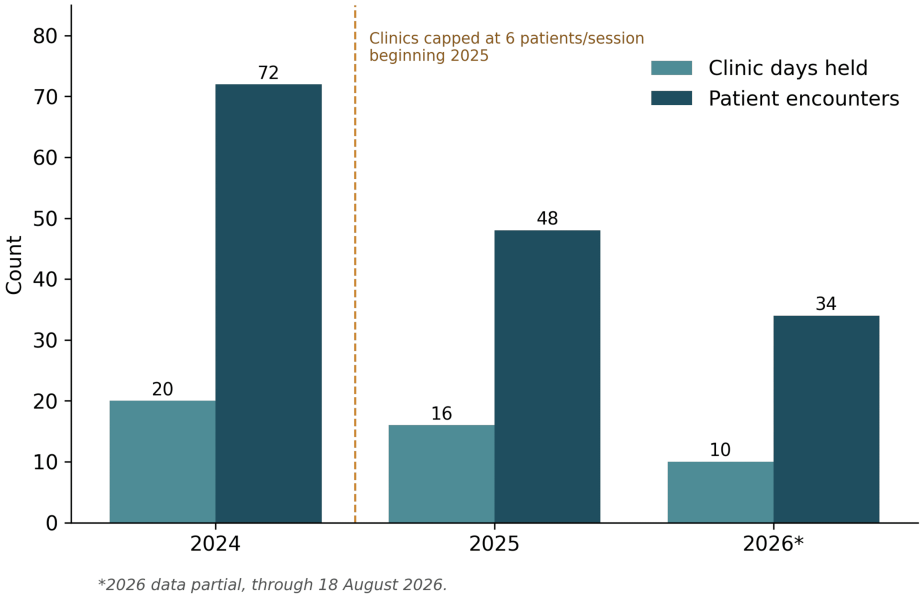


FIGURE 2: HoPU TelePEd encounters by year, 2024-2026.

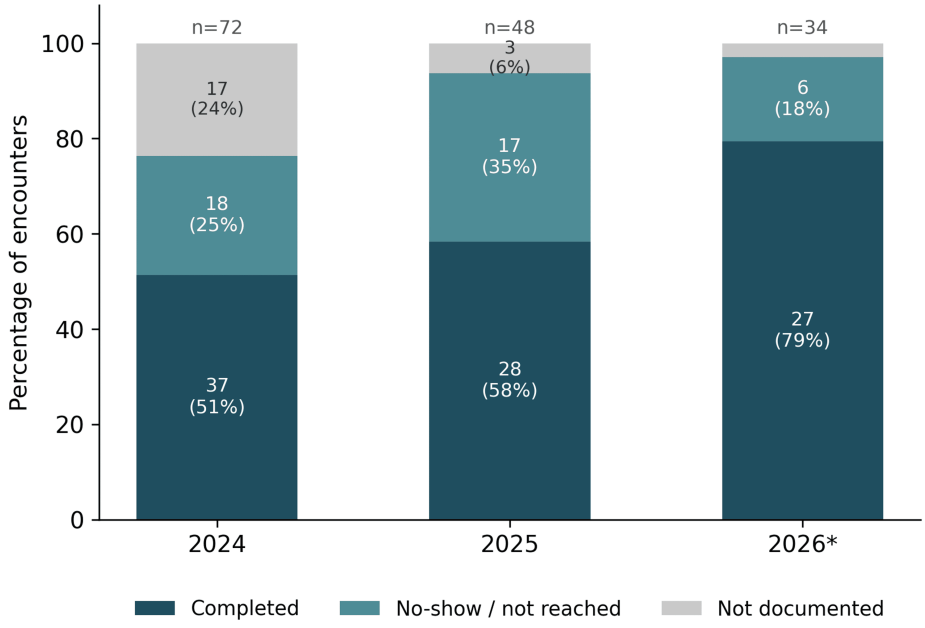
Clinic days held and patient encounters assigned by year.

*: 2026 data is partial, through August 18, 2026.

The number of encounters per year declined over the study period, mainly reflecting fewer active clinic days (20 in 2024, 16 in 2025, and 10 in the partial 2026 period). The mean number of patients per active clinic day was 3.6, 3.0, and 3.4, respectively.

Encounter attendance and completion

Of the 154 scheduled telemedicine encounters, 92 (59.7%) were successfully completed, defined as the specialist documenting that the caregiver was reached and the encounter conducted. In total, 41 (26.6%) encounters could not be completed. Among those with a documented reason, the most common was an unanswered call despite repeated attempts (n = 16), followed by encounters not called by the team (n = 6, all in 2024), caregivers reporting they did not receive the visit (n = 5), an incorrect telephone number (n = 3), and rehospitalization (n = 3). The remaining 21 (13.6%) encounters lacked sufficient documentation in the program log to classify attendance. Undocumented encounters were concentrated early in the program's history, decreasing from 17 of 72 (23.6%) encounters in 2024 to 3 of 48 (6.3%) in 2025 and 1 of 34 (2.9%) in the 2026 partial-year period, consistent with progressive improvement in documentation practices as the program matured (Figure 3).



*2026 data partial, through 18 August 2026.

FIGURE 3: Encounter attendance status by year, 2024-2026.

Percentage of scheduled encounters classified as Completed, No-show/not reached, or Not documented, by year.

Clinical documentation

Structured documentation of a clinical diagnosis and follow-up plan was available for 5 of 154 (3.2%) encounters, all from a single clinic in June 2026, when specialists began recording this information in the encounter log. Three of these patients had specialty or outpatient follow-up arranged (Cardiology, Neonatology, or Pediatrics), one had laboratory tests ordered with instructions to complete antibiotic treatment, and one was discharged on antibiotics with home care.

Caregiver-reported experience

A caregiver satisfaction survey was administered following completed encounters during 2024-2025 (see Methods). Of 57 caregivers recorded as reached during that period, 40 completed the full survey (response rate: 70.2%). Among the 40 caregivers who completed the full survey, 39 (97.5%) reported having been oriented about the virtual encounter before hospital discharge, and 38 (95.0%) reported receiving the call at the agreed date and time. Overall, 37 (92.5%) caregivers rated the encounter duration as appropriate, while 3 (7.5%) felt it was too short. Connection quality was rated favorably, with 38 of 40 (95.0%) respondents reporting no difficulty establishing the virtual connection. The encounter was perceived as useful by 39 of 40 (97.5%) caregivers, and all 40 (100%) respondents indicated they would recommend a virtual follow-up encounter to other discharged patients (Figure *4*).

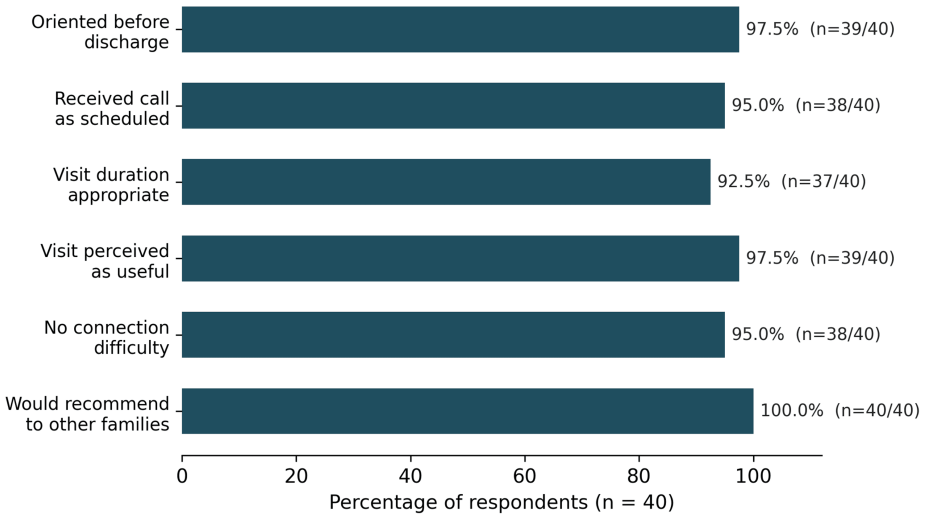


FIGURE 4: Caregiver-reported experience with the HoPU TelePEd encounter.

Percentage of caregivers reporting favorable responses across six survey domains (n = 40).

Discussion

This retrospective review describes the sustained implementation of HoPU TelePEd, a pediatric hospital-to-home telemedicine encounter program at a single institution. To our knowledge, this is the first description of such a program in pediatric care in Puerto Rico. Over the study period (February 2024 to August 2026) captured by the program's structured data collection system, HoPU TelePEd conducted 154 telemedicine encounters among 149 patients across 46 active clinic days, with nearly 60% of scheduled encounters successfully completed. This model complements other post-discharge strategies described in pediatrics, including nurse-led home visits [12], post-discharge coaching for children with medical complexity [13], and multicomponent discharge bundles [14].

The proportion of completed encounters increased over time, while undocumented encounters decreased, even as the number of encounters per year declined. The lower volume mainly reflects fewer active clinic days in later years. The rise in completion coincided with several changes: improved documentation, a fixed clinic schedule with a maximum of six patients per session, and the end of missed calls by the team after 2024. Because these changes occurred together and the study had no comparison group, the improvement cannot be attributed to any single factor.

Among caregivers who completed the satisfaction survey, feedback was overwhelmingly favorable: nearly all felt adequately oriented to the virtual encounter process, connection difficulties were uncommon, and all respondents indicated they would recommend the service to other families. These findings support prior literature indicating that telemedicine follow-up is both feasible and acceptable to pediatric caregivers after hospital discharge [6,7], and are consistent with broader evidence that telehealth can help address access barriers for geographically or socioeconomically disadvantaged families [2]. However, caregivers who did not respond to the survey (30%) may have had less favorable experiences.

The most common barrier to completing an encounter was an unanswered call, despite repeated attempts. Incorrect telephone numbers were less frequent. This finding echoes provider-reported concerns about the fragility of care transitions when communication channels are not actively maintained between discharge and follow-up [1]. Similar challenges have been reported for post-discharge telephone outreach: a multisite study found that post-discharge contact frequently identified clinical and service issues after pediatric hospitalization [15], and a separate multisite analysis found that the likelihood of attempting and connecting post-discharge calls varied across sites and patient characteristics [16]. Simple, low-cost steps may improve reach: confirming the best number and time to call before discharge, recording an alternate contact, sending a reminder before the visit, and scheduling a second attempt on another day.

This study has several important limitations. First, given its retrospective design, encounter-level detail was often missing or incompletely documented, and documentation practices varied over the study period. Reason for encounter, clinical diagnosis, patient demographics, and comorbidities were not systematically captured within the current data collection system, and structured clinical documentation was available for only 3.2% of encounters. Characterizing these variables will require a planned future review of the electronic medical record. Second, the caregiver satisfaction survey, the primary source of program experience data for

2024-2025, was discontinued in 2026 after caregivers frequently did not answer, did not recall the encounter, or gave repetitive responses; this limits comparability of caregiver-reported outcomes across the full study period, and nonresponse may have biased results toward favorable responses. Third, this is a single-center study without a comparison group, so causal relationships between program participation and downstream outcomes such as emergency department utilization or hospital readmission cannot be established. Patients were referred by the inpatient team according to the program criteria, which may introduce selection bias, and the 2026 data cover only part of the year. Finally, because attendance was extracted from free-text notes rather than a structured field, its classification required an investigator-applied rule (Appendix B) rather than a validated instrument, which may introduce misclassification.

Future evaluation of HoPU TelePEd would benefit from structured, point-of-care documentation of clinical variables at the time of each encounter, supplemented by focused electronic medical record review to capture patient characteristics, reason for encounter, and subsequent healthcare utilization. Prospective tracking of emergency department visits and readmissions linked to telemedicine encounters would also allow future analyses to move beyond program encounters and caregiver experience toward an assessment of clinical impact.

Conclusions

HoPU TelePEd, a hospitalist-led pediatric hospital-to-home telemedicine program, was feasible to implement and sustain at our institution. Most scheduled encounters were completed, and caregivers who responded to the survey reported high satisfaction and acceptability. The proportion of completed encounters increased over the study period as documentation practices improved and clinics moved to a fixed schedule. Because of the retrospective design, the absence of a comparison group, and the partial 2026 data, this trend cannot be attributed to any single change. The most common barrier to completing an encounter was an unanswered call. Confirming the best number and time to call before discharge, sending reminders, and allowing a second attempt on another day are simple steps that may improve reach. These findings describe program operations and caregiver experience, not clinical effectiveness. Clinical data were documented for only a small proportion of encounters, and patient characteristics were not captured. Future evaluation should add structured point-of-care documentation, medical record review, and prospective tracking of emergency department visits and readmissions.

Appendices

Appendix A. Caregiver satisfaction survey instrument

The following questions were administered by telephone to caregivers following completed telemedicine encounters during 2024-2025:

1. Before being discharged from the hospital, were you oriented about the virtual follow-up visit? (Yes/No)

2. Did you receive orientation about the purpose of the telemedicine visit with the hospitalist pediatrician? (Yes/No)

3. Were you given a document with the date and time of the appointment, or were you notified by phone call or text message? (Yes/No)

4. Did you receive the call for the virtual visit at the agreed date and time? (Yes/No)

5. Regarding the duration of the virtual encounter, do you feel it was: (Appropriate/Too short)

6. Do you feel the virtual follow-up visit was: (Very useful/Not very useful)

7. Regarding the connection for the appointment: (No difficulty establishing the connection/Difficulty with internet connection)

8. Would you recommend a virtual follow-up visit to other patients being discharged from the hospital? (Yes/No)

Appendix B. Criteria used to classify telemedicine encounter attendance status

Encounter-level notes in the program log were classified into one of three categories based on the following criteria:

Completed: The attending pediatrician's note indicated the caregiver was reached and the encounter was conducted (e.g., documented evaluation, completed survey, or a recorded clinical assessment/follow-up plan).

No-show/Not reached: The note indicated the caregiver could not be reached despite attempted contact, most commonly due to an unanswered call or an incorrect/disconnected telephone number.

Not documented: The note field was blank or did not contain sufficient information to determine whether the encounter occurred.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Andrea Belaza Saldarriaga, Nerian Ortiz Matos

Acquisition, analysis, or interpretation of data: Andrea Belaza Saldarriaga, Nerian Ortiz Matos, Ana Garcia Puebla, Mayra Y. Vizcarrondo Lopez, Yasmin Pedrogo Rodriguez, Debora S. Silva

Drafting of the manuscript: Andrea Belaza Saldarriaga

Critical review of the manuscript for important intellectual content: Andrea Belaza Saldarriaga, Nerian Ortiz Matos, Ana Garcia Puebla, Mayra Y. Vizcarrondo Lopez, Yasmin Pedrogo Rodriguez, Debora S. Silva

Supervision: Nerian Ortiz Matos

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. The University of Puerto Rico, Medical Sciences Campus Institutional Review Board issued approval 2608646050. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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