

Implementing Team-Based Telemedicine Workflows in Safety-Net Primary Care

Marianna Kong, MD; Rachel Willard-Grace, MPH; Elaine Khoong, MD, MS; Anjana Sharma, MD; Monjori Mukerjee, BSc; George Su, MD; and Delphine Tuot, MD

The COVID-19 pandemic spurred health care systems to rapidly transform telemedicine from an uncommon innovation in most outpatient settings to a fundamental modality of care.¹⁻³ Prior to reimbursement changes during the pandemic, using telemedicine to deliver synchronous care via video and audio visits was especially rare among safety-net clinics providing primary care to low-resource populations.⁴⁻⁶ The challenges of telemedicine implementation disproportionately affect safety-net institutions and their patients. Patients who identify as part of racial/ethnic minority groups, have limited English proficiency, or have lower socioeconomic status face increased barriers to accessing telemedicine, including lower device, internet, and data access and limitations in digital literacy.⁷⁻¹⁵ The “digital divide” between those with and without resources to access technology-based health innovations affects many of the same populations already affected by health inequities.¹⁶⁻¹⁹ Thus, the medical community has highlighted the importance of addressing equity in telemedicine access to help reduce existing disparities in health care delivery and outcomes, rather than exacerbate them.^{20,21}

With primary care’s foundational role in improving population health and narrowing health disparities,^{22,23} understanding telemedicine implementation in safety-net primary care settings is particularly relevant.²⁴ Studies typically depict patient or clinician perspectives on general benefits and challenges of telemedicine or patterns of utilization,^{7,25-37} but they have yet to detail specific workflow characteristics that support implementation and sustainability, especially within the context of primary care teams.

Team-based care adapts roles and workflows for the optimal contribution of nonphysician team members,³⁸ and there is a need to understand how best to incorporate primary care team members into telemedicine workflows. Although one study outlines examples of adapting team-based care to telemedicine,³⁹ it is based in a practice setting with resources for advanced team-based care. Given the resource constraints for practices serving a safety-net population with limited digital literacy, specific research is needed around how to operationalize team-based telemedicine in safety-net settings. Furthermore, prior studies have focused on clinicians or

ABSTRACT

OBJECTIVES: Challenges in implementing telemedicine disproportionately affect patients served in safety-net settings. Few studies have elucidated pragmatic, team-based strategies for successful telemedicine implementation in primary care, especially with a safety-net population.

STUDY DESIGN: We conducted in-depth, semistructured qualitative interviews with primary care clinicians and staff in a large urban safety-net health care system on the facilitators, challenges, and impact of implementing team workflows for synchronous telemedicine video and audio-only visits.

METHODS: Interviews were analyzed using modified grounded theory with multistage coding. Common themes were identified and reviewed to describe within-group and between-group variations. We used the Practical, Robust Implementation Sustainability Model framework to organize the final themes with an implementation science lens.

RESULTS: Four themes emerged from 11 interviews: (1) having a dedicated individual preparing patients for video visits is a prerequisite for the successful introduction of video visits to patients with limited digital literacy; (2) health care maintenance during video and audio-only visits benefits from standardized workflows and communication; (3) the increased flexibility and accessibility of telemedicine visits were perceived benefits to patient care, despite barriers for subsets of patients; and (4) telemedicine visits generally have a positive impact on work experience for clinicians and staff due to increased efficiency, despite audio-only visits feeling less engaging.

CONCLUSIONS: Understanding how to strategically use team-based workflows to expand video visit access while ensuring care quality of all telemedicine visits will allow primary care practices to maximize telemedicine’s benefits to patients in the safety-net setting.

Am J Manag Care. 2024;30(Spec Issue No. 6):SP437-SP444.
doi:10.37765/ajmc.2024.89550

TAKEAWAY POINTS

Clinicians and staff in safety-net primary care clinics recognized that team-based workflows can help expand video visit access and improve health care maintenance in telemedicine visits.

- ▶ Dedicated staff providing navigation support for video visits are necessary for safety-net populations to access these visits.
- ▶ Workflows to consistently and equitably offer video visit options to patients are also needed.
- ▶ Standardized team-based workflows and communication facilitate health care maintenance in telemedicine visits.
- ▶ Ensuring high-quality preventive and chronic care during both phone and video visits will be important as patients continue to face barriers to video visit access.

system leaders^{26,29-32} despite the importance of staff perspectives in primary care teams.

To bridge these gaps and better elucidate pragmatic, team-based strategies for implementation of video and audio visits in safety-net primary care, we assessed clinician and staff perspectives on the facilitators, challenges, and impact of implementing team-based telemedicine workflows.

METHODS

Setting/Population

This study was conducted in a large urban clinic network serving an ethnically diverse, publicly insured patient population, with a large proportion of patients primarily speaking non-English languages. In this network of 14 primary care clinics, telemedicine visits (defined as synchronous video or phone visits with a clinician) were not routinely offered prior to the COVID-19 pandemic.

The 3 sites serving as the study setting included 2 community-based family medicine clinics and 1 internal medicine residency clinic. These sites were selected due to their piloting of 2 team-based telemedicine workflows. One workflow supported video visits through a “support pool” to which clinicians and staff could refer patients needing video visit orientation. The support pool consisted of volunteers who called patients ahead of visits to guide them through the process of starting a video visit. The other workflow incorporated health care maintenance (preventive and chronic care tasks) into video and audio-only telemedicine visits by using standardized “virtual rooming,” where medical assistants called patients to coordinate health care maintenance tasks before telemedicine visits. Workflow details are provided in **eAppendices A and B** (eAppendices available at ajmc.com).

During the study period, audio-only visits represented 31.5% of all primary care visits in the network and 35.6% of visits at the 3 pilot sites. Video visit prevalence was 0.4% (796 visits) in the network and 0.8% (196 visits) in the pilot sites.

Study Design

We performed in-depth qualitative interviews with clinicians and staff at the 3 clinics. Participants were recruited using a purposive sampling strategy, in which clinics identified clinicians, medical

assistants, and managers with firsthand experience implementing the telemedicine workflows. Researchers invited eligible participants via email to take part in a Zoom interview, and both clinician and staff interviewees were included from each site. The interview instrument (**eAppendix C**) was designed using stakeholder input. Verbal consent was obtained at the time of the interview.

One-on-one semistructured interviews were conducted between October 2021 and April 2022, until the research team observed no new concepts

arising from interviews, suggesting thematic saturation.⁴⁰ Interviews were audio recorded, deidentified, and transcribed verbatim using autotranscription followed by review by the interviewer for accuracy. The study protocol was approved by the University of California, San Francisco Institutional Review Board (study # 11-08048).

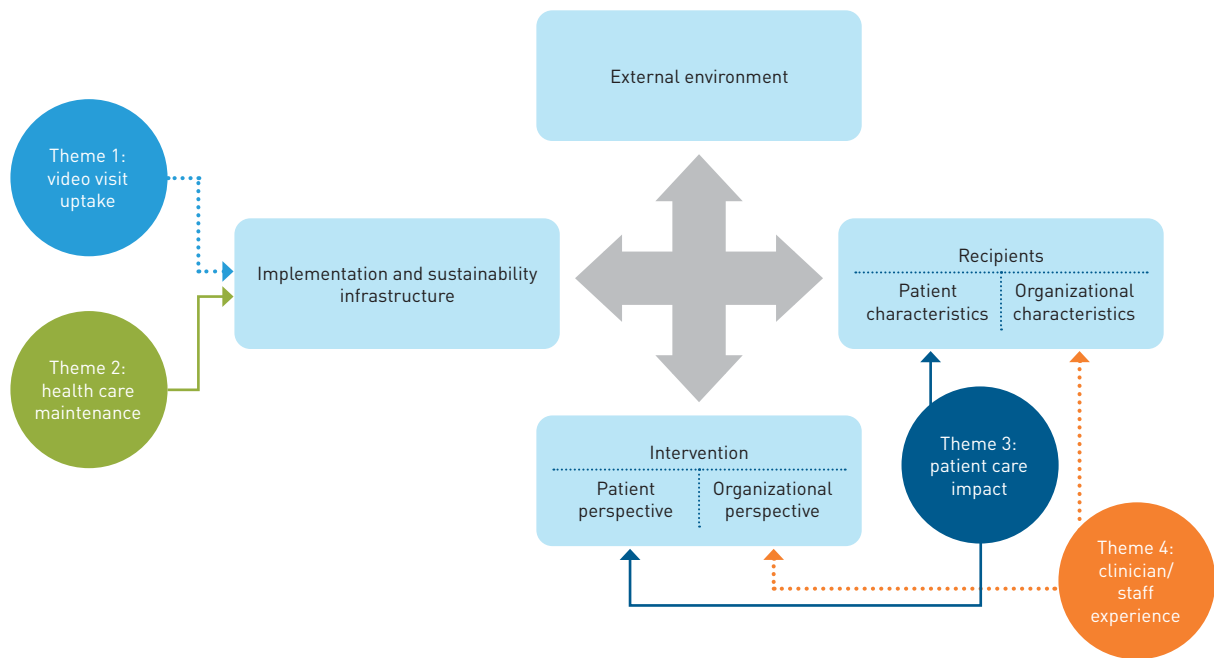
Analysis

Coding and thematic development were conducted in an iterative process. Interviews were dual-coded by the interviewer and a trained research associate using modified grounded theory with multistage coding.⁴¹ The analysis team reviewed a sample of 3 transcripts to identify recurrent ideas and organize them into a codebook, which was piloted and refined with additional transcripts. To calibrate between coders, team members independently coded a subset of 4 transcripts, then met to identify and resolve discrepancies. They then used the codebook to code each transcript and met weekly to review and discuss coding decisions until a consensus was reached. An additional transcript was dual-coded and reconciled later in the coding process to avoid drift in intercoder consistency. Dual-coded interviews were entered into Atlas.ti version 9.1.7.0 (Atlas.ti Scientific Software Development, GmbH). Common themes were identified and reviewed to describe within-group and between-group variations. Final themes were selected based on prevalence among interviewees and relevance for implementing telemedicine workflows.

To organize the final themes with an implementation science lens, we used the Practical, Robust Implementation Sustainability Model (PRISM) framework, which describes multilevel contextual factors relevant to program implementation.⁴²⁻⁴⁴ The PRISM framework evaluates how health care interventions interact with the external environment, intervention design, implementation and sustainability infrastructure, and the multilevel recipients of an intervention.⁴²⁻⁴⁴

RESULTS

Of 19 individuals across the 3 clinics invited to take part in this study, 11 participated, for a response rate of 57.9%. These included 4 primary care clinicians, 5 medical assistants, 1 nursing manager, and 1 practice manager. At least 1 clinician and 1 medical assistant from each clinic were interviewed. Participants had worked at their sites for a mean of 5 years, ranging from 7 months to 10 years.

FIGURE. Thematic Areas Mapped to the Practical, Robust Implementation Sustainability Model⁴²⁻⁴⁴

Four themes emerged, corresponding to the impact of telemedicine workflow implementation on video visit uptake, health care maintenance, patient care, and clinician/staff experience, with the latter 3 themes pertinent to both audio and video visits. Within the PRISM framework, the first 2 themes corresponded to the implementation and sustainability infrastructure domain, whereas the latter 2 mapped to the patient and organizational perspectives and characteristics (Figure⁴²⁻⁴⁴). Representative quotes are summarized in the Table.⁴²⁻⁴⁴ Nonclinicians are referred to as “staff” for simplicity.

Theme 1: Having a Dedicated Individual Preparing Patients for Video Visits Is a Prerequisite for the Successful Introduction of Video Visits to Patients With Limited Digital Literacy

Seven of 11 interviewees reported that having a dedicated staff role to orient patients with limited digital literacy to using video visits was essential. They described that the amount of time needed to help patients through the process became unfeasible for current staff to balance with existing duties.

Five of 11 interviewees described the video visit support pool as a helpful resource for supporting patients to use video visits. Two staff noted this was limited by whether the patients were contacted in time for their video visits. Five of 11 interviewees observed barriers at the upstream stage of offering video visits to patients.

Theme 2: Health Care Maintenance for Telemedicine Visits Benefited From Standardized Workflows and Communication for Medical Assistant Virtual Rooming

All interviewees from the community-based sites (3 clinicians and 4 staff) reported that the virtual rooming workflows improved health care maintenance quality for telemedicine visits. Four interviewees said that by using the workflows, the perceived difference between in-person and telemedicine preventive care was small or negligible. Among the community-based clinics, 2 clinicians and 2 staff members commented that having standardized workflows facilitated consistent completion of health care maintenance tasks for telemedicine visits.

In contrast, interviewees from the teaching clinic site reported more challenges with consistency of the workflows, with variability in how often preventive care was completed for telemedicine visits. Seven of 11 interviewees from all 3 clinics described medical assistant staffing shortages or turnover as a barrier to successfully implementing standardized preventive care workflows for telemedicine visits.

Seven of 11 interviewees reported logistical barriers to completing health care maintenance tasks during telemedicine visits compared with in-person visits. These included patients needing to be scheduled to return for in-person preventive care tasks (eg, vaccines or cervical cancer screening) and perceived decreased priority of

TABLE. Representative Quotes by Theme⁴²⁻⁴⁴

Subtheme (interviewees reporting)	Representative quotes ^a
<p>Theme 1: Having a dedicated individual preparing patients for video visits is a prerequisite for the successful introduction of video visits to patients with limited digital literacy. <i>PRISM domain: implementation and sustainability infrastructure</i></p>	
<p>A dedicated staff role to orient patients to using video visits was essential. (4/4 clinicians, 3/7 staff)</p>	<p>"At the beginning, MAs were going the extra mile trying to help the patients get into Zoom and telling them how to do it. But it took too long, like over 20 minutes trying to go back and forth and explain over the phone, which was not doable, because the provider gets behind, patients get frustrated, the MAs get frustrated.... They don't have time to assist them because they're also seeing the patients [who] are in person. So that has not worked." (staff)</p> <p>"I think clinicians are really looking for that support. They cannot take on the [video visit] operations. It needs to be shared across the team and what we really realized is we don't have the workforce for this. Our team of medical assistants, front desk staff, PCP, [and] nurses is beyond saturated and beyond capacity, and it really felt difficult to ask them to absorb new workflows and new operations around [video visits].... We need a workforce that specifically can manage [video workflows], has the skills for it, and has the capacity for it...anything that outsources some of the support that patients need." (clinician)</p>
<p>The video visit support workflow was a helpful resource for supporting patients to use video visits. (2/4 clinicians, 3/7 staff)</p>	<p>"I've had several experiences offering the [video visit] support.... I believe the pool is very helpful to help the patient set up." (staff)</p> <p>"All you have to do is just connect them to Zoom. And give the iPad to the provider, nothing else. You don't have to call in advance, you don't have to set them up,...we have [the video visit support] pool for that." (staff)</p>
<p>Insufficient offering of video visits was a barrier to implementing video visits. (3/4 clinicians, 2/7 staff)</p>	<p>"We've seen a couple people try video visits...where occasionally there's a patient who's really good on video or asks for it, or clinician who asks for it...[but] we have not seen it integrated into regular, scheduled visits.... We've seen very little uptake." (clinician)</p> <p>"There really hasn't been all that much buy-in, which is something we're working on, like, basically other staff hasn't started booking video visits. So right now we're working on ramping up...we haven't done enough to think about [offering them regularly]." (clinician)</p>
<p>Theme 2: Health care maintenance for telemedicine visits benefited from standardized workflows and communication for MA virtual rooming. <i>PRISM domain: implementation and sustainability infrastructure</i></p>	
<p>Virtual rooming workflows allowed close approximation of health care maintenance quality during telemedicine visits. (3/4 clinicians, 4/7 staff)</p>	<p>"[With the workflow] we can standardize patient care, we know how to offer patients the next step.... Patients can get more care with the workflow. [Without it], we [might] skip some steps...[but with it] we can make sure we can help patients to update all the health maintenance.... [The quality is] almost the same." (staff)</p> <p>"Something like a Pap [smear] I think definitely gets done more in person. But for mammo[grams] and [colon cancer screening]...and the diabetic eye stuff as well, those are done I think at almost the same rate." (clinician)</p>
<p>Clear workflows and communication were helpful with successful implementation. (2/4 clinicians, 2/7 staff)</p>	<p>"Writing things down as a workflow helps because it helps make it clear about what the job expectation is.... Having an algorithmic workflow about what was supposed to get documented where, that was helpful and the provider working on this got a lot of feedback so that helped get buy-in from the medical assistant team. I think the time where I saw it [improve] was when the provider and the MA teams met about it a couple of times, so [we] heard from each side about what was working and not working, and why some of these things were important, and acknowledging where some of the difficulties were and trying to work around them, that's where I feel the consistency was happening the most." (clinician)</p> <p>"We had to have meetings about [trying to all] do it the same...monthly meetings with the MAs and providers discussing how they can work together better. Because we still have challenges where even though the MA needs to call the patients ahead of time...they get caught up in discharges or preparing rooms and they don't have time to call the patient ahead of the provider. So those have been challenges, so they have to work it [out] between the MA and the provider." (staff)</p>
<p>Staff shortages/turnover were a barrier to successful implementation. (3/4 clinicians, 4/7 staff)</p>	<p>"We also have seen a lot of staff turnover during this time, so you know there [are] some MAs [who] are really comfortable and there [are] others [who] are still learning the workflows of the clinic. We've had newer MAs [who] are filling in or [whom] we're borrowing from other clinics. So I think staffing challenges have played a role in why this continues to be variable.... Due to ongoing staffing challenges, our MAs currently don't have administrative time, which is when they would usually do these sorts of calls." (clinician)</p> <p>"I think most clinics are going through the issue of lack of staffing. So they are more than happy to just punt [new telehealth workflows] down, if they're going to prioritize." (staff)</p>
<p>Logistical barriers to health care maintenance existed for telemedicine visits compared with in-person visits. (4/4 clinicians, 3/7 staff)</p>	<p>"I think most of the workflows are helpful to have the patient keep up their health maintenance, except [if they have to] reschedule [to come in to complete it]...they might forget the appointment, or no-show.... Like once it's been scheduled, it's dependent on the patient to come.... But if they're in person, of course we can offer them everything to be completed on the same day." (staff)</p> <p>"I think for the most part the medical assistants do call and do the virtual rooming...but it does sometimes get missed, if they're doing something like a blood draw or [giving] shots...just because sometimes the in-person things get precedence... Some of the things that we do, I would say in general, the in-person is done slightly more consistently...a lot of the time it's because of the [flow], where the [MA] doesn't get to it." (clinician)</p>

(continued)

TABLE. (Continued) Representative Quotes by Theme⁴²⁻⁴⁴

Subtheme (interviewees reporting)	Representative quotes ^a
<p>Theme 3: The increased flexibility and accessibility of telemedicine visits were perceived benefits to patient care, despite barriers for subsets of patients.</p> <p><i>PRISM domains: intervention—patient perspective, and recipient—patient characteristics</i></p>	
<p>Telemedicine options provided increased flexibility and accessibility to patients. (4/4 clinicians, 7/7 staff)</p>	<p>"I think it's really been great to be able to offer this flexibility; I think before, it...[would] take a long time to schedule in person, and patients would have to take time or have someone watch their children, or if they're caretakers for older adults...it was another barrier [to] coming in. And a blood pressure visit could be very, very simple, but then having the requirement to have them come in and find parking, that would definitely make it sort of a clunky, slow process, whereas right now it feels like we're able to respond in many cases better to our patients' needs.... It doesn't seem like it's burdensome for them, so I feel like I'm able to offer more options [in] our flexibility and following up with people's care." (clinician)</p> <p>"I feel like it's really cool to give them different options.... [Some patients] are like, 'I really can't take off a day,' but they would be able to do a phone call at their break time or lunchtime.... They don't have to struggle so much coming here. And, you know, things happen along the way, and instead of rescheduling an appointment, they can just talk over the phone." (staff)</p>
<p>Some patient subgroups have more barriers to telemedicine, including older patients or those with limited digital literacy. (3/4 clinicians, 7/7 staff)</p>	<p>"The older patients will not be able to log in or have a computer, or they don't know how to use their phones, or they don't have smartphones.... We do have a lot of patients [who] are really hard to get a hold of on the phone. They work, so they don't answer, or they change their numbers often, or if they don't change it, sometimes they're not using them.... Some of them don't even have their voicemail set up, so it's hard to even leave them a message." (staff)</p>
<p>Telemedicine was a more efficient format for care in certain scenarios. (3/4 clinicians, 2/7 staff)</p>	<p>"There [have] been a few instances where I was involved in setting up a video visit that was perfect...orthotics- or prosthetic-related, [DME]-related visits, where technically they have to be quote unquote seen, but they're just checking in on this DME order.... I've seen that done a few times through video, and that works great." (staff)</p> <p>"A lot of people would get blood work and then we'd [say], 'Oh, we'll just call you if anything's abnormal.' Then they would call in and ask to talk to the [advice line], and that was a lot of extra phone calls or extra work.... Now...we can say, 'OK, we're going to schedule a telephone call to go over your results in a week or 2,' [and] patients seem to really like that." (clinician)</p>
<p>Improved protocols to appropriately triage among visit formats are needed. (2/4 clinicians, 1/7 staff)</p>	<p>"I think we did a lot of phone visits where it was clear that the person needed to come in for an urgent medical reason... for example, something like...a red eye or something that just was virtually impossible to evaluate by phone." (clinician)</p> <p>"What's working is the doctors kind of seeing if that patient really needs to come in and kind of triaging what the next appointment would be. Is it really necessary to have them come in, or can we do this over the phone?" (staff)</p>

(continued)

virtual rooming workflows when medical assistants were busy with in-person patient tasks.

Theme 3: Increased Flexibility and Accessibility of Telemedicine Visits Were Perceived Benefits to Patient Care, Despite Barriers for Subsets of Patients

All 11 interviewees observed increased visit flexibility and accessibility as key patient care benefits of having telemedicine options, especially for younger patients, patients less able to take time off from work or caregiving responsibilities, and those with mobility difficulties. Many staff members and clinicians specifically noted the benefits of being able to switch from in-person to a telemedicine visit when last-minute circumstances otherwise would have led to a no-show or cancellation. However, 10 of 11 interviewees also noted patient subgroups with more barriers to telemedicine, including older patients and patients with low digital literacy.

Four of 11 interviewees also observed that telemedicine visits seemed to be more useful than in-person visits for care delivery in

certain scenarios. For example, 2 of 4 clinicians described telemedicine as a good format for discussion of results with patients, when previously this might be done only at a patient's proactive request, and a staff member described telemedicine as a good format for ordering durable medical equipment.

Three of 11 interviewees also identified the need to improve protocols to identify the most appropriate visit format. Two of 4 clinicians raised concerns about delays when an issue is attempted to be addressed over telemedicine but actually requires an in-person evaluation.

Theme 4: Telemedicine Visits Generally Have a Positive Impact on Work Experience for Clinicians and Staff Due to Increased Efficiency, Despite Audio-Only Visits Feeling Less Engaging

Ten of 11 interviewees described telemedicine visits as bringing more efficiency into the clinic schedule and flow. Four of 7 staff specifically described the flexible timing of telemedicine visits as

TABLE. (Continued) Representative Quotes by Theme⁴²⁻⁴⁴

Subtheme (interviewees reporting)	Representative quotes ^a
<p>Theme 4: Telemedicine visits generally have a positive impact on work experience for clinicians and staff due to increased efficiency, despite audio-only visits feeling less engaging.</p> <p><i>PRISM domain: intervention—organizational perspective, and recipient—organizational characteristics</i></p>	
<p>Telemedicine brings increased flexibility or efficiency in clinic flow. (4/4 clinicians, 6/7 staff)</p>	<p>"For telephone or video, we don't need to wait until the patient arrives; we can call ahead of the appointment.... But if all the patients are in clinic, we have to wait until the patient arrives, then we can start, or we need to find an exam room. Now the time management is much easier or less stressful for the MA." (staff)</p> <p>"I feel like telehealth has definitely made work less exhausting. I think because telehealth visits, for the most part, feel like there are clearer limits and boundaries on what you can do.... Fewer additional agenda items get added on the telehealth visits, so it does make visits seem to go more efficiently and quickly. And that, overall, is helpful for my day." (clinician)</p> <p>"The doctor can always do a phone call while you're still waiting for patients to come in. Sometimes you have patients [who] run late to their appointment. And the doctor has a phone call, so she can always call that patient as she's waiting for that in-person to come in. So it's more flexibility." (staff)</p>
<p>Involving MAs in health care maintenance for telemedicine visits is helpful to reduce burnout. (3/4 clinicians)</p>	<p>"Now that the MAs are doing [these workflows], it doesn't make me feel like the entire [telemedicine] visit is on me, when there's [an MA] involved in doing a component of that.... Initially in the pandemic, it felt like those visits were actually all on the provider, and that was hard because you're both trying to do a visit and do the [MA] part." (clinician)</p>
<p>Audio-only visits feel less engaging. (2/4 clinicians, 2/7 staff)</p>	<p>"When I have telehealth-only days...I end the day with my charts finished generally, and I don't have as many things hanging over me after the clinic is done; that makes me feel less burnout.... But there's also a part of me, after I'm done with the phone visits...where I just don't find it as rewarding. Like if I have a phone-only half day, it's great, I'll be done earlier, but I don't feel like I've connected with patients in the same way, and I don't feel like I've helped in the same way.... I think probably the video component would add back some of that." (clinician)</p> <p>"[Telehealth] definitely fosters a relationship between the provider and the patient, which is always nice. But it disconnects the rest of the team.... They're different when they're in person vs when they're not. When they're in person, they engage in all the stuff, ask all the questions, go through the vitals—[it's] much more structured and engaged." (staff)</p> <p>"I found it really, really challenging to take care of complicated patients without ever meeting them in person. And I found it really, really difficult to build rapport with them and build trust with them...only over the phone. In the times that I did use video visits, I really liked it and I felt like just making a face-to-face connection was so helpful. There was just something—maybe cognitively for me as a clinician—that when I could put a face and a voice to a patient, I could remember them and understand them so much better." (clinician)</p>

DME, durable medical equipment; MA, medical assistant; PCP, primary care provider; PRISM, Practical, Robust Implementation Sustainability Model.⁴²⁻⁴⁴

^aFor the purposes of the interviews, the terms *telehealth* and *telemedicine* were used interchangeably to refer to synchronous phone/video visits. Quotes were edited for length or clarity but not content.

helpful for their time management. Three of 4 clinicians reported that telemedicine visits had a positive impact on burnout or work exhaustion due to these benefits. The 3 clinicians from the community-based sites described the involvement of medical assistants in health care maintenance for telemedicine visits as helpful for reducing burnout.

Two of 4 clinicians and 2 of 7 staff also commented that phone visits had less sense of connection or relationship compared with in-person visits. The clinicians reported that this resulted in less joy in practice, but also that video visits could be more rewarding than audio-only visits.

DISCUSSION

We identified key facilitators and barriers with clinician and staff agreement around the strategic incorporation of 2 telemedicine workflows in busy, underresourced safety-net primary care clinics. Pertinent to the implementation and sustainability infrastructure

domain of PRISM, we found that optimizing telemedicine in public delivery systems requires dedicated support staff to orient patients to video visits. This would require hiring additional staff or offloading other responsibilities from existing staff to create team-based capacity for telemedicine orientation. A few prior studies have called for devoting resources to providing digital navigators to overcome video visit barriers,^{35,45-47} and this study provides supporting evidence for this need, especially in settings where limited digital literacy is more common among patients. After a critical threshold of patients receive video visit teaching and lower volumes of patients need ongoing teaching, digital navigation may be more easily integrated into existing staff roles sustainably. However in settings with large proportions of patients with limited digital literacy, a significant up-front investment in digital navigation will be necessary.

Our findings also suggest dedicated navigation support is necessary but insufficient without additional workflows to consistently offer video visit options to patients. There has been evidence of lower

rates of offering video options to certain populations (eg, Hispanic, non–primary English speaking, and Medicaid/Medicare dually eligible patients) even after controlling for access to a smartphone/tablet and home internet.⁵ This is consistent with literature on disparities in offering other technological health innovations, such as patient portals.⁴⁸ Thus, further development and evaluation of workflows to ensure standardized offering of video visit options and support will be an important step in operationalizing video visits effectively and equitably.²⁰

Consistent use of team-based workflows was an important contributor to providing health care maintenance during video and audio visits. One study in a large integrated health system found that patients with telemedicine exposure had better rates of chronic disease and counseling-based preventive care metrics,⁴⁹ suggesting that these components of primary care can translate effectively to telemedicine formats. Additionally, this study showed that a team-based virtual rooming workflow can be successfully applied to health care maintenance in the safety-net setting. Interviewees from the community-based sites that reported higher consistency of these workflows noted that clear role expectations and opportunities for team communication facilitated successful implementation, which should be built into future telemedicine workflow initiatives. Clinicians from these sites also described that the health care maintenance workflows helped reduce exhaustion or burnout, further supporting the value of investment in team-based telemedicine workflows.

In the patient and organizational domains of PRISM, our findings aligned with those previously reported in non–safety-net settings,^{28–30,33–36} with flexibility, accessibility, and efficiency being major benefits of telemedicine visits despite certain limitations and barriers. For safety-net populations in which patients commonly face increased structural barriers to accessing in-person health care, such as transportation issues or limited ability to take time off from work, the flexibility of telemedicine options may provide particularly important accessibility benefits. For example, the ability to convert in-person visits to telemedicine visits provided patients more flexibility for in-person visits that could have become no-shows. No-show rates of scheduled telemedicine visits themselves did not emerge strongly in our interviews but would be important to explore in future studies. Interviewee descriptions of using telemedicine effectively in certain situations and for efficient clinic flow support further development of best practices for strategically triaging telemedicine visit formats to best meet patients' clinical and accessibility needs.

Limitations

Limitations of this study include that staff and clinician experiences were more representative of audio-only visits. Further perspectives obtained with scaled-up video visit volumes could offer additional insights into impacts of telemedicine on care delivery, for example, whether video visits would ameliorate the reduction in clinicians' perceived rapport and engagement during audio-only visits. Another limitation is the small sample size, although our patient

and organizational perspective findings corroborated those of prior studies, supporting our assessment of thematic saturation.

This work highlights the importance of designating and funding specific staff to provide telemedicine support for video visits as well as sufficient staffing to consistently implement health care maintenance workflows to improve quality of care in telemedicine visits. Equitably supporting patients to engage in video visits while simultaneously ensuring high-quality preventive and chronic care during both phone and video visits will be important as patients continue to face barriers to video visit access and decisions evolve around reimbursement for audio vs video visit types.^{13,50} Further research should examine optimal workflows for consistently and equitably offering video visits to patients in safety-net settings. The noted difficulties with consistently implementing team-based workflows in the large teaching clinic compared with the community-based sites in this study also suggest that future work should give attention to the particular nuances of telemedicine implementation in more complex primary care settings, such as residency clinics.

CONCLUSIONS

Clinicians and staff in this study recognized the challenges but also the value and facilitators of providing telemedicine care to often marginalized populations. Continuing to understand how to strategically use team-based workflows to expand video visit access while ensuring care quality of all telemedicine visits will allow primary care practices to maximize telemedicine's flexibility and benefits for patients in safety-net settings. ■

Author Affiliations: University of California, San Francisco (MK, RW-G, EK, AS, GS, DT), San Francisco, CA; University College Dublin (MM), Dublin, Ireland.

Source of Funding: This work was supported by the Tides Foundation, in collaboration with the Center for Care Innovations and California Health Care Foundation (TF2007-093073), and the University of California, San Francisco Population Health and Health Equity Scholars program.

Author Disclosures: Dr Khoong has a career development award grant from the National Institutes of Health on team-based home blood pressure monitoring, has a grant pending from the Agency for Healthcare Research and Quality focused on team-based home blood pressure monitoring, and has received honoraria for speaking at universities about telehealth inequities. The remaining authors report no relationship or financial interest with any entity that would pose a conflict of interest with the subject matter of this article.

Authorship Information: Concept and design (MK, RW-G, EK, AS, DT); acquisition of data (MK, DT); analysis and interpretation of data (MK, RW-G, EK, MM); drafting of the manuscript (MK); critical revision of the manuscript for important intellectual content (MK, RW-G, EK, AS, GS, DT); statistical analysis (MM); provision of patients or study materials (MK); obtaining funding (MK); administrative, technical, or logistic support (MK, MM, GS, DT); and supervision (MK, AS, GS, DT).

Address Correspondence to: Marianna Kong, MD, University of California, San Francisco, Box 1315, 2540 23rd St, Floor 5, San Francisco, CA 94143. Email: Marianna.kong@ucsf.edu.

REFERENCES

- Mehrotra A, Ray K, Brockmeyer DM, Barnett ML, Bender JA. Rapidly converting to "virtual practices": outpatient care in the era of Covid-19. *NEJM Catalyst*. April 1, 2020. Accessed February 7, 2023. <https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0091>
- Keesara S, Jonas A, Schutman K. Covid-19 and health care's digital revolution. *N Engl J Med*. 2020;382(23):e82. doi:10.1056/NEJMp2005835
- Shachar C, Engel J, Elwyn G. Implications for telehealth in a postpandemic future: regulatory and privacy issues. *JAMA*. 2020;323(23):2375–2376. doi:10.1001/jama.2020.7943

4. Lin CC, Dievler A, Robbins C, Sriipatana A, Quinn M, Nair S. Telehealth in health centers: key adoption factors, barriers, and opportunities. *Health Aff (Millwood)*. 2018;37(12):1967-1974. doi:10.1377/hlthaff.2018.05125
5. Benjenk I, Franzini L, Roby D, Chen J. Disparities in audio-only telemedicine use among Medicare beneficiaries during the coronavirus disease 2019 pandemic. *Med Care*. 2021;59(11):1014-1022. doi:10.1097/MLR.0000000000001631
6. Uscher-Pines L, Sousa J, Jones M, et al. Telehealth use among safety-net organizations in California during the COVID-19 pandemic. *JAMA*. 2021;325(11):1106-1107. doi:10.1001/jama.2021.0282
7. Beheshti L, Kalankesh LR, Doshmangir L, Farahbakhsh M. Telehealth in primary health care: a scoping review of the literature. *Perspect Health Inf Manag*. 2022;19(1):1n.
8. Khoong EC, Butler BA, Mesina O, et al. Patient interest in and barriers to telemedicine video visits in a multilingual urban safety-net system. *J Am Med Inform Assoc*. 2021;28(2):349-353. doi:10.1093/jamia/ocaa234
9. Goel MS, Brown TL, Williams A, Hasnain-Wynia R, Thompson JA, Baker DW. Disparities in enrollment and use of an electronic patient portal. *J Gen Intern Med*. 2011;26(10):1112-1116. doi:10.1007/s11606-011-1728-3
10. George S, Hamilton A, Baker RS. How do low-income urban African Americans and Latinos feel about telemedicine? a diffusion of innovation analysis. *Int J Telemed Appl*. 2012;2012:715194. doi:10.1155/2012/715194
11. Gordon NP, Hornbrook MC. Differences in access to and preferences for using patient portals and other eHealth technologies based on race, ethnicity, and age: a database and survey study of seniors in a large health plan. *J Med Internet Res*. 2016;18(3):e50. doi:10.2196/jmir.5105
12. Jaffe DH, Lee L, Huynh S, Haskell TP. Health inequalities in the use of telehealth in the United States in the lens of COVID-19. *Popul Health Manag*. 2020;23(5):368-377. doi:10.1089/pop.2020.0186
13. Khoong, EC. Policy considerations to ensure telemedicine equity. *Health Aff (Millwood)*. 2022;41(5):643-646. doi:10.1377/hlthaff.2022.00300
14. Lyles CR, Wachter RM, Sarkar U. Focusing on digital health equity. *JAMA*. 2021;326(18):1795-1796. doi:10.1001/jama.2021.18459
15. Zahnd WE, Bell N, Larson AE. Geographic, racial/ethnic, and socioeconomic inequities in broadband access. *J Rural Health*. 2022;38(3):519-526. doi:10.1111/rjh.12635
16. Ye S, Kronish I, Fleck E, et al. Telemedicine expansion during the COVID-19 pandemic and the potential for technology-driven disparities. *J Gen Intern Med*. 2021;36(1):256-258. doi:10.1007/s11606-020-06322-y
17. Smith B, Magnani JW. New technologies, new disparities: the intersection of electronic health and digital health literacy. *Int J Cardiol*. 2019;292:280-282. doi:10.1016/j.ijcard.2019.05.066
18. Hsu J, Huang J, Kinsman J, et al. Use of e-health services between 1999 and 2002: a growing digital divide. *J Am Med Inform Assoc*. 2005;12(2):164-171. doi:10.1197/jamia.M1672
19. 2018 National Health Quality and Disparities Report. Agency for Healthcare Research and Quality; September 2019. Accessed November 16, 2020. <https://www.ahrq.gov/research/findings/nhqrdr/nhqrdr18/index.html>
20. Lyles CR, Sharma AE, Fields JD, Getachew Y, Sarkar U, Zephyrin L. Centering health equity in telemedicine. *Ann Fam Med*. 2022;20(4):362-367. doi:10.1370/afm.2823
21. Nouri S, Khoong EC, Lyles CR, Karlner L. Addressing equity in telemedicine for chronic disease management during the Covid-19 pandemic. *NEJM Catalyst*. May 4, 2020. Accessed February 7, 2023. <https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0123>
22. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q*. 2005;83(3):457-502. doi:10.1111/j.1468-0009.2005.00409.x
23. National Academies of Sciences, Engineering, and Medicine. *Implementing High-Quality Primary Care: Rebuilding the Foundation of Health Care*. The National Academies Press; 2021.
24. Shuemaker JC, Phillips RL, Newton WP. Clinical quality measures in a post-pandemic world: measuring what matters in family medicine (ABFM). *Ann Fam Med*. 2020;18(4):380-382. doi:10.1370/afm.2564
25. Gomez T, Anaya YB, Shih KJ, Tarn DM. A qualitative study of primary care physicians' experiences with telemedicine during COVID-19. *J Am Board Fam Med*. 2021;34(suppl):S61-S70. doi:10.3122/jabfm.2021.S1.200517
26. Sharma AE, Khoong EC, Sierra M, et al. System-level factors associated with telephone and video visit use: survey of safety-net clinicians during the early phase of the COVID-19 pandemic. *JMIR Form Res*. 2022;6(3):e34088. doi:10.2196/34088
27. Rodriguez JA, Betancourt JR, Sequist TD, Ganguli I. Differences in the use of telephone and video telemedicine visits during the COVID-19 pandemic. *Am J Manag Care*. 2021;27(1):21-26. doi:10.37765/ajmc.2021.88573
28. Srinivasan M, Asch S, Vilender S, et al. Qualitative assessment of rapid system transformation to primary care video visits at an academic medical center. *Ann Intern Med*. 2020;173(7):527-535. doi:10.7326/M20-1814
29. Donnelly C, Mills C, Gill S, Mehta K, Ashcroft R. The experience of primary care teams during the early phase of COVID-19: a qualitative study of primary care practice leaders in Ontario, Canada. *BMC Prim Care*. 2022;23(1):294. doi:10.1186/s12875-022-01907-4
30. Donegan K, Barreto EA, Sossong S, et al. Patient and clinician experiences with telehealth for patient follow-up care. *Am J Manag Care*. 2019;25(1):40-44.
31. Rabinowitz G, Cho LD, Benda NC, et al. The telemedicine experience in primary care practices in the United States: insights from practice leaders. *Ann Fam Med*. 2023;21(3):207-212. doi:10.1370/afm.2967
32. Etz RS, Solid CA, Gonzalez MM, Britton E, Stange KC, Reves SR. Telemedicine in primary care: lessons learned about implementing health care innovations during the COVID-19 pandemic. *Ann Fam Med*. 2023;21(4):297-304. doi:10.1370/afm.2979
33. Hall TL, Connelly L, Staton EW, et al. Points of concordance, points of discordance: a qualitative examination of telemedicine implementation. *J Am Board Fam Med*. 2022;35(3):517-526. doi:10.3122/jabfm.2022.03.210325
34. Cunningham AT, Feltner J, Smith KR, et al. Burnout and commitment after 18 months of the COVID-19 pandemic: a follow-up qualitative study with primary care teams. *J Am Board Fam Med*. 2023;36(1):105-117. doi:10.3122/jabfm.2022.220226R1
35. Leung PB, Nahid M, Rusli M, et al. Factors associated with never having had a video visit. *J Am Board Fam Med*. 2022;35(3):634-637. doi:10.3122/jabfm.2022.03.210483
36. Wray CM, Tang J, Shah S, Nguyen OK, Keyhani S. Sociodemographics, social vulnerabilities, and health factors associated with telemedicine unreadiness among US adults. *J Gen Intern Med*. 2022;37(7):1811-1813. doi:10.1007/s11606-021-07051-6
37. Lindenfeld Z, Berry C, Albert S, et al. Synchronous home-based telemedicine for primary care: a review. *Med Care Res Rev*. 2023;80(1):3-15. doi:10.1177/10775587221093043
38. Ghorob A, Bodenheimer T. Sharing the care to improve access to primary care. *N Engl J Med*. 2012;366(21):1955-1957. doi:10.1056/NEJMp1202775
39. Sinsky CA, Jerzak JT, Hopkins KD. Telemedicine and team-based care: the perils and the promise. *Mayo Clin Proc*. 2021;96(2):429-437. doi:10.1016/j.mayocp.2020.11.020
40. Marshall MN. Sampling for qualitative research. *Fam Pract*. 1996;13(6):522-525. doi:10.1093/fampra/13.6.522
41. Strauss A, Corbin J. *Basics of Qualitative Research*. Sage Publications; 1998.
42. RE-AIM. Accessed June 16, 2021. <https://re-aim.org/>
43. Feldstein AC, Glasgow RE. A practical, robust implementation and sustainability model (PRISM) for integrating research findings into practice. *Jt Comm J Qual Patient Saf*. 2008;34(4):228-243. doi:10.1016/s1553-7250(08)34030-6
44. McCreight MS, Rabin BA, Glasgow RE, et al. Using the Practical, Robust Implementation and Sustainability Model (PRISM) to qualitatively assess multilevel contextual factors to help plan, implement, evaluate, and disseminate health services programs. *Transl Behav Med*. 2019;9(6):1002-1011. doi:10.1093/tbm/ibz085
45. Garg A, Goyal S, Thati R, Thati N. Implementation of telemedicine in a tertiary hospital-based ambulatory practice in Detroit during the COVID-19 pandemic: observational study. *JMIR Public Health Surveill*. 2021;7(1):e21327. doi:10.2196/21327
46. Anaya YB, Bañuelos Mota A, Hernandez GD, Osorio A, Hayes-Bautista DE. Post-pandemic telehealth policy for primary care: an equity perspective. *J Am Board Fam Med*. 2022;35(3):588-592. doi:10.3122/jabfm.2022.03.210509
47. Wisniewski H, Gorrindo T, Rauseo-Ricupero N, Hilty D, Torous J. The role of digital navigators in promoting clinical care and technology integration into practice. *Digit Biomark*. 2020;4(suppl 1):119-135. doi:10.1159/000510144
48. Richwine C, Johnson C, Patel V. Disparities in patient portal access and the role of providers in encouraging access and use. *J Am Med Inform Assoc*. 2023;30(2):308-317. doi:10.1093/jamia/ocac227
49. Baughman DJ, Jabbarpour Y, Westfall JM, et al. Comparison of quality performance measures for patients receiving in-person vs telemedicine primary care in a large integrated health system. *JAMA Netw Open*. 2022;5(9):e2233267. doi:10.1001/jamanetworkopen.2022.33267
50. Westby A, Nissly T, Giesecker R, Timmins K, Justesen K. Achieving equity in telehealth: "centering at the margins" in access, provision, and reimbursement. *J Am Board Fam Med*. 2021;34(suppl):S29-S32. doi:10.3122/jabfm.2021.S1.200280

Visit ajmc.com/link/89550 to download PDF and eAppendix

eAppendix A. Video visit support pool workflow script

“Hello, may I speak with _____? (When patient is on phone): My name is _____ and I’m calling from [CLINIC].

I am calling in regards to your upcoming Video appointment with [Provider] on _____ [day/date/time]. I am calling to help walk you through the steps and help answer any questions.

Do you have time now to review how to access your video visit?

If patient answers NO: *“No worries. Is there a better day or time I can call you back at?”*

notes to themselves “Will attempt to call patient on XX/XX/XXXX”

“Thank you for your time. I will call you at your suggested day and time”

If patient answers YES: *“To ensure you have a successful video visit, I have a few questions”*

1. *“Do you have a device with a camera to use for the visit? (Smartphone* iPad/tablet, computer)”*

If patient does not know if they have a smartphone: ask if have they have used/downloaded an app, (Facebook, WhatsApp, etc), used the internet, have facetimes a family member/friend

2. *“Do you have Wi-Fi? OR an unlimited data plan* on your phone?”*

**Video visits can use a lot of mobile data; not be ideal for patients without Wi-Fi who have limited data plans*

If “yes” to both questions:

“What device will you use to join your video visit?”. If you use your phone, your provider will send you a text message. If you use an iPad or computer, you will get an email. The text/email will have a link for you to click to join your video visit.”

“Your provider will send the link on the day of your appointment when they are ready to meet with you.”

(Confirm phone number and/ or email address. Add in appt notes if patient would like to receive email or text message. They can also receive both).

*“To access your video visit, all you need to do is open (click) the link and press "allow" when it asks you to connect your microphone and camera. Then you will see a button that says, "Join Call." After you press that button, you will be able to see your provider on the screen. **Please make sure you are in a quiet, private space for your video visit.**”*

“If for any reason the video visit does not happen, do not worry. Your provider will call you and you will have a telephone visit instead.”

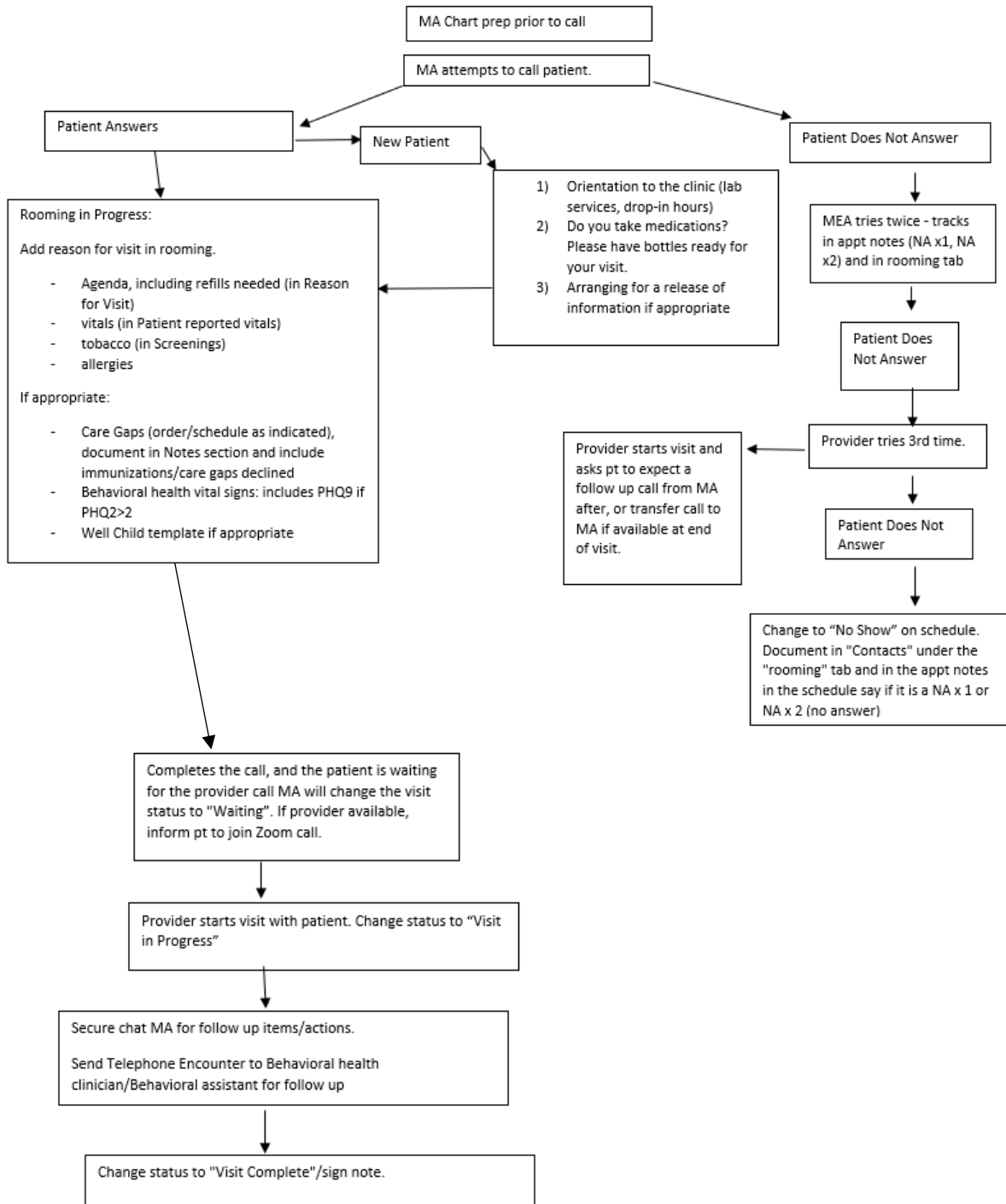
(Offer a practice trial to the patient, and answer any outstanding questions.)

If “no” to one or both questions:

“Unfortunately, you will not be able to have a video visit with your provider. We can schedule this as a telephone appointment for you. In the future, if you have access to a device with a camera and microphone AND Wifi/ unlimited data plan please let your Provider know and we can schedule a video visit.”

eAppendix B. Telemedicine healthcare maintenance workflow

Before Visit/ Day of Visit



Abbreviations:
 MA = Medical assistant
 NA = No answer

eAppendix C. Clinician/staff interview guide

Questions

- 1) What type of work do you currently do in the clinic?
- 2) Let's start with some background on how telehealth is being used at your clinic.
 - a. How often are different visit types are being used currently [in person, video, phone]? Which types are being used most/least?
 - b. How has this changed since the beginning of the pandemic?
- 3) For a typical in person visit, how is preventive care (like cancer screenings or immunizations) usually done for a patient? What about for a phone visit? For a video visit?
 - a. Probe: Who starts/prompts this care? When/how?
 - b. How has this changed since the beginning of the pandemic?
- 4) For a typical phone visit, how is chronic care (like getting diabetes care for patients with diabetes) usually done? What about for a video visit?
 - a. Probe: Who starts/prompts this care? When/how?
 - b. How does this differ from an in person visit?
 - c. How has this changed since the beginning of the pandemic?
- 5) At your clinic, how do you typically prepare patients for their phone visits (e.g., informed them what to expect from the phone visit, remind them to have their home monitoring/medications/questions prepared, other)?
 - a. Who does this? When/how?
 - b. How has this changed since the beginning of the pandemic?
- 6) At your clinic, how do you typically prepare patients for their telehealth video visits (e.g., helped them download an app, walk through how to log on for a visit, other)?
 - a. Who does this? When/how?
 - b. How has this changed since the beginning of the pandemic?
- 7) In addition to what we just discussed in terms of changes between use of telehealth at the start of the pandemic and now [LIST CHANGES DISCUSSED ABOVE], in what other ways has your clinic's use of telehealth evolved?
- 8) How has the response to telehealth been at your clinic from the perspective of [interviewee's role]?
 - a. How has it impacted your daily work?
 - b. Has this changed over the course of the pandemic?
- 9) Are there some telehealth workflows in the clinic that are working well? Others that are NOT working well? Why/why not?
 - a. In what ways, if any, have the clinic's telehealth workflows made your job easier?

- b. In what ways, if any, have the clinic's telehealth workflows made your job harder?
- 10) In your view, how has the shift to telehealth impacted:
- a. Quality of care
 - b. Access to care for different patient populations (probe: unstable housing, non-English speakers, undocumented, uninsured)
 - c. Feeling exhausted or burned out at work?
- 11) Anything important we have left out of the discussion that would help us understand the impact of telehealth at your clinic?