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Pursuing Equitable Video Visit Access: A Clinical Algorithm Informed by Qualitative Data Collection from Clinical Teams and Patients

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Title: Pursuing Equitable Video Visit Access: A Clinical Algorithm Informed by Qualitative Data Collection from Clinical Teams and Patients

Running Title: Clinical algorithm for video visit access

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Abstract:

Objective: The COVID-19 pandemic sparked exponential growth in video visit use in primary care. The rapid shift to virtual from in-person care uncovered concerns about exacerbations of digital access disparities across racial groups and rural populations. Moving forward, it is critical to understand when and how to incorporate video visits equitably into primary care. We sought to develop a novel clinical algorithm to guide primary care clinics on when and to employ video visits as part of care delivery.

Setting: 3 rural primary care clinics

Participants: 24 Black veterans living in rural areas and 3 primary care teams caring for Black veterans living in rural areas

Primary and secondary outcome measures: Findings from semi-structured interviews with patients and focus groups with primary care teams.

Results: Key issues around appropriate use of video visits for clinical teams included having adequate technical support, encouraging engagement during video visits, and using video visits for appropriate clinical situations. Patients reported challenges with broadband access, inadequate equipment, concerns about the quality of video care, the importance of visit modality choice, and preferences for in-person care experience over virtual care. We developed an algorithm that requires input from both patients and their care team to assess fit for each clinical encounter.

Conclusions: Informed matching of patients and clinical situations to the right visit modality, along with individual patient technology support could reduce virtual access disparities.

Trial registration: NA

Article Summary

Strengths and Limitations of the study:

1. Primary qualitative data collection from patients and care providers in the same clinical catchment area.
2. Data collection centered on a historically under-resourced population to promote equitable clinical algorithm development.
3. Stakeholder engagement in data collection tool development.
4. Iterative development of clinical algorithm rooted in current clinical practice to facilitate readiness for implementation.

Introduction

The optimal role of video visits within primary care is undefined. With the onset of COVID-19, the need to stem potential viral transmission led to dramatic and rapid shifts from in-person to virtually-delivered care including video-based care. Video offers assessment and communication advantages not possible with phone alone (e.g., visualizing a rash), may support better patient-provider rapport building [1], and receives higher remuneration from private insurers [2]. However, video-based care comes with distinct challenges for clinical teams (e.g., new clinic workflow) and patients (e.g., device access, technical literacy). In the absence of clear evidence, there is an urgent need to identify the right telehealth modality for the right clinical problem for the right patient at the right time [3].

Finding the optimal role for virtual primary care is particularly critical for historically marginalized and under-resourced populations. While telephone-delivered care may increase access to care[4], early findings show that when compared to phone-based care, systemically disadvantaged populations (e.g. older adults, those in rural or low bandwidth areas, racial and ethnic minorities, unhoused individuals) are less likely to engage in video visits [5, 6]. Compared to phone, access disparities were more pronounced with video visits due to requirements for digital literacy, higher cost, camera-ready phones or computers, and access to adequate bandwidth [5, 7-10]. These findings underscore the structural determinants of telehealth access disparities, including structural racism and unequal access to internet access [11, 12]. Addressing inequitable engagement in virtual care and related access disparities requires action at multiple levels from national policy to individual clinic practices.

Our objective was to develop a clinical algorithm to guide when and how to incorporate video visits into primary care delivery. For this algorithm to support equitable video visit access, we focused our data collection on patients who have historically experienced systemic healthcare access limitations. As the largest provider of US primary care and a national telehealth leader, the Department of Veterans Affairs Health Care System (VA) is an optimal setting to examine how to optimize virtual care delivery. Thus, we engaged populations at increased risk for low video uptake, specifically rural, Black veterans [6, 8, 13]

Materials and Methods

Data collection occurred among patients and clinical team members of VA outpatient primary care clinics in [redacted] which serve large populations of rural dwelling individuals. All study activities were reviewed and approved by the Durham VA Health Care System Institutional Review Board (IRB #02312). We followed COREQ guidelines for reporting of qualitative research where applicable[14].

Framework: We anchored our approach on the conceptualization of access developed by Fortney and colleagues [15]. This model emphasizes actual and perceived access to virtual and in-person care and guided our data collection materials (e.g., interview guides, matrix analysis, structured note templates), eligibility criteria (e.g., users, non-users), and debriefing sessions among the research team.

Setting: We defined rurality using Rural-Urban Communicating Areas (RUCA) consistent with the VA Office of Rural Health [16]. At the time of data collection, all clinics were providing in-person, telephone-based, and video-based care, though virtual

care, including video-based care, was encouraged across the VA health care system due to the pandemic [17].

Patients: We conducted semi-structured interviews with veterans identified as Black in the electronic health record, who were engaged in VA health care (i.e., ≥ 1 primary care visits within the prior 12 months) and lived in rural areas. Recruitment was stratified by patients who had completed at least one video-based primary care encounter and those who had not. The research team contacted potential participants via mailed letter and then phone. We obtained verbal consent.

All interviews were conducted and recorded via WebEx (audio-only) between February-May 2021 by a study team member (KP) who identifies as white and has training in qualitative methodology. The interviewer listened to audio recordings and took templated notes. To ensure reliability and validity, a second study team member (AL, KG, LZ, MSB, CW) independently listened to interviews, reviewed, and amended interviewer notes. Responses to each domain were summarized using matrix analysis for participants stratified by previous video visit experience. Summary responses were generated independently by two team members and reviewed by a third reviewer.

Patient and Public Involvement: The driving question for this project was developed in response to trends in patient utilization of video-based care and the need to obtain patient preferences and experiences directly from the patients themselves. We received consultation on our approach from the [redacted] Veteran Engagement Panel and the [redacted] Antiracism and Black Equity Advisory Board, however, patients were not directly involved in the conduct of this work.

Primary Care Teams: We invited all primary care team members from 4 VA primary care clinics serving [redacted] to participate in clinic specific focus groups. We conducted focus groups between December 2020 and February 2021 using WebEx video-conferencing platform. Participants were encouraged to turn on their cameras if available and to make use of the chat function. The same team member conducted patient interviews and provider focus groups. Focus groups were first given the opportunity to review and provide feedback on a process map [18], or explicit step-by-step illustrative flow diagram of a proposed approach to the incorporation of video-visits into primary care based on existing workflow in our institution (see Appendix 1). Discussions followed the focus group guide. Research team members (n=3) took notes during focus groups using structured templates. A rapid qualitative approach and matrix method were used to identify focus group themes [19-21]. Notes from the structured templates were consolidated into matrices consistent with Fortney model domains. This matrix analysis approach was paired with real-time iterative team-based analysis [22]. A subgroup of team members (KP, KG, CW, AL, MSB, LZ) met virtually during data collection to review domain level findings and identify implications for primary care video-based care delivery.

Virtual care algorithm generation: We based the initial algorithm structure on our proposed process map of virtual care incorporation into primary care workflow (Appendix 1) and standards for clinical algorithm development [23]. Working from the patient interviews and clinical team focus group findings, we then combined themes with direct implications for when and how to incorporate video-based visits into primary care delivery (see Figure 1). For example, we added guidance on when in-person care could

be preferable over video visits. Our research team iteratively revised the algorithm and offered clinical team focus group participants the opportunity to review it. Ultimately, our novel algorithm seeks to guide choice of video or an in-person care should be offered to a specific patient with a given clinical situation and informed by their existing technical skills and equipment.

Results

We conducted four video-based focus groups across three clinics. Focus group participants included physicians, advanced-practice providers, administrative staff members, and nurses within 3 rural VA primary care clinics (n=38). We conducted 26 individual patient interviews with Black veterans; 14 among individuals with a prior video-based visit and 12 without. Eleven of the 24 individuals who had video visit experience reported receiving help to participate in the visit (Table 1).

Table 1. Characteristics of Patients Participating in Semi-structured Interviews

	Prior Video Visit N = 14	**No Prior Video Visit N = 12**
Age, mean (SD)	64.50 (SD 9.00)	69.08 (8.69)
Gender*		
Male	11	12
Female	3	-
Tech self-efficacy †	Mean=4	Mean=4.291667
<3	2	2
3-5	12	9
VA primary healthcare source		
Yes	11	11
No	-	1
Not sure	3	1
Distance to closest VA		
0-20 miles	4	5
21-80 miles	9	6
missing	1	1
No. prior video visits		
0 visits	-	12

1 visit	2	-
2-10 visits	7	-
>10 visits	5	-
No. prior telephone visits		
0 visits	2	2
1 visit	-	-
2-10 visits	7	10
>10 visits	5	-
Received help for video visit		
Yes	11	1
No	2	10
Not sure	1	1
Device used for video visit		
iPhone	5	-
Android phone	5	-
Tablet	2	-
Laptop or computer	2	-
Don't have any devices to use	0	-
Reliable broadband		
Yes	11	6
No	1	5
Not sure	2	1
Reliable device		
Yes	12	9
No	2	2
Not sure	0	1
Racism in health care (M across items, SD, # of respondents) ‡	2.80 (1.17) for n=11	3.02 (0.72) for n=10
Endorsed Agreement with:		
RHC 1: Doctors treat African American and White people the same. (N, %, # respondents)	2 (18.2%) of 11	7 (58.3%) of 12
RHC 2: Racial discrimination in telehealth is common. (N, %, # respondents)	6 (50.0%) of 12	5 (50.0%) of 10
RHC 3: In most hospitals, African American and Whites receive the same kind of telehealth care. (N, %, # respondents)	5 (41.6%) of 12	4 (36.4%) of 11
RHC 4: African Americans can receive the telehealth care they want as equally as White people can. (N, %, # respondents)	5 (38.5%) of 13	4 (36.4%) of 11
Personal discrimination scale (M across items, SD) §	2.01 (0.75)	1.98 (0.77)
Endorsed Experiencing:		
PDS 1: Treated with less courtesy than other people? (N, %, # respondents)	10 (71.4%) of 14	6 (60.0%) of 10
PDS 2: Treated with less respect than other people? (N, %, # respondents)	11 (78.6%) of 14	7 (70.0%) of 10
PDS 3: Received poorer services than other people? (N, %, # respondents)	9 (69.2%) of 13	7 (70.0%) of 10

PDS 4: Had a doctor or nurse act as if he or she thinks you were not smart? (N, %, # respondents)	6 (42.9%) of 14	3 (30.0%) of 10
PDS 5: Had a doctor or nurse act as if he or she was afraid of you? (N, %, # respondents)	4 (28.6%) of 14	5 (50.0%) of 10
PDS 6: Had a doctor or nurse act as if he or she was better than you? (N, %, # respondents)	9 (64.3%) of 14	5 (55.6%) of 9
PDS 7: Felt like a doctor or nurse was not listening to what you were saying? (N, %, # respondents)	11 (78.6%) of 14	7 (70.0%) of 10
Telehealth satisfaction scale (M across items, SD, # of respondents)	1.83 (0.49) for n=13	2.02 (0.19) for n=9

*****as identified in chart

† Measure by response to the following question: How confident are you that you can complete the steps necessary that you identified above to attend a video visit with your provider on a scale of 1-5? One participant in the No prior Video Visit group did not provide an answer for this question.

‡ Racism in Healthcare measure (Hausmann et al[35]) agreement defined as marking "agree" or "strongly agree." Average score computed with item 2 reverse coded; range of possible score by question 1-5 with 1 = strongly disagree and 5 = strongly agree

§ Personal discrimination scale adapted from Everyday discrimination scale[36]; endorsement marked by any response other than "Never" for all questions; range of possible score by question 1-5 with 1 = never and 5 = always

Telehealth Satisfaction Scale (TeSS [17])[37] is a 10-item measure with with range of possible score by question from 1 to 3 with 1 = "excellent" and 3 = "Poor/fair".

Scale scores for RHC, PDS, and TeSS only computed when all items were answered.

Patient interviews lasted from 25-45 minutes and focus groups from 45-60 minutes. We present themes from patients and clinical team data collection.

Patient Findings

Perceived access to care: Most patients did not report personally experiencing or witnessing in others receiving differential access to care due to personal identity. However, several patients noted differential treatment around receipt of benefits, pain medication, and appointment scheduling: "*…All my life, from the service part all the way up to where [I am] today, I feel like I've had to fight for myself…"* (video-user). Reasons for differential treatment were attributed to characteristics such as age, racial identity, disability status, and/or a history of substance use disorder.

Patients commonly reported challenges to video-based visits due to having inadequate technical skills or a lack of access to needed equipment/broadband. Only half of patients who had successfully completed video-based visits previously felt confident in their ability to access video-based care in the future. For patients who did feel confident, having a successful first video visit experience was reassuring. Among those without a prior video visit, there were varying degrees of confidence: "*I've never used a computer, so I'm a little shaky of it, you understand?.... because if I get the thing and I don't know how to use it, that's not worth a nickel…You hit one wrong button and you're out of business*" (video non-user).

Satisfaction with care: Patients expressed multiple concerns about receiving care by video. First, patients commonly reported perceptions that video visits were of lower quality and more impersonal compared to in-person: "*Face to face makes it feel that I matter, that I'm important to the provider" (*video-user*)*. Second, patients with and without prior video visits noted concerns about a provider's ability to adequately assess medical concerns via video: "*They can't make medical decisions without seeing you in the face, looking at your body"* (video-user). Third, many patients reported completing telephone-based visits and generally perceived phone-based visits to be lower quality than either in-person or video: "*it is hard to know on* [the] *phone [what the provider] is doing, whether they're listening to you or understanding what you are saying. I'd prefer in-person visits, but video would be the next best thing" (*video non-user*)*. Finally, patients wanted to choose whether to have their primary care encounter in-person or via video. Many patients reported being told that their visit would occur via video rather than being offered a choice. Some patients who had not completed video-based visits

thought that they might feel more relaxed and less rushed at home: "*Very convenient if I'm going to stay on top of my health" (*video non-user*)*.

Preferences for care: While patients acknowledged the potential convenience of video-based care, most individuals still preferred in-person: "*given the conditions we face today* [*COVID-19 pandemic*]*, I understand it. But my preference is in the office*" (video non-user). Reasons given for this preference centered on the experience of in-person care: *"If it was up to me, I'd go to the VA. It is a form of release for me…It's a way for me to get out of the house"* (video-user). In-person care also was noted to offer better eye contact, rapport building, communication, physical exam, and the opportunity to coordinate care. The majority of patients thought visit modality should be tied to clinical need. Most veterans preferred video for mental health, while in-person was preferred for specific conditions, such as pain or urgent concerns. This preference appears to be related to a sense that either the provider could not fully evaluate the patient remotely or the patient could not fully communicate their concerns when not face-to-face: "*They can see what's going on and know if you're having any difficulties. On video, you have to stay in one position, they don't know how you feel, you're just talking…in person, they can tell if you're not genuine" (*video-user*)*.

Clinical team member findings

Perceived access to care: Clinical teams noted that digital connectivity could present problems for accessing care. Specifically, video platform malfunction could consume significant visit time. Additionally, many providers were uncomfortable with available technology for video visits. Team members noted a diminished interpersonal connection during video-based visit and that sometimes both parties (patients and clinicians) were

distracted or not fully engaged. Difficulty engaging with certain patients via video was particularly problematic – specifically those with cognitive impairment or significant sensory or functional impairments. One strategy to overcome technical barriers was having a family member or friend provide logistical support during a video visit. Overall, clinical teams reported that patients living in rural areas and older patients had the most difficulty engaging in video-based care due to limited availability of and comfort with technology.

Satisfaction with care: Clinicians felt that video visits were inadequate for certain situations and often scheduled without regard to clinical appropriateness of the modality. Management of chronic condition (e.g., hypertension) was given as a specific example that could be appropriate for video, as were dermatologic conditions, mental health, and non-traumatic single joint pain. Clinical conditions not appropriate for video would include new patient visits, patients with cognitive impairment, or new conditions.

Preferences for care: Clinicians expressed frustration when video-based care did not align with the patient's clinical problem. In addition, teams noted a significant need for streamlining the clinic workflow process which was felt to be designed for in-person visits and not conducive to virtual care. For example, there is no one identified to be able to contact patients in advance to verify that they have a working link for the video visit and verify that they are 'checked-in' online before an appointment due to in-person clinic demands.

Clinical algorithm

We identified two key decision points for matching a specific patient to a particular modality for an encounter. First, it is important to determine if the patient and their health concerns are clinically appropriate for video; second, patients need to be assessed for readiness for video visits (e.g., having accessible technology, adequate technical skills); three, patients need to agree to video modality use. These decision points seem to be implied in the existing primary care processes, but were not explicit or consistently applied. We combined these decision points into one ready-to-implement algorithm to clearly link the importance of both clinical appropriateness and patient readiness. First, the algorithm prompts clinical consideration of the appropriateness of a patient's current clinical concern for visit modality type (see Figure 2). Once a patient situation is deemed clinically appropriate for video-based care, the algorithm then requires a patient's response regarding interest in video-based care. If the patient is interested in a video visit, the algorithm proceeds to incorporate what equipment and technological support are needed in advance of the video appointment. Also identified through the integration of patient and clinical team findings were key video visit preparation steps (Table 2)

Table 2. Clinician and patient experiences with primary care video visits

Domain	Patient	Clinical Team	Implications for clinical algorithm
Perceived access to video-based care	• Some experiences of differential treatment by personal identity in health care setting • Barriers: Technical skills and equipment, lack of confidence • Scheduling generally easy	• Video platform malfunctions take up valuable clinical time • Diminished interpersonal connection with patients • Not appropriate for patients with specific limitations (e.g. cognitive impairment, significant sensory impairment) • Rural dwelling and older adults had most difficulty accessing video visits • First video visit was the hardest • Family friends can be helpful	• Clinical team training to optimize interpersonal rapport via video • Clinical triage for video visit appropriateness • Offer all patients opportunity to practice video visits prior to scheduled appointment, especially before first visit • Encourage patient to recruit family/friends for assistance • Assess patient preparedness for video visit (including broadband access, equipment, technical literacy)
Satisfaction with video-based care	Negative aspects of video visits: • Impersonal • Inadequate for quality medical care • Providers distracted • Technical barriers Positive aspects of video visits: • More relaxed • Less rushed • Desired choice for visit modality	• Video inadequate for some clinical presentations • Video not appropriate for new patient visits	• Transparency with patients about when video is appropriate and why it is being offered • Use same approach regarding modality choice for all patients • Enlist technical support for troubleshooting • Establish a back-up plan for connection in advance of appointment (e.g. alternate video platforming, telephone) • Prepare patients for optimal engagement • Give patients choice of participating in video visit
Attitudes towards video-based care	• Many preferred in-person despite convenience of video • In-person care perceived as better than video	• Frustrated when modality choice made without consideration for clinical appropriateness	• Allow in-person as per patient preference • Adapt clinic team workflow to support multi-modality clinical care

	• Appeal of ritual of in-person care • Video not always best for patient needs	• Need for clinic workflows to adapt to virtual care requirements • Management of video-based visit needs should not fall solely on providers	• Interdisciplinary collaboration around video visit workflow

and core components of important patient facing materials for video visit preparation (Table 3).

Table 3. Patient teaching points before a video visit

Patient Teaching Before Video Visit		
At Scheduling	In Advance of Visit	During a Visit
Explain when video visit is appropriate	Prepare for visit as you would an in-person visit	Limit distractions
Explain that clinical team will determine appropriateness	Join video platform at least 15 minutes early	Do not multi-task during visit (e.g., do not clean house)
Give patients a choice	Ensure visual and auditory privacy	Do not drive during video visit
	Recruit a family member to help	Be aware that your provider may at times not be making eye contact while looking at medical record on a second screen
	Create a back-up plan	

Discussion

We identified patient and primary care team experiences with video visits across key dimensions of telehealth access and used our findings to develop a novel algorithm to guide the incorporation of equitable video visits into primary care. Consistent with previous literature, we confirmed that clinicians have concerns about technology malfunction and inadequate technical support, and recognize the importance of having a family or friend to manage the technology during a visit [24-26]. Our study provides new insight in virtual care use. We found that patients are concerned with quality of

video-based care, prefer to have choice of visit modality, and place personal value on in-person experience despite convenience costs.

Our intention was to develop an algorithm that could support equitable access to virtual care; however, we did not identify a pattern about which patients would prefer video-based care. Thus, we incorporated features intended to promote access equity: 1) emphasized the importance of using this algorithm with all patients to avoid implicit bias regarding who may or may not want a video visit and and/or need technological support; 2) underscored patient choice regarding visit modality when possible; 3) identified actions to promote optimal patient engagement during a video visit; and 4) recognized clinician behaviors that promote trustworthiness and transparency during video-based encounters.

We identified that both patients and clinicians expressed concerns about the impact of video visits on patient-provider relationship and subsequent clinical care quality. In particular, patients expressed misgivings about quality of care received via video. While the importance of patient confidence in virtual care has been previously noted [27, 28], our study adds that this may not be true for all types of care OR at all points in the care continuum. Similar to patients, clinicians commonly described concerns about the interpersonal quality of virtual clinical interactions, especially around building rapport with new patients [29] and loss of body language and social cues [30, 31]. Strategies to improve the virtual care experience including improving accessibility through access to closed captioning and language interpretation [32], incorporation of trauma-informed care principles such as transparency about during visit actions and maintaining good eye contact [32, 33], and adequate technology training for patients and clinical teams

[24, 34]. Together with previous findings, our work points to the need for an intentional approach to the implementation of high-quality, equitable, patient-centered video-based care.

This research has limitations. First, our clinical support algorithm was informed by qualitative data from clinical teams in rural North Carolina and Black veterans residing in rural areas. However, it may be applicable to other rural, minoritized patients using virtual care in other health care systems with similar reimbursement pressures. Second, we focused on the context of primary care and, thus, the algorithm may not be relevant to specialty care. For example, specialty clinics typically provide care for individual conditions or organ systems for which it may be easier to predict clinical appropriateness of video-based care. Third, we focused this algorithm on the choice between video-based visits vs care delivered in-person because health care system and insurance reimbursement policies have generally favored video-based care and not phone-based care. Additionally, telephone has been used for patient care for decades in the VA. For clinics that continue to employ telephone as an equivalent to in-person care, this algorithm will not address clinic workflow needs. Fourth, the interviewer for both the focus groups and the patient interviews identifies as white, which may have influenced participant willingness to disclose racial discrimination experiences. Our center has made a focused effort to hire and train diverse qualitative staff since the conclusion of this work. Finally, determinants of access to health care expand beyond clinic level policies and actions thus broader innovation and changes will be required to address access disparities.

Conclusions

Optimal and equitable incorporation of video visits into primary care delivery requires thoughtful planning and potential re-working of clinic workflow. Assessment of clinical appropriateness of a virtual modality as well as patient preference and technological readiness are crucial before each visit. Next steps for this work include evaluating the feasibility of our algorithm in a primary care practice and validating measures to assess patient interest in video visits. It will be critical to identify determinants of video visit uptake and areas needing adaptation for site specific characteristics. Informed matching of patients and clinical situations to the right visit modality, along with individual patient technology support could contribute to broader virtual access disparities.

Figure Legend

Figure 1. Algorithm Development Process

Figure 2. Clinical Support Algorithm for Incorporation of Video Visits into Primary Care Workflow

Appendix. Process Map of Pre-existing Primary Care Workflow for Incorporation of Video-Based Care

Prior Presentations: Partial findings from this project were presented at the 2021 Dissemination and Implementation Virtual Conference.

Contributorship Statement: KMG co-conceptualized this project, participated in data collection, analysis and interpretation, and drafted this work; KRP developed data collection and analysis plan, collected the data, contributed to analysis, and edited the manuscript; AL, CW, and MSB participated in data collection, analysis and interpretation, and edited the manuscript;

HBB contributed to conceptualization, interpretation, and edited this manuscript. HW supported data collection and analysis and edited this manuscript; DVB contributed to data analysis, interpretation and edited this manuscript. LLZ co-conceptualized this project, participated in data collection, analysis and interpretation, and drafted this work.

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Patients
Semi-structured Interviews

Purpose:

- Obtain patient experiences and perceptions of video-based primary care
- Center data collection on patient population which has historically experienced systemic healthcare access barriers

Participants

Rural-dwelling, African-American veterans with at least one primary care visit in the last 12 months

Questions guided by:

Fortney conceptualization of access to care (e.g., perceived access to care, satisfaction with care)

Overall goal:
To develop an equitable, patient/clinician centered algorithm to optimize the use of video-visits in primary care

- Integration of findings from both samples with direct implications for when and how to incorporate video visits into primary care delivery
- Findings were organized across common themes and compared to identify ideal balance across patient/clinician perspectives of use of video visits.
- Development and iterative review of algorithm building on existing clinic workflows

Developed algorithm to support incorporation of video visits into primary care delivery

Primary Care Team
Focus Groups

Purpose:

- Obtain clinical team experiences and perceptions of delivery care via video-visits
- Solicit clinically appropriate role for and incorporation of video visits in primary care delivery

Participants

Multi-disciplinary primary care team members serving large rural population in the Southeastern US

Questions guided by:

Process map of existing workflow for video visits; Fortney conceptualization of access to care (e.g., digital connectivity, quality of interpersonal experience)

Patient seeking primary care clinical visit

Consider Patient Factors

- Is patient new to clinic/provider?
- Does the patient have cognitive impairment?
- Does patient have sensory impairment *(significant hearing loss or visual impairment*)?

Yes → Schedule in-person visit

Initiate Clinical Triage

- Does patient require urgent, in-person evaluation *(eg, altered mental status, difficulty breathing, chest pain)?*

Yes → Refer for emergent care

No

Continue Clinical Triage

- Is patient's concern a chronic medical issue *(eg, single joint pain, stable mental health conditions, chronic disease management)?*
- Has the patient's concern been identified as appropriate for video-based evaluation?

No → Schedule in-person visit

Yes

Assess video access and interest

- Is patient interested in conducting visit by video?
- Does patient have video-capable equipment?
- Does patient have access to high-speed internet or broad band?
- Does patient have access to location with auditory and visual privacy?

No → Schedule in-person visit

Yes

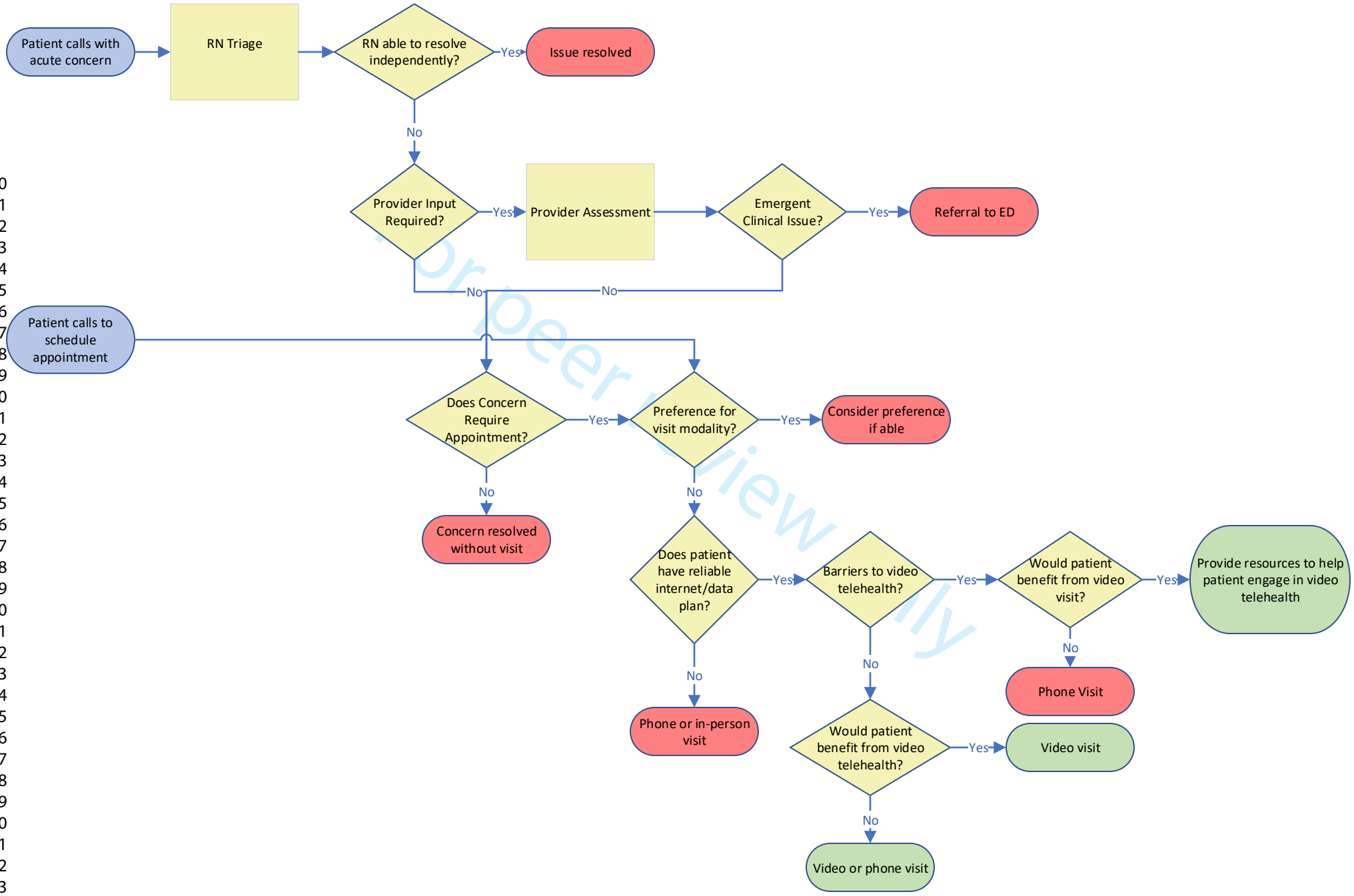
Assess need for technical assistance

- Has patient successfully completed a previous video-based visit on current platform?
- Does patient have family or friends that could assist with technology?

Yes → Schedule video visit

No

Schedule for video-based visit **and** encourage patient to conduct test video-visit call



Appendix 1. Process Map of Pre-existing Primary Care Workflow for Incorporation of Video-based Care
Developed by CW building from experience with local quality improvement telehealth projects

Standards for Reporting Qualitative Research (SRQR)*

http://www.equator-network.org/reporting-guidelines/srqr/

	Page/line no(s).
Title and abstract	
Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	1
Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	2-3
Introduction	
Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	4-5
Purpose or research question - Purpose of the study and specific objectives or questions	5
Methods	
Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	5-7
Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	6
Context - Setting/site and salient contextual factors; rationale**	6
Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**	6-7
Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	5
Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	6-7

Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	6-7
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	6-7
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	6-8
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	6-8
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	5-7

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	8-11
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	Table 1 & 2

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	12-15
Limitations - Trustworthiness and limitations of findings	14

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	3
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	3

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
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How can equitable video visit access be delivered in primary care? A qualitative study among rural primary care teams and patients

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Title: How can equitable video visit access be delivered in primary care? A qualitative study among rural primary care teams and patients

Running Title: Clinical algorithm for video visit access

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Key Words: virtual care, primary care, telemedicine, racial disparities, rural disparities

Word Count: 2993

Abstract:

Objective: The COVID-19 pandemic sparked exponential growth in video visit use in primary care. The rapid shift to virtual from in-person care exacerbations digital access disparities across racial groups and rural populations. Moving forward, it is critical to understand when and how to incorporate video visits equitably into primary care. We sought to develop a novel clinical algorithm to guide primary care clinics on how and when to employ video visits as part of care delivery.

Design: Qualitative data collection; 1 team member conducted all patient semi-structured interviews and led all focus groups with 4 other team members taking notes during groups

Setting: 3 rural primary care clinics

Participants: 24 Black veterans living in rural areas and 3 primary care teams caring for Black veterans living in rural areas

Primary and secondary outcome measures: Findings from semi-structured interviews with patients and focus groups with primary care teams.

Results: Key issues around appropriate use of video visits for clinical teams included having adequate technical support, encouraging engagement during video visits, and using video visits for appropriate clinical situations. Patients reported challenges with broadband access, inadequate equipment, concerns about the quality of video care, the importance of visit modality choice, and preferences for in-person care experience over virtual care. We developed an algorithm that requires input from both patients and their care team to assess fit for each clinical encounter.

Conclusions: Informed matching of patients and clinical situations to the right visit modality, along with individual patient technology support could reduce virtual access disparities.

Trial registration: NA

Article Summary

Strengths and Limitations of the study:

1. Primary qualitative data collection from patients and care providers in the same clinical catchment area.
2. Data collection centered on a historically under-resourced population to promote equitable clinical algorithm development.
3. Stakeholder engagement in data collection tool development.
4. Iterative development of clinical algorithm rooted in current clinical practice to facilitate readiness for implementation.
5. Data collected from one geographic area and one health care system which may not translate to other regions or clinical settings.
6. Data collected from Black veterans living in rural areas only and may not represent the experiences of other marginalized patient populations.
7. Focus groups were conducted virtually which may have limited the participation of some individuals.

Introduction

The optimal role of video visits within primary care is undefined. With the onset of COVID-19, the need to stem potential viral transmission led to dramatic and rapid shifts from in-person to virtually-delivered care, including video-based care. Video offers assessment and communication advantages not possible with phone alone (e.g., visualizing a rash), may support better patient-provider rapport building [1], and receives higher remuneration from private insurers [2]. However, video-based care comes with distinct challenges for clinical teams (e.g., new clinic workflow) and patients (e.g., device access, technical literacy). In the absence of clear evidence, there is an urgent need to identify the right telehealth modality for the right clinical problem for the right patient at the right time [3].

Finding the optimal role for virtual primary care is particularly critical for historically marginalized and under-resourced populations. While telephone-delivered care may increase access to care[4], early findings show that when compared to phone-based care, systemically disadvantaged populations (e.g. older adults, those in rural or low bandwidth areas, racial and ethnic minorities, unhoused individuals) are less likely to engage in video visits [5] [6]. Compared to phone, access disparities were more pronounced with video visits due to requirements for digital literacy, higher cost, camera-ready phones or computers, and access to adequate bandwidth [5] [7] [8] [9] [10]. These findings underscore the structural determinants of telehealth disparities, including structural racism and unequal access to the internet [11] [12]. Addressing inequitable engagement in virtual care and related access disparities requires action at multiple levels from national policy to individual clinic practices.

Our objective was to develop a clinical algorithm to guide when and how to incorporate video visits into primary care delivery. For this algorithm to support equitable video visit access, we focused our data collection on patients who have historically experienced systemic healthcare access limitations. As the largest provider of US primary care and a national telehealth leader, the Department of Veterans Affairs Health Care System (VA) is an optimal setting to examine how to optimize virtual care delivery. Thus, we engaged populations at increased risk for low video uptake, specifically rural, Black veterans [6] [8] [13]

Materials and Methods

Data collection occurred among patients and clinical team members of VA outpatient primary care clinics in the Piedmont area of North Carolina which serve large populations of rural dwelling individuals. All study activities were reviewed and approved by the Durham VA Health Care System Institutional Review Board (IRB #02312). We followed COREQ guidelines for reporting of qualitative research where applicable [14].

Framework: We anchored our approach on the conceptualization of access developed by Fortney and colleagues [15]. This model emphasizes actual and perceived access to virtual and in-person care and guided our data collection materials (e.g., interview guides, matrix analysis, structured note templates), eligibility criteria (e.g., users, non-users), and debriefing sessions among the research team.

Setting: We defined rurality using Rural-Urban Communicating Areas (RUCA) consistent with the VA Office of Rural Health [16]. At the time of data collection, all clinics were providing in-person, telephone-based, and video-based care, though virtual

care, including video-based care, was encouraged across the VA health care system due to the pandemic [17]. While there was some flexibility on use of approved commercially available video-conference platforms during the early pandemic, the VA primarily uses an internal VA platform for video-based care delivery.

Patients: We conducted 26 semi-structured interviews with veterans who were identified as Black in the electronic health record, who were engaged in VA health care (i.e., ≥ 1 primary care visits within the prior 12 months) and lived in rural areas. Recruitment was stratified by patients who had completed at least one video-based primary care encounter (n=14) and those who had not (n=12). The research team contacted a subset of potential participants via mailed letter in batches of 25 with purposive sampling of Black veterans living in rural areas and then followed up by phone until the target recruitment number was obtained and thematic saturation was reached. We obtained verbal consent.

All interviews were conducted and recorded via WebEx (audio-only) between February-May 2021 by a study team member (KP) who identifies as white and has training in qualitative methodology. The interviewer listened to audio recordings and took templated notes. To ensure reliability and validity, a second study team member (AL, KG, LZ, MSB, CW) independently listened to interviews, reviewed, and amended interviewer notes. Responses to each domain were summarized using matrix analysis for participants stratified by previous video visit experience. Summary responses were generated independently by two team members and reviewed by a third reviewer.

Patient and Public Involvement: The driving question for this project was developed in response to trends in patient utilization of video-based care and the need to obtain

patient preferences and experiences directly from the patients themselves. We received consultation on our approach from the Durham VA Veteran Engagement Panel and the Durham VA Health Care System Antiracism and Black Equity Advisory Board; however, these individuals were not directly involved in the conduct of this work.

Primary Care Teams: We invited all primary care team members from three VA primary care clinics serving a single facility in the Piedmont area of North Carolina which cares for a large population of Black, rural-dwelling population to participate in clinic specific focus groups. We conducted four video-based focus groups across these three clinics between December 2020 and February 2021 using WebEx video-conferencing platform. Participants were encouraged to turn on their cameras if available and to make use of the chat function. Focus groups were first given the opportunity to review and provide feedback on a process map [18], an explicit step-by-step illustrative flow diagram of a proposed approach to the incorporation of video-visits into primary care based on existing workflow in our institution (see Appendix 1). Discussions followed the focus group guide. Research team members (n=3) took notes during focus groups using structured templates. A rapid qualitative approach and matrix method were used to identify focus group themes [19] [20] [21]. Notes from the structured templates were consolidated into matrices consistent with Fortney model domains. This matrix analysis approach was paired with real-time iterative team-based analysis [22]. A subgroup of team members (KP, KG, CW, AL, MSB, LZ) met virtually during data collection to review domain level findings and identify implications for primary care video-based care delivery.

Virtual care algorithm generation: We based the initial algorithm structure on our proposed process map of virtual care incorporation into primary care workflow (Appendix 1) and standards for clinical algorithm development [23]. Working from themes identified through patient interviews and clinical team focus group findings, we evaluated potential overlap, conflict, and novelty related to needs and preferences for when video-based visits are acceptable. After prioritizing patient safety and clinical appropriateness, we reorganized the preliminary clinical algorithm to explicitly include patient choice and preferences and to ensure their formal incorporation into clinic workflow. (Figure 1). For example, from clinical focus groups, we added an initial step to identify patients whose clinical characteristics would be more appropriate for a face-to-face visit regardless of patient preference (e.g., patients with cognitive impairment). Another example is adding assessment of patient preference for visit modality and need for technical assistance as an explicit step before scheduling. This was based on patient interview findings that there was great dissatisfaction when modality was assigned rather than offered, and that the need for technical assistance was often a significant barrier for patients. Our research team iteratively revised the algorithm and offered clinical team focus group participants the opportunity to review it. Ultimately, our novel algorithm seeks to guide whether video or an in-person care should be offered to a specific patient with a given clinical situation, and informed by their existing technical skills and equipment.

Results

Focus group participants included physicians, advanced-practice providers, administrative staff members, and nurses (n=38). Eleven of the 24 individuals who had

video visit experience reported receiving help to participate in the visit (Table 1).

Demographics of the interviewed patients are consistent with this patient population.

Table 1. Characteristics of Patients Participating in Semi-structured Interviews

	Prior Video Visit N = 14	**No Prior Video Visit N = 12**
Age, mean (SD)	64.50 (SD 9.00)	69.08 (8.69)
Gender*		
Male	11	12
Female	3	-
Tech self-efficacy †	Mean=4	Mean=4.29
<3	2	2
3-5	12	9
VA primary healthcare source		
Yes	11	11
No	-	1
Not sure	3	1
Distance to closest VA		
0-20 miles	4	5
21-80 miles	9	6
missing	1	1
No. prior video visits		
0 visits	-	12
1 visit	2	-
2-10 visits	7	-
>10 visits	5	-
No. prior telephone visits		
0 visits	2	2
1 visit	-	-
2-10 visits	7	10
>10 visits	5	-
Received help for video visit		
Yes	11	1
No	2	10
Not sure	1	1
Device used for video visit		
iPhone	5	-
Android phone	5	-
Tablet	2	-
Laptop or computer	2	-
Don’t have any devices to use	0	-
Reliable broadband		
Yes	11	6
No	1	5

Not sure	2	1
Reliable device		
Yes	12	9
No	2	2
Not sure	0	1
Racism in health care (M across items, SD, # of respondents) ‡	2.80 (1.17) for n=11	3.02 (0.72) for n=10
Endorsed Agreement with:		
RHC 1: Doctors treat African American and White people the same. (N, %, # respondents)	2 (18.2%) of 11	7 (58.3%) of 12
RHC 2: Racial discrimination in telehealth is common. (N, %, # respondents)	6 (50.0%) of 12	5 (50.0%) of 10
RHC 3: In most hospitals, African American and Whites receive the same kind of telehealth care. (N, %, # respondents)	5 (41.6%) of 12	4 (36.4%) of 11
RHC 4: African Americans can receive the telehealth care they want as equally as White people can. (N, %, # respondents)	5 (38.5%) of 13	4 (36.4%) of 11
Personal discrimination scale (M across items, SD) §	2.01 (0.75)	1.98 (0.77)
Endorsed Experiencing:		
PDS 1: Treated with less courtesy than other people? (N, %, # respondents)	10 (71.4%) of 14	6 (60.0%) of 10
PDS 2: Treated with less respect than other people? (N, %, # respondents)	11 (78.6%) of 14	7 (70.0%) of 10
PDS 3: Received poorer services than other people? (N, %, # respondents)	9 (69.2%) of 13	7 (70.0%) of 10
PDS 4: Had a doctor or nurse act as if he or she thinks you were not smart? (N, %, # respondents)	6 (42.9%) of 14	3 (30.0%) of 10
PDS 5: Had a doctor or nurse act as if he or she was afraid of you? (N, %, # respondents)	4 (28.6%) of 14	5 (50.0%) of 10
PDS 6: Had a doctor or nurse act as if he or she was better than you? (N, %, # respondents)	9 (64.3%) of 14	5 (55.6%) of 9
PDS 7: Felt like a doctor or nurse was not listening to what you were saying? (N, %, # respondents)	11 (78.6%) of 14	7 (70.0%) of 10
Telehealth satisfaction scale (M across items, SD, # of respondents)	1.83 (0.49) for n=13	2.02 (0.19) for n=9

*****as identified in chart

† Measure by response to the following question: How confident are you that you can complete the steps necessary that you identified above to attend a video visit with your provider on a scale of 1-5? One participant in the No prior Video Visit group did not provide an answer for this question.

‡ Racism in Healthcare measure (Hausmann et al[24]) agreement defined as marking “agree” or “strongly agree.” Average score computed with item 2 reverse coded; range of possible score by question 1-5 with 1 = strongly disagree and 5 = strongly agree

§ Personal discrimination scale adapted from Everyday discrimination scale[25]; endorsement marked by any response other than “Never” for all questions; range of possible score by question 1-5 with 1 = never and 5 = always

Telehealth Satisfaction Scale (TeSS [17])[26] is a 10-item measure with with range of possible score by question from 1 to 3 with 1 = "excellent" and 3 = "Poor/fair".
Scale scores for RHC, PDS, and TeSS only computed when all items were answered.
Patient interviews lasted from 25-45 minutes and focus groups from 45-60 minutes.

Below, we present themes from patients and clinical team data collection (Table 2).

Patient Findings

Perceived access to care: Most patients did not report personally experiencing or witnessing others receiving differential access to care due to personal identity. However, several patients noted differential treatment around receipt of benefits, pain medication, and appointment scheduling: "*…All my life, from the service part all the way up to where [I am] today, I feel like I've had to fight for myself…"* (video-user). Reasons for differential treatment were attributed to characteristics such as age, racial identity, disability status, and/or a history of substance use disorder.

Patients commonly reported challenges to video-based visits due to having inadequate technical skills or a lack of access to needed equipment/broadband. Only half of patients who had successfully completed video-based visits previously felt confident in their ability to access video-based care in the future. For patients who did feel confident, having a successful first video visit experience was reassuring. Among those without a prior video visit, there were varying degrees of confidence: "*I've never used a computer, so I'm a little shaky of it, you understand?.... because if I get the thing and I don't know how to use it, that's not worth a nickel…You hit one wrong button and you're out of business*" (video non-user).

Satisfaction with care: Patients expressed multiple concerns about receiving care by video. First, patients commonly reported perceptions that video visits were of lower

quality and more impersonal compared to in-person: "*Face to face makes it feel that I matter, that I'm important to the provider" (*video-user*)*. Second, patients with and without prior video visits noted concerns about a provider's ability to adequately assess medical concerns via video: "*They can't make medical decisions without seeing you in the face, looking at your body"* (video-user). Third, many patients reported completing telephone-based visits and generally perceived phone-based visits to be lower quality than either in-person or video: "*it is hard to know on* [the] *phone [what the provider] is doing, whether they're listening to you or understanding what you are saying. I'd prefer in-person visits, but video would be the next best thing" (*video non-user*)*. Finally, patients wanted to choose whether to have their primary care encounter in-person or via video. Many patients reported being told that their visit would occur via video rather than being offered a choice. Some patients who had not completed video-based visits thought that they might feel more relaxed and less rushed at home: "*Very convenient if I'm going to stay on top of my health" (*video non-user*)*.

Preferences for care: While patients acknowledged the potential convenience of video-based care, most individuals still preferred in-person: "*given the conditions we face today* [*COVID-19 pandemic*]*, I understand it. But my preference is in the office*" (video non-user). Reasons given for this preference centered on the full experience of in-person care: *"If it was up to me, I'd go to the VA. It is a form of release for me…It's a way for me to get out of the house"* (video-user). In-person care also was noted to offer better eye contact, rapport building, communication, physical exam, and the opportunity to coordinate care. The majority of patients thought visit modality should be tied to clinical need. Most veterans preferred video for mental health, while in-person was

preferred for specific conditions, such as pain or urgent concerns. This preference appears to be related to a sense that either the provider could not fully evaluate the patient remotely or the patient could not fully communicate their concerns when not face-to-face: "*They can see what's going on and know if you're having any difficulties. On video, you have to stay in one position, they don't know how you feel, you're just talking…in person, they can tell if you're not genuine" (*video-user*)*.

Clinical team member findings

Perceived access to care: Clinical teams noted that digital connectivity issues frequently present problems for accessing care. Specifically, video platform malfunctions consume significant visit time. Additionally, many providers were unsatisfied with available technology for video visits. Team members noted a diminished interpersonal connection during video-based visits and that sometimes both parties (patients and clinicians) were distracted or not fully engaged. Difficulty engaging with certain patients via video was particularly problematic – specifically those with cognitive, significant sensory, or functional impairments. One strategy used to overcome technical barriers was having a family member or friend provide logistical support during a video visit. Overall, clinical teams reported that patients living in rural areas and older patients had the most difficulty engaging in video-based care due to limited availability of and comfort with technology.

Satisfaction with care: Clinicians felt that video visits were inadequate for certain situations and often scheduled without regard to clinical appropriateness of the modality. Management of chronic condition (e.g., hypertension) was given as a specific example that could be appropriate for video, as were dermatologic conditions, mental

health, and non-traumatic single joint pain. Clinical conditions not appropriate for video would include new patient visits, patients with cognitive impairment, or new conditions.

Preferences for care: Clinicians expressed frustration when video-based care did not align with the patient's clinical problem. In addition, teams noted a significant need for streamlining the clinic workflow process which was felt to be designed for in-person visits and not conducive to virtual care. For example, due to in-person clinic demands, no one contacts patients in advance to verify that they have a working link for the video visit and that they are 'checked-in' online before an appointment.

Clinical algorithm

We identified three key decision points for matching a specific patient to a particular modality for an encounter. First, it is important to determine if the patient and their health concerns are clinically appropriate for video; second, patients need to agree to video modality use; third, patients need to be assessed for readiness for video visits (e.g., having accessible technology, adequate technical skills). These decision points seem to be implied in the existing primary care processes, but were not explicit or consistently applied. We combined these decision points into one ready-to-implement algorithm to clearly link the importance of both clinical appropriateness and patient readiness. Initially, the algorithm prompts clinical consideration of the appropriateness of a patient's current clinical concern for visit modality type (see Figure 2). Once a patient situation is deemed clinically appropriate for video-based care, the algorithm then requires a patient's response regarding interest in video-based care. Note that the algorithm does not specify who is responsible for making this determination. This is because we anticipate that it could be managed by different clinical roles (e.g.,

physician, advanced practice provider, nurse care manager) depending on a given clinic's resources and capacity. If the patient is interested in a video visit, the algorithm proceeds to incorporate what equipment and technological support are needed in advance of the video appointment. Also identified through the integration of patient and clinical team findings were key patient video visit preparation steps (Table 3). Importantly, it is possible that the provider would determine that an in-person visit is still necessary after a video-based visit, though the expectation and goal would be for this to be rare.

Table 2. Clinician and patient experiences with primary care video visits

Domain	Patient	Clinical Team	Implications for clinical algorithm
Perceived access to video-based care	• Some experiences of differential treatment by personal identity in health care setting • Barriers: Technical skills and equipment, lack of confidence • Scheduling generally easy	• Video platform malfunctions take up valuable clinical time • Diminished interpersonal connection with patients • Not appropriate for patients with specific limitations (e.g. cognitive impairment, significant sensory impairment) • Rural dwelling and older adults had most difficulty accessing video visits • First video visit was the hardest • Family friends can be helpful	• Clinical team training to optimize interpersonal rapport via video • Clinical triage for video visit appropriateness • Offer all patients opportunity to practice video visits prior to scheduled appointment, especially before first visit • Encourage patient to recruit family/friends for assistance • Assess patient preparedness for video visit (including broadband access, equipment, technical literacy)
Satisfaction with video-based care	Negative aspects of video visits: • Impersonal • Inadequate for quality medical care • Providers distracted • Technical barriers Positive aspects of video visits: • More relaxed • Less rushed • Desired choice for visit modality	• Video inadequate for some clinical presentations • Video not appropriate for new patient visits	• Transparency with patients about when video is appropriate and why it is being offered • Use same approach regarding modality choice for all patients • Enlist technical support for troubleshooting • Establish a back-up plan for connection in advance of appointment (e.g. alternate video platforming, telephone) • Prepare patients for optimal engagement • Give patients choice of participating in video visit
Attitudes towards video-based care	• Many preferred in-person despite convenience of video • In-person care perceived as better than video	• Frustrated when modality choice made without consideration for clinical appropriateness	• Allow in-person as per patient preference • Adapt clinic team workflow to support multi-modality clinical care

	• Appeal of ritual of in-person care • Video not always best for patient needs	• Need for clinic workflows to adapt to virtual care requirements • Management of video-based visit needs should not fall solely on providers	• Interdisciplinary collaboration around video visit workflow

Table 3. Patient teaching points before a video visit

Patient Teaching Before Video Visit		
At Scheduling	In Advance of Visit	During a Visit
Explain when video visit is appropriate	Prepare for visit as you would an in-person visit	Limit distractions
Explain that clinical team will determine appropriateness	Join video platform at least 15 minutes early	Do not multi-task during visit (e.g., do not clean house)
Give patients a choice	Ensure visual and auditory privacy	Do not drive during video visit
	Recruit a family member to help	Be aware that your provider may at times not be making eye contact while looking at medical record on a second screen
	Create a back-up plan	

Discussion

We identified patient and primary care team experiences with video visits across key dimensions of telehealth access and used our findings to develop a novel algorithm to guide the incorporation of equitable video visits into primary care. Consistent with previous literature, we confirmed that clinicians have concerns about technology malfunction, inadequate technical support, and recognize the importance of having a family or friend available before and during a visit to assist with the patient's technology [27] [28] [29]. Our study provides new insight in virtual care use. We found that patients are concerned with quality of video-based care, prefer to have choice of visit modality, and place personal value on in-person experience despite convenience costs.

Our intention was to develop an algorithm that could support equitable access to virtual care; however, we did not identify a consistent pattern about which patients would prefer video-based care. Thus, we incorporated features intended to promote equity in access to video-based care: 1) emphasized the importance of using this algorithm with all patients to avoid implicit bias regarding who may or may not want a video visit and and/or need technological support; 2) underscored patient choice regarding visit modality when possible; 3) identified actions to promote optimal patient engagement during a video visit; and 4) recognized clinician behaviors that promote trustworthiness and transparency during video-based encounters. One concern raised by some veteran participants was that if a video-based visit was completed and that either the patient or their provider wanted an in-person follow-up visit, that the opportunity for that in-person visit might be lost. In fact, one type of visit does not preclude the other. While clinical encounters that are conducted virtually may later require an in-person evaluation (e.g., due to patient preference or change in clinical indication), it is unknown how frequently this is likely to occur. Also unknown is the optimal timing and frequency of an in-person follow-up visit after video-based care. As this has important implications the patient experience, patient outcomes, and health system resource use, exploration of this outcome will be important for future research. In addition, we acknowledge that there are other existing approaches for choosing visit modality[30]. However, existing guides generally have not systematically incorporated the patient perspective in visit modality choice[31] [32]. Our algorithm purposively centers on the patient, as well as on the patient-provider dyad, through careful consideration of a patient's preferences and their experiences with telehealth, particularly tailored to patients from historically under-

resourced populations. This is a population who have traditionally suffered from inequities in access to traditional in-person care and are at risk for similar challenges in accessing video-based care. Our algorithm proactively addresses this at a time when video-based care is on a precipitous rise.

We also identified that both patients and clinicians expressed concerns about the impact of video visits on patient-provider relationship and subsequent clinical care quality. In particular, patients expressed misgivings about quality of care received via video. While the importance of patient confidence in virtual care has been previously noted [33] [34], our study adds that this may not be true for all types of care or at all points in the care continuum. Similar to patients, clinicians commonly described concerns about the interpersonal quality of virtual clinical interactions, especially around building rapport with new patients [35] and loss of body language and social cues [36] [37]. Strategies to improve the virtual care experience including improving accessibility through access to closed captioning and language interpretation [38], incorporation of trauma-informed care principles such as transparency during visit actions and maintaining good eye contact [38] [39], and adequate technology training for patients and clinical teams [27] [40]. Together with previous findings, our work points to the need for an intentional approach to the implementation of high-quality, equitable, patient-centered video-based care.

This research has limitations. First, our clinical support algorithm was informed by qualitative data from clinical teams in rural North Carolina and Black veterans residing in rural areas. However, it may be applicable to other rural, minoritized patients using virtual care in other health care systems with similar reimbursement pressures. Second,

we focused on the context of primary care and, thus, the algorithm may not be relevant to specialty care. For example, specialty clinics typically provide care for individual conditions or organ systems for which it may be easier to predict clinical appropriateness of video-based care. Third, we focused this algorithm on the choice between video-based visits vs care delivered in-person because health care system and insurance reimbursement policies have generally favored video-based care and not phone-based care. We acknowledge that telephone-based care has been recognized as an important modality for maintaining access to care, especially for patients with limited access to broadband services. However, as our work focused on video versus face-to-face care based on what services were anticipated to remain reimbursable post-pandemic, we did not collect data about how and when phone should fit into visit modality decisions. Within the VA health care system, there is no differential reimbursement for telephone-based care, video-based care, and in-person care. This may limit generalizability of our algorithm into other health care systems that may have a financial driver that could usurp patient and/or provider preference. Fourth, the interviewer for both the focus groups and the patient interviews identifies as white, which may have influenced participant willingness to disclose racial discrimination experiences. Our center has made a focused effort to hire and train diverse qualitative staff since the conclusion of this work. Finally, determinants of access to health care expand beyond clinic level policies and actions thus broader innovation and changes will be required to address access disparities.

Conclusions

Optimal and equitable incorporation of video visits into primary care delivery requires thoughtful planning and potential re-working of clinic workflow. Assessment of clinical appropriateness of a virtual modality as well as patient preference and technological readiness are crucial before each visit. Next steps for this work include evaluating the feasibility of our algorithm in a primary care practice and validating measures to assess patient interest in video visits. It will be critical to identify determinants of video visit uptake and areas needing adaptation for site specific characteristics. Informed matching of patients and clinical situations to the right visit modality, along with individual patient technology support, could contribute to broader virtual access disparities.

Figure Legend

Figure 1. Algorithm Development Process

Figure 2. Clinical Support Algorithm for Incorporation of Video Visits into Primary Care Workflow

Appendix. Process Map of Pre-existing Primary Care Workflow for Incorporation of Video-Based Care

Prior Presentations: Partial findings from this project were presented at the 2021 Dissemination and Implementation Virtual Conference.

Contributorship Statement: KMG co-conceptualized this project, participated in data collection, analysis and interpretation, and drafted this work; KRP developed data collection and analysis plan, collected the data, contributed to analysis, and edited the

manuscript; AL, CW, and MSB participated in data collection, analysis and interpretation, and edited the manuscript; HBB contributed to conceptualization, interpretation, and edited this manuscript. HW supported data collection and analysis and edited this manuscript; DVB contributed to data analysis, interpretation and edited this manuscript. LLZ co-conceptualized this project, participated in data collection, analysis and interpretation, and drafted this work.

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Ethics Statement: This work was reviewed and approved by the Durham VA Institutional Review Board. All co-authors declare no conflicts of interest.

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Patient seeking primary care clinical visit

Initiate Clinical Triage

- Does patient require urgent, in-person evaluation *(eg, altered mental status, difficulty breathing, chest pain)?*

Yes → Refer for emergent care 

No

Consider Patient Factors

- Is patient new to clinic/provider?
- Does the patient have cognitive impairment?
- Does patient have sensory impairment *(significant hearing loss or visual impairment*)?

Yes → Schedule in-person visit 

No

Continue Clinical Triage

- Is the patient's concern a chronic medical issue*?*
- Has the patient's concern been identified as appropriate for video-based evaluation (see inset box below)?

No → Schedule in-person visit 

Yes

Assess video access and interest

- Is patient interested in conducting visit by video?
- Does patient have video-capable equipment?
- Does patient have access to high-speed internet or broad band?
- Does patient have access to location with auditory and visual privacy?

No → Schedule in-person visit 

Yes

Assess need for technical assistance

- Has patient successfully completed a previous video-based visit on current platform?
- Does patient have family or friends that could assist with technology?

Yes → Schedule video visit 

No

Schedule for video-based visit **and** encourage patient to conduct test video-visit call 

Examples of conditions likely appropriate for video-based care:

- Chronic diabetes or hypertension management
- New rash
- Single joint, non-traumatic pain
- Follow up from urgent care for low complexity issues

Patients
Semi-structured Interviews

Purpose:

- Obtain patient experiences and perceptions of video-based primary care
- Center data collection on patient population which has historically experienced systemic healthcare access barriers

Participants

Rural-dwelling, African-American veterans with at least one primary care visit in the last 12 months

Questions guided by:

Fortney conceptualization of access to care (e.g., perceived access to care, satisfaction with care)

Overall goal:
To develop an equitable, patient/clinician centered algorithm to optimize the use of video-visits in primary care

- Integration of findings from both samples with direct implications for when and how to incorporate video visits into primary care delivery
- Findings were organized across common themes and compared to identify ideal balance across patient/clinician perspectives of use of video visits.
- Development and iterative review of algorithm building on existing clinic workflows

Developed algorithm to support incorporation of video visits into primary care delivery

Primary Care Team
Focus Groups

Purpose:

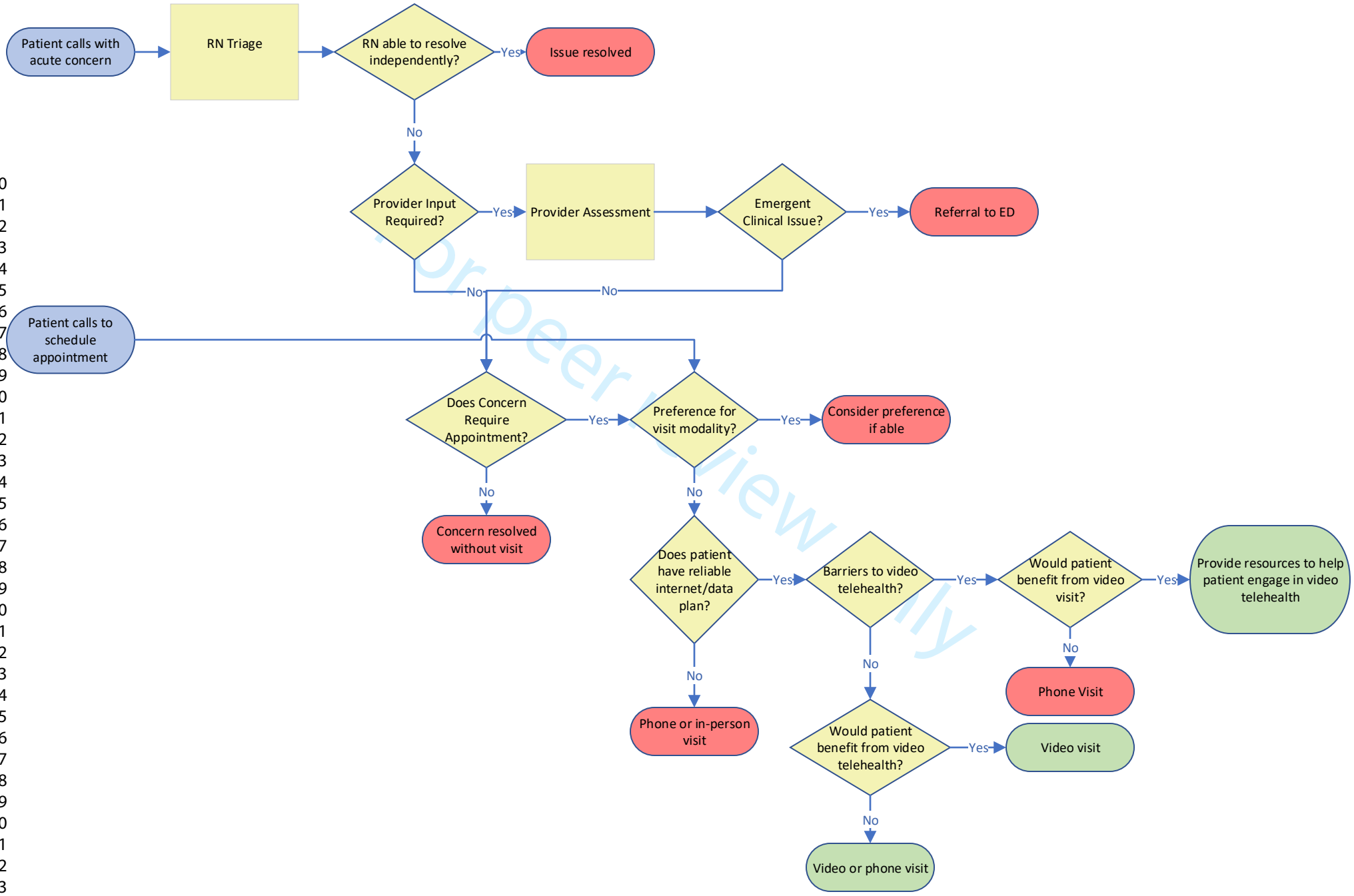
- Obtain clinical team experiences and perceptions of delivery care via video-visits
- Solicit clinically appropriate role for and incorporation of video visits in primary care delivery

Participants

Multi-disciplinary primary care team members serving large rural population in the Southeastern US

Questions guided by:

Process map of existing workflow for video visits; Fortney conceptualization of access to care (e.g., digital connectivity, quality of interpersonal experience)



Appendix 1. Process Map of Pre-existing Primary Care Workflow for Incorporation of Video-based Care
Developed by CW building from experience with local quality improvement telehealth projects

Standards for Reporting Qualitative Research (SRQR)*

http://www.equator-network.org/reporting-guidelines/srqr/

	Page/line no(s).
Title and abstract	
Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	1
Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	2-3
Introduction	
Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	4-5
Purpose or research question - Purpose of the study and specific objectives or questions	5
Methods	
Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	5-7
Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	6
Context - Setting/site and salient contextual factors; rationale**	6
Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**	6-7
Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	5
Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	6-7

Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	6-7
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	6-7
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	6-8
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	6-8
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	5-7

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	8-11
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	Table 1 & 2

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	12-15
Limitations - Trustworthiness and limitations of findings	14

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	3
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	3

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
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How can equitable video visit access be delivered in primary care? A qualitative study among rural primary care teams and patients

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Title: How can equitable video visit access be delivered in primary care? A qualitative study among rural primary care teams and patients

Running Title: Clinical algorithm for video visit access

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Abstract:

Objective: The COVID-19 pandemic sparked exponential growth in video visit use in primary care. The rapid shift to virtual from in-person care exacerbated digital access disparities across racial groups and rural populations. Moving forward, it is critical to understand when and how to incorporate video visits equitably into primary care. We sought to develop a novel clinical algorithm to guide primary care clinics on how and when to employ video visits as part of care delivery.

Design: Qualitative data collection; 1 team member conducted all patient semi-structured interviews and led all focus groups with 4 other team members taking notes during groups

Setting: 3 rural primary care clinics in the United States

Participants: 24 Black veterans living in rural areas and 3 primary care teams caring for Black veterans living in rural areas

Primary and secondary outcome measures: Findings from semi-structured interviews with patients and focus groups with primary care teams.

Results: Key issues around appropriate use of video visits for clinical teams included having adequate technical support, encouraging engagement during video visits, and using video visits for appropriate clinical situations. Patients reported challenges with broadband access, inadequate equipment, concerns about the quality of video care, the importance of visit modality choice, and preferences for in-person care experience over virtual care. We developed an algorithm that requires input from both patients and their care team to assess fit for each clinical encounter.

Conclusions: Informed matching of patients and clinical situations to the right visit modality, along with individual patient technology support could reduce virtual access disparities.

Trial registration: NA

Article Summary

Strengths and Limitations of the study:

1. Primary qualitative data collection from patients and care providers in the same clinical catchment area.
2. Data collection centered on a historically under-resourced population to promote equitable clinical algorithm development.
3. Partnered engagement in data collection tool development.
4. Data collected from one geographic area and one health care system may not translate to other regions or clinical settings.
5. Focus groups were conducted virtually which may have limited the participation of some individuals.

Introduction

The optimal role of video visits within primary care is undefined. With the onset of COVID-19, the need to stem potential viral transmission led to dramatic and rapid shifts from in-person to virtually-delivered care, including video-based care. Video offers assessment and communication advantages not possible with phone alone (e.g., visualizing a rash), may support better patient-provider rapport building [1], and receives higher remuneration from private insurers [2]. However, video-based care comes with distinct challenges for clinical teams (e.g., new clinic workflow) and patients (e.g., device access, technical literacy). In the absence of clear evidence, there is an urgent need to identify the right telehealth modality for the right clinical problem for the right patient at the right time [3].

Finding the optimal role for virtual primary care is particularly critical for historically marginalized and under-resourced populations. While telephone-delivered care may increase access to care [4], early findings show that when compared to phone-based care, systemically disadvantaged populations (e.g. older adults, those in rural or low bandwidth areas, racial and ethnic minorities, unhoused individuals) are less likely to engage in video visits [5] [6]. Compared to phone, access disparities were more pronounced with video visits due to requirements for digital literacy, higher cost, camera-ready phones or computers, and access to adequate bandwidth [5] [7] [8] [9] [10]. These findings underscore the structural determinants of telehealth disparities, including structural racism and unequal access to the internet [11] [12]. Addressing inequitable engagement in virtual care and related access disparities requires action at multiple levels from individual clinic practices to national policies.

Our objective was to develop a clinical algorithm to guide when and how to incorporate video visits into primary care delivery. For this algorithm to support equitable video visit access, we focused our data collection on patients who have historically experienced systemic healthcare access limitations. As the largest provider of US primary care and a national telehealth leader, the Department of Veterans Affairs Health Care System (VA) is an optimal setting to examine how to optimize virtual care delivery. Thus, we engaged populations at increased risk for low video uptake, specifically rural, Black veterans [6] [8] [13]

Materials and Methods

Data collection occurred among patients and clinical team members of VA outpatient primary care clinics in the Piedmont area of North Carolina which serve large populations of rural dwelling individuals. All study activities were reviewed and approved by the Durham VA Health Care System Institutional Review Board (IRB #02312). We followed COREQ guidelines for reporting of qualitative research where applicable [14].

Framework: We anchored our approach on the conceptualization of access developed by Fortney and colleagues [15]. This model emphasizes actual and perceived access to virtual and in-person care and guided our data collection materials (e.g., interview guides, matrix analysis, structured note templates), eligibility criteria (e.g., users, non-users), and debriefing sessions among the research team.

Setting: We defined rurality using Rural-Urban Communicating Areas (RUCA) consistent with the VA Office of Rural Health [16]. At the time of data collection, all clinics were providing in-person, telephone-based, and video-based care, though virtual

care, including video-based care, was encouraged across the VA health care system due to the pandemic [17]. While there was some flexibility on use of approved commercially available video-conference platforms during the early pandemic, the VA primarily uses an internal VA platform for video-based care delivery.

Patients: We conducted 26 semi-structured interviews with veterans who were identified as Black in the electronic health record, who were engaged in VA health care (i.e., ≥ 1 primary care visits within the prior 12 months) and lived in rural areas. Recruitment was stratified by patients who had completed at least one video-based primary care encounter (n=14) and those who had not (n=12). The research team contacted a subset of potential participants via mailed letter in batches of 25 with purposive sampling of Black veterans living in rural areas and then followed up by phone until the target recruitment number was obtained and thematic saturation was reached. We obtained verbal consent.

All interviews were conducted and recorded via WebEx (audio-only) between February-May 2021 by a study team member (KP) who identifies as white and has training in qualitative methodology. The interviewer listened to audio recordings and took templated notes. To ensure reliability and validity, a second study team member (AL, KG, LZ, MSB, CW) independently listened to interviews, reviewed, and amended interviewer notes. Responses to each domain were summarized using matrix analysis for participants stratified by previous video visit experience. Summary responses were generated independently by two team members and reviewed by a third reviewer.

Patient and Public Involvement: The driving question for this project was developed in response to trends in patient utilization of video-based care and the need to obtain

patient preferences and experiences directly from the patients themselves. We received consultation on our approach from the Durham VA Veteran Engagement Panel and the Durham VA Health Care System Antiracism and Black Equity Advisory Board; however, these individuals were not directly involved in the conduct of this work.

Primary Care Teams: We invited all primary care team members from three VA primary care clinics serving a single facility in the Piedmont area of North Carolina which cares for a large population of Black, rural-dwelling population to participate in clinic specific focus groups. We conducted four video-based focus groups across these three clinics between December 2020 and February 2021 using WebEx video-conferencing platform. Participants were encouraged to turn on their cameras if available and to make use of the chat function. Focus groups were first given the opportunity to review and provide feedback on a process map [18], an explicit step-by-step illustrative flow diagram of a proposed approach to the incorporation of video-visits into primary care based on existing workflow in our institution (see Appendix 1). Discussions followed the focus group guide. Research team members (n=3) took notes during focus groups using structured templates. A rapid qualitative approach and matrix method were used to identify focus group themes [19] [20] [21]. Notes from the structured templates were consolidated into matrices consistent with Fortney model domains. This matrix analysis approach was paired with real-time iterative team-based analysis [22]. A subgroup of team members (KP, KG, CW, AL, MSB, LZ) met virtually during data collection to review domain level findings and identify implications for primary care video-based care delivery.

Virtual care algorithm generation: We based the initial algorithm structure on our proposed process map of virtual care incorporation into primary care workflow (Appendix 1) and standards for clinical algorithm development [23]. Working from themes identified through patient interviews and clinical team focus group findings, we evaluated potential overlap, conflict, and novelty related to needs and preferences for when video-based visits are acceptable. After prioritizing patient safety and clinical appropriateness, we reorganized the preliminary clinical algorithm to explicitly include patient choice and preferences and to ensure their formal incorporation into clinic workflow (Figure 1). For example, from clinical focus groups, we added an initial step to identify patients whose clinical characteristics would be more appropriate for a face-to-face visit regardless of patient preference (e.g., patients with cognitive impairment). Another example is adding assessment of patient preference for visit modality and need for technical assistance as an explicit step before scheduling. This was based on patient interview findings that there was great dissatisfaction when modality was assigned rather than offered, and that the need for technical assistance was often a significant barrier for patients. Our research team iteratively revised the algorithm and offered clinical team focus group participants the opportunity to review it. Ultimately, our novel algorithm seeks to guide whether video or an in-person care should be offered to a specific patient with a given clinical situation, while incorporating consideration of the patient's existing technical skills and equipment.

Results

Focus group participants included physicians, advanced-practice providers, administrative staff members, and nurses (n=38). Twenty-four individuals completed

semi-structured interviews, 14 with and 12 without prior video visit experience. Demographics of the interviewed patients are consistent with the source patient population (Table 1).

Table 1. Characteristics of Patients Participating in Semi-structured Interviews

	Prior Video Visit N = 14	**No Prior Video Visit N = 12**
Age, mean (SD)	64.50 (SD 9.00)	69.08 (8.69)
Gender*		
Male	11	12
Female	3	-
Tech self-efficacy †	Mean=4	Mean=4.29
<3	2	2
3-5	12	9
VA primary healthcare source		
Yes	11	11
No	-	1
Not sure	3	1
Distance to closest VA		
0-20 miles	4	5
21-80 miles	9	6
missing	1	1
No. prior video visits		
0 visits	-	12
1 visit	2	-
2-10 visits	7	-
>10 visits	5	-
No. prior telephone visits		
0 visits	2	2
1 visit	-	-
2-10 visits	7	10
>10 visits	5	-
Received help for video visit		
Yes	11	1
No	2	10
Not sure	1	1
Device used for video visit		
iPhone	5	-
Android phone	5	-
Tablet	2	-
Laptop or computer	2	-
Don't have any devices to use	0	-
Reliable broadband		

Yes	11	6
No	1	5
Not sure	2	1
Reliable device		
Yes	12	9
No	2	2
Not sure	0	1
Racism in health care (M across items, SD, # of respondents) ‡	2.80 (1.17) for n=11	3.02 (0.72) for n=10
Endorsed Agreement with:		
RHC 1: Doctors treat African American and White people the same. (N, %, # respondents)	2 (18.2%) of 11	7 (58.3%) of 12
RHC 2: Racial discrimination in telehealth is common. (N, %, # respondents)	6 (50.0%) of 12	5 (50.0%) of 10
RHC 3: In most hospitals, African American and Whites receive the same kind of telehealth care. (N, %, # respondents)	5 (41.6%) of 12	4 (36.4%) of 11
RHC 4: African Americans can receive the telehealth care they want as equally as White people can. (N, %, # respondents)	5 (38.5%) of 13	4 (36.4%) of 11
Personal discrimination scale (M across items, SD) §	2.01 (0.75)	1.98 (0.77)
Endorsed Experiencing:		
PDS 1: Treated with less courtesy than other people? (N, %, # respondents)	10 (71.4%) of 14	6 (60.0%) of 10
PDS 2: Treated with less respect than other people? (N, %, # respondents)	11 (78.6%) of 14	7 (70.0%) of 10
PDS 3: Received poorer services than other people? (N, %, # respondents)	9 (69.2%) of 13	7 (70.0%) of 10
PDS 4: Had a doctor or nurse act as if he or she thinks you were not smart? (N, %, # respondents)	6 (42.9%) of 14	3 (30.0%) of 10
PDS 5: Had a doctor or nurse act as if he or she was afraid of you? (N, %, # respondents)	4 (28.6%) of 14	5 (50.0%) of 10
PDS 6: Had a doctor or nurse act as if he or she was better than you? (N, %, # respondents)	9 (64.3%) of 14	5 (55.6%) of 9
PDS 7: Felt like a doctor or nurse was not listening to what you were saying? (N, %, # respondents)	11 (78.6%) of 14	7 (70.0%) of 10
Telehealth satisfaction scale (M across items, SD, # of respondents)	1.83 (0.49) for n=13	2.02 (0.19) for n=9

*****as identified in chart

† Measure by response to the following question: How confident are you that you can complete the steps necessary that you identified above to attend a video visit with your provider on a scale of 1-5? One participant in the No prior Video Visit group did not provide an answer for this question.

‡ Racism in Healthcare measure (Hausmann et al[24]) agreement defined as marking “agree” or “strongly agree.” Average score computed with item 2 reverse coded; range of possible score by question 1-5 with 1 = strongly disagree and 5 = strongly agree

§ Personal discrimination scale adapted from Everyday discrimination scale[25]; endorsement marked by any response other than "Never" for all questions; range of possible score by question 1-5 with 1 = never and 5 = always

Telehealth Satisfaction Scale (TeSS [17])[26] is a 10-item measure with with range of possible score by question from 1 to 3 with 1 = "excellent" and 3 = "Poor/fair".

Scale scores for RHC, PDS, and TeSS only computed when all items were answered.

Patient interviews lasted from 25-45 minutes and focus groups from 45-60 minutes.

Below, we present themes from patients and clinical team data collection (Table 2).

Patient Findings

Perceived access to care: Most patients did not report personally experiencing or witnessing others receiving differential access to care due to personal identity. However, several patients noted differential treatment around receipt of benefits, pain medication, and appointment scheduling: "*…All my life, from the service part all the way up to where [I am] today, I feel like I've had to fight for myself…"* (video-user). Reasons for differential treatment were attributed to characteristics such as age, racial identity, disability status, and/or a history of substance use disorder.

Patients commonly reported challenges to video-based visits due to having inadequate technical skills or a lack of access to needed equipment/broadband. Only half of patients who had successfully completed video-based visits previously felt confident in their ability to access video-based care in the future. For patients who did feel confident, having a successful first video visit experience was reassuring. Among those without a prior video visit, there were varying degrees of confidence: "*I've never used a computer, so I'm a little shaky of it, you understand?.... because if I get the thing and I don't know how to use it, that's not worth a nickel…You hit one wrong button and you're out of business*" (video non-user).

Satisfaction with care: Patients expressed multiple concerns about receiving care by video. First, patients commonly reported perceptions that video visits were of lower quality and more impersonal compared to in-person: "*Face to face makes it feel that I matter, that I'm important to the provider" (*video-user*)*. Second, patients with and without prior video visits noted concerns about a provider's ability to adequately assess medical concerns via video: "*They can't make medical decisions without seeing you in the face, looking at your body"* (video-user). Third, many patients reported completing telephone-based visits and generally perceived phone-based visits to be lower quality than either in-person or video: "*it is hard to know on* [the] *phone [what the provider] is doing, whether they're listening to you or understanding what you are saying. I'd prefer in-person visits, but video would be the next best thing" (*video non-user*)*. Finally, patients wanted to choose whether to have their primary care encounter in-person or via video. Many patients reported being told that their visit would occur via video rather than being offered a choice. Some patients who had not completed video-based visits thought that they might feel more relaxed and less rushed at home: "*Very convenient if I'm going to stay on top of my health" (*video non-user*)*.

Preferences for care: While patients acknowledged the potential convenience of video-based care, most individuals still preferred in-person: "*given the conditions we face today* [COVID-19 pandemic]*, I understand it. But my preference is in the office*" (video non-user). Reasons given for this preference centered on the full experience of in-person care: *"If it was up to me, I'd go to the VA. It is a form of release for me…It's a way for me to get out of the house"* (video-user). In-person care also was noted to offer better eye contact, rapport building, communication, physical exam, and the opportunity

to coordinate care. The majority of patients thought visit modality should be tied to clinical need. Most veterans preferred video for mental health, while in-person was preferred for specific conditions, such as pain or urgent concerns. This preference appears to be related to a sense that either the provider could not fully evaluate the patient remotely or that the patient could not fully communicate their concerns when not face-to-face: "*They can see what's going on and know if you're having any difficulties. On video, you have to stay in one position, they don't know how you feel, you're just talking…in person, they can tell if you're not genuine" (*video-user*)*.

Clinical team member findings

Perceived access to care: Clinical teams noted that digital connectivity issues frequently present problems for accessing care. Specifically, video platform malfunctions consume significant visit time. Additionally, many providers were unsatisfied with available technology for video visits. Team members noted a diminished interpersonal connection during video-based visits and that sometimes both parties (patients and clinicians) were distracted or not fully engaged. Difficulty engaging with certain patients via video was particularly problematic – specifically those with cognitive, significant sensory, or functional impairments. One strategy used to overcome technical barriers was having a family member or friend provide logistical support during a video visit. Overall, clinical teams reported that patients living in rural areas and older patients had the most difficulty engaging in video-based care due to limited availability of and comfort with technology.

Satisfaction with care: Clinicians felt that video visits were inadequate for certain situations and often scheduled without regard to clinical appropriateness of the

modality. Management of chronic condition (e.g., hypertension) was given as a specific example that could be appropriate for video, as were dermatologic conditions, mental health, and non-traumatic single joint pain. Clinical conditions not appropriate for video would include new patient visits, patients with cognitive impairment, or new conditions.

Preferences for care: Clinicians expressed frustration when video-based care did not align with the patient's clinical problem. In addition, teams noted a significant need for streamlining the clinic workflow process which was felt to be designed for in-person visits and not conducive to virtual care. For example, due to in-person clinic demands, teams noted that often no one contacts patients in advance to verify that they have a working link for the video visit and that they are 'checked-in' online before an appointment.

Clinical algorithm

We identified three key decision points for matching a specific patient to a particular modality for an encounter. First, it is important to determine if the patient and their health concerns are clinically appropriate for video; second, patients need to agree to video modality use; third, patients need to be assessed for readiness for video visits (e.g., having accessible technology, adequate technical skills). These decision points seem to be implied in the existing primary care processes, but were not explicit or consistently applied. We combined these decision points into one ready-to-implement algorithm to clearly link the importance of both clinical appropriateness and patient readiness. Initially, the algorithm prompts clinical consideration of the appropriateness of a patient's current clinical concern for visit modality type (see Figure 2). Once a patient situation is deemed clinically appropriate for video-based care, the algorithm

then requires a patient's response regarding interest in video-based care. Note that the algorithm does not specify who is responsible for making this determination. This is because we anticipate that it could be managed by different clinical roles (e.g., physician, advanced practice provider, nurse care manager) depending on a given clinic's resources and capacity. If the patient is interested in a video visit, the algorithm proceeds to incorporate what equipment and technological support are needed in advance of the video appointment. Importantly, it is possible that the provider would determine that an in-person visit is still necessary after a video-based visit, though the expectation and goal would be for this to be rare. Also identified through the integration of patient and clinical team findings were key patient video visit preparation steps (Table 3).

Table 2. Clinician and patient experiences with primary care video visits

Domain	Patient	Clinical Team	Implications for clinical algorithm
Perceived access to video-based care	• Some experiences of differential treatment by personal identity in health care setting • Barriers: Technical skills and equipment, lack of confidence • Scheduling generally easy	• Video platform malfunctions take up valuable clinical time • Diminished interpersonal connection with patients • Not appropriate for patients with specific limitations (e.g. cognitive impairment, significant sensory impairment) • Rural dwelling and older adults had most difficulty accessing video visits • First video visit was the hardest • Family friends can be helpful	• Clinical team training to optimize interpersonal rapport via video • Clinical triage for video visit appropriateness • Offer all patients opportunity to practice video visits prior to scheduled appointment, especially before first visit • Encourage patient to recruit family/friends for assistance • Assess patient preparedness for video visit (including broadband access, equipment, technical literacy)
Satisfaction with video-based care	Negative aspects of video visits: • Impersonal • Inadequate for quality medical care • Providers distracted • Technical barriers Positive aspects of video visits: • More relaxed • Less rushed • Desired choice for visit modality	• Video inadequate for some clinical presentations • Video not appropriate for new patient visits	• Transparency with patients about when video is appropriate and why it is being offered • Use same approach regarding modality choice for all patients • Enlist technical support for troubleshooting • Establish a back-up plan for connection in advance of appointment (e.g. alternate video platforming, telephone) • Prepare patients for optimal engagement • Give patients choice of participating in video visit
Attitudes towards video-based care	• Many preferred in-person despite convenience of video • In-person care perceived as better than video	• Frustrated when modality choice made without consideration for clinical appropriateness	• Allow in-person as per patient preference • Adapt clinic team workflow to support multi-modality clinical care

	• Appeal of ritual of in-person care • Video not always best for patient needs	• Need for clinic workflows to adapt to virtual care requirements • Management of video-based visit needs should not fall solely on providers	• Interdisciplinary collaboration around video visit workflow

Table 3. Patient teaching points before a video visit

Patient Teaching Before Video Visit		
At Scheduling	In Advance of Visit	During a Visit
Explain when video visit is appropriate	Prepare for visit as you would an in-person visit	Limit distractions
Explain that clinical team will determine appropriateness	Join video platform at least 15 minutes early	Do not multi-task during visit (e.g., do not clean house)
Give patients a choice	Ensure visual and auditory privacy	Do not drive during video visit
	Recruit a family member to help	Be aware that your provider may at times not be making eye contact while looking at medical record on a second screen
	Create a back-up plan	

Discussion

We identified patient and primary care team experiences with video visits across key dimensions of telehealth access and used our findings to develop a novel algorithm to guide the incorporation of equitable video visits into primary care. Consistent with previous literature, we confirmed that clinicians have concerns about technology malfunction, inadequate technical support, and recognize the importance of having a family or friend available before and during a visit to assist with the patient's technology [27] [28] [29]. Our study provides new insight in virtual care use. We found that patients are concerned with quality of video-based care, prefer to have choice of visit modality, and place personal value on in-person experience despite convenience costs.

Our intention was to develop an algorithm that could support equitable access to virtual care; however, we did not identify a consistent pattern about which patients would prefer video-based care. Thus, we incorporated features intended to promote equity in access to video-based care broadly: 1) emphasized the importance of using this algorithm with all patients to avoid implicit bias regarding who may or may not want a video visit and and/or need technological support; 2) underscored patient choice regarding visit modality when possible; 3) identified actions to promote optimal patient engagement during a video visit; and 4) recognized clinician behaviors that promote trustworthiness and transparency during video-based encounters. One concern raised by some veteran participants was that if a video-based visit was completed and that either the patient or their provider wanted an in-person follow-up visit, that the opportunity for that in-person visit might be lost. In fact, one type of visit does not preclude the other. While clinical encounters that are conducted virtually may later require an in-person evaluation (e.g., due to patient preference or change in clinical indication), it is unknown how frequently this is likely to occur. Also unknown is the optimal timing and frequency of an in-person follow-up visit after video-based care. As this has important implications for the patient experience, patient outcomes, and health system resource use, exploration of impact of virtual care on overall healthcare utilization will be important for future research. In addition, we acknowledge that there are other existing approaches for choosing visit modality[30]. However, existing guides generally have not systematically incorporated the patient perspective in visit modality choice[31] [32]. Our algorithm purposively centers on the patient, as well as on the patient-provider dyad, through careful consideration of a patient's preferences and their

experiences with telehealth, particularly tailored to patients from historically under-resourced populations. This is a population which has traditionally suffered from inequities in access to traditional in-person care and is at risk for similar challenges in accessing video-based care. Our algorithm proactively addresses this risk at a time when video-based care is on a precipitous rise.

We also identified that both patients and clinicians expressed concerns about the impact of video visits on patient-provider relationship and subsequent clinical care quality. In particular, patients expressed misgivings about quality of care received via video. While the importance of patient confidence in virtual care has been previously noted [33] [34], our study adds that this may not be true for all types of care or at all points in the care continuum. Similar to patients, clinicians commonly described concerns about the interpersonal quality of virtual clinical interactions, especially around building rapport with new patients [35] and loss of body language and social cues [36] [37]. Strategies to improve the virtual care experience including improving accessibility through access to closed captioning and language interpretation [38], incorporation of trauma-informed care principles such as transparency during visit actions and maintaining good eye contact [38] [39], and adequate technology training for patients and clinical teams [27] [40]. Together with previous findings, our work points to the need for an intentional approach to the implementation of high-quality, equitable, patient-centered video-based care.

This research has limitations. First, our clinical support algorithm was informed by qualitative data from clinical teams in rural North Carolina and Black veterans residing in rural areas. However, it may be applicable to other rural, minoritized patients using

virtual care in other health care systems with similar reimbursement pressures. Second, we focused on the context of primary care and, thus, the algorithm may not be relevant to specialty care. For example, specialty clinics typically provide care for individual conditions or organ systems for which it may be easier to predict clinical appropriateness of video-based care. Third, we focused this algorithm on the choice between video-based visits vs care delivered in-person because health care system and insurance reimbursement policies have generally favored video-based care and not phone-based care. We acknowledge that telephone-based care has been recognized as an important modality for maintaining access to care, especially for patients with limited access to broadband services. However, as our work focused on video versus face-to-face care based on what services were anticipated to remain reimbursable post-pandemic, we did not collect data about how and when phone should fit into visit modality decisions. Within the VA health care system, there is no differential reimbursement for telephone-based care, video-based care, and in-person care. This may limit generalizability of our algorithm into other health care systems that may have a financial driver that could usurp patient and/or provider preference. Fourth, the interviewer for both the focus groups and the patient interviews identifies as white, which may have influenced participant willingness to disclose racial discrimination experiences. Our center has made a focused effort to hire and train diverse qualitative staff since the conclusion of this work. Finally, determinants of access to health care expand beyond clinic level policies and actions thus broader innovation and changes will be required to address access disparities.

Conclusions

Optimal and equitable incorporation of video visits into primary care delivery requires thoughtful planning and potential re-working of clinic workflow. Assessment of clinical appropriateness of a virtual modality as well as patient preference and technological readiness are crucial before each visit. Next steps for this work include evaluating the feasibility of our algorithm in a primary care practice and validating measures to assess patient interest in video visits. It will be critical to identify determinants of video visit uptake and areas needing adaptation for site specific characteristics. Informed matching of patients and clinical situations to the right visit modality, along with individual patient technology support, could contribute to broader virtual access disparities.

Figure Legend

Figure 1. Algorithm Development Process

Figure 2. Clinical Support Algorithm for Incorporation of Video Visits into Primary Care Workflow

Appendix. Process Map of Pre-existing Primary Care Workflow for Incorporation of Video-Based Care

Prior Presentations: Partial findings from this project were presented at the 2021 Dissemination and Implementation Virtual Conference.

Contributorship Statement: KMG co-conceptualized this project, participated in data collection, analysis and interpretation, and drafted this work; KRP developed data collection and analysis plan, collected the data, contributed to analysis, and edited the

manuscript; AL, CW, and MSB participated in data collection, analysis and interpretation, and edited the manuscript; HBB contributed to conceptualization, interpretation, and edited this manuscript. HW supported data collection and analysis and edited this manuscript; DVB contributed to data analysis, interpretation and edited this manuscript. LLZ co-conceptualized this project, participated in data collection, analysis and interpretation, and drafted this work.

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Data sharing statement: Reasonable requests for data will be responded to in accordance to current Department of Veteran Affairs policy.

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Ethics Statement: This work was reviewed and approved by the Durham VA Institutional Review Board (#02312). All co-authors declare no conflicts of interest.

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Patients
Semi-structured Interviews

Purpose:

- Obtain patient experiences and perceptions of video-based primary care
- Center data collection on patient population which has historically experienced systemic healthcare access barriers

Participants

Rural-dwelling, African-American veterans with at least one primary care visit in the last 12 months

Questions guided by:

Fortney conceptualization of access to care (e.g., perceived access to care, satisfaction with care)

Overall goal:
To develop an equitable, patient/clinician centered algorithm to optimize the use of video-visits in primary care

- Integration of findings from both samples with direct implications for when and how to incorporate video visits into primary care delivery
- Findings were organized across common themes and compared to identify ideal balance across patient/clinician perspectives of use of video visits.
- Development and iterative review of algorithm building on existing clinic workflows

Developed algorithm to support incorporation of video visits into primary care delivery

Primary Care Team
Focus Groups

Purpose:

- Obtain clinical team experiences and perceptions of delivery care via video-visits
- Solicit clinically appropriate role for and incorporation of video visits in primary care delivery

Participants

Multi-disciplinary primary care team members serving large rural population in the Southeastern US

Questions guided by:

Process map of existing workflow for video visits; Fortney conceptualization of access to care (e.g., digital connectivity, quality of interpersonal experience)

Patient seeking primary care clinical visit

Initiate Clinical Triage

- Does patient require urgent, in-person evaluation *(eg, altered mental status, difficulty breathing, chest pain)?*

Yes → Refer for emergent care

No

Consider Patient Factors

- Is patient new to clinic/provider?
- Does the patient have cognitive impairment?
- Does patient have sensory impairment *(significant hearing loss or visual impairment*)?

Yes → Schedule in-person visit

No

Continue Clinical Triage

- Is the patient's concern a chronic medical issue*?*
- Has the patient's concern been identified as appropriate for video-based evaluation (see inset box below)?

No → Schedule in-person visit

Yes

Assess video access and interest

- Is patient interested in conducting visit by video?
- Does patient have video-capable equipment?
- Does patient have access to high-speed internet or broad band?
- Does patient have access to location with auditory and visual privacy?

No → Schedule in-person visit

Yes

Assess need for technical assistance

- Has patient successfully completed a previous video-based visit on current platform?
- Does patient have family or friends that could assist with technology?

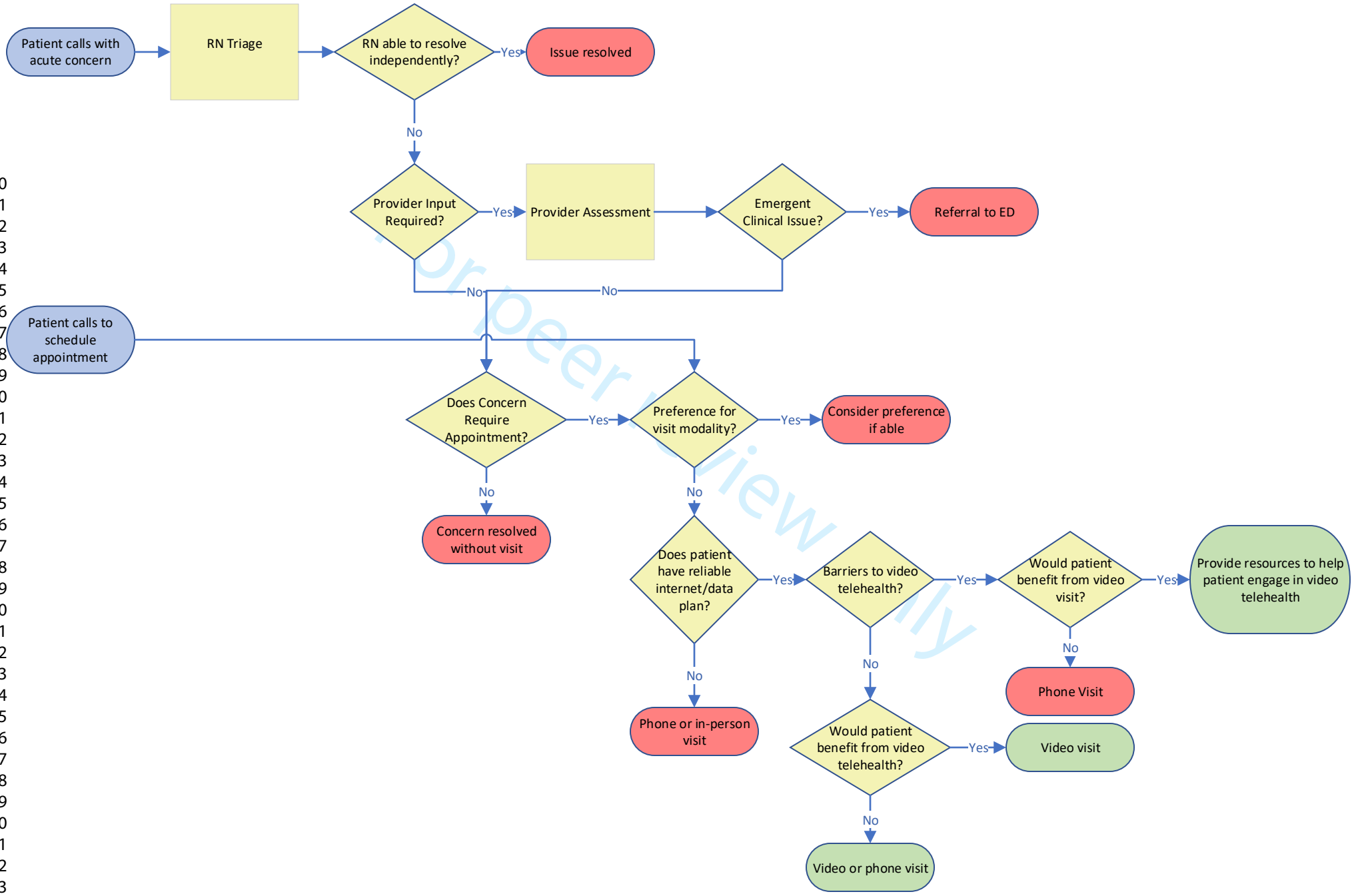
Yes → Schedule video visit

No

Schedule for video-based visit **and** encourage patient to conduct test video-visit call

Examples of conditions likely appropriate for video-based care:

- Chronic diabetes or hypertension management
- New rash
- Single joint, non-traumatic pain
- Follow up from urgent care for low complexity issues



Appendix 1. Process Map of Pre-existing Primary Care Workflow for Incorporation of Video-based Care
Developed by CW building from experience with local quality improvement telehealth projects

Standards for Reporting Qualitative Research (SRQR)*

http://www.equator-network.org/reporting-guidelines/srqr/

	Page/line no(s).
Title and abstract	
Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	1
Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	2-3
Introduction	
Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	4-5
Purpose or research question - Purpose of the study and specific objectives or questions	5
Methods	
Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	5-7
Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	6
Context - Setting/site and salient contextual factors; rationale**	6
Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**	6-7
Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	5
Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	6-7

Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	6-7
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	6-7
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	6-8
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	6-8
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	5-7

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	8-11
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	Table 1 & 2

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	12-15
Limitations - Trustworthiness and limitations of findings	14

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	3
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	3

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
DOI: 10.1097/ACM.0000000000000388