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## Abstract

During the COVID-19 pandemic, HIV clinics had to transform care delivery for people with HIV (PWH). We developed a multifaceted telehealth implementation strategy and monitored number of out of care patients (OOC), medical visit frequency (MVF), gap in care (GiC) and viral suppression (VS), and compared measures to baseline data. Between April and October 2020, 1559 visits were scheduled; 328 (21%) were missed, and 63 (4%) were new to care. Of the remaining 1168 follow-up visits, 412 (35%) were telehealth visits. As of October 2020, there were 53 patients OOC, MVF was 55% and GiC was 24% compared to 34, 69% and 14% at baseline, respectively. Overall VS rate remained high at 93% (97% for telehealth and 91% for in-person visits,  $p = 0.0001$ ). Our implementation strategy facilitated quick provision of telehealth to a third of PWH receiving care in our clinic. While MVF decreased and GiC increased, VS rates remained high.

## Keywords

telemedicine, HIV, COVID-19 pandemic, implementation science

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## Background

COVID-19 was declared a pandemic 1 year after the United States administration announced its “End the HIV Epidemic: A Plan for America” (EHE) initiative, with the goal of 75% reduction in new HIV infections by 2025 and at least 90% reduction by 2030.<sup>1</sup> One of the key strategies of the EHE initiative is to treat people with HIV (PWH) rapidly and effectively to reach viral suppression (VS). PWH who achieve sustained VS have improved health outcomes and do not transmit the disease to their sexual partners.<sup>2,3</sup> In addition, in one study, PWH with sustained VS had similar risk of COVID-19 severity and complications compared to those without HIV.<sup>4</sup> Retention in care (RiC) and antiretroviral therapy (ART) adherence are key factors in achieving sustained VS.<sup>5</sup> Therefore, it is imperative for HIV clinics to implement strategies to ensure RiC for PWH, particularly during the COVID-19 pandemic.

The University of Nebraska Medical Center Specialty Care Center (UNMC SCC) is the largest provider of comprehensive HIV care in Nebraska. The clinic provides primary and HIV-focused medical services as well as a wide range of support

services. Over the past 3 years, the SCC patients maintained a viral load suppression rate of 90% or greater, which exceeds the target set forth by the National HIV Strategy 2020 and the Joint United Nations Program on HIV/AIDS.<sup>6</sup> The objectives of this quality improvement project were to ensure successful implementation of telehealth services for PWH, while maintaining the clinic’s high VS rate during the COVID-19 pandemic.

## Methods

### *Clinic Operation Implementation Strategy*

We developed a multifaceted implementation strategy for SCC operation. In March 2020 we recognized the need to adjust SCC

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### What Do We Already Know about This Topic?

The COVID-19 pandemic has drastically altered the healthcare delivery system for clinics providing HIV care with many clinics transitioning rapidly to alternative methods such as telehealth.

### How Does Your Research Contribute to the Field?

Our quality management project demonstrates the benefit of screening patients for telehealth eligibility, and showed that these interventions can lead to maintenance of viral suppression rates despite decreases in visit frequency.

### What Are Your Research's Implications toward Theory, Practice, or Policy?

Telehealth is an effective modality for HIV care during health emergencies and should be incorporated into routine care delivery along with guidelines on implementation and outcome measures.

operations to promote patient and staff safety during the pandemic by limiting in-person interactions. This conflicted with our usual approach to RiC, which relied on frequent patient visits to the clinic not only for clinical care, but also for ongoing medication adherence and case management support.

As we recognized the need to transform SCC operations during the pandemic, our larger university healthcare system was rapidly developing policies and infrastructure to promote the transition to telehealth (defined as 2 way communication between patient and provider via either audio or video). The telehealth implementation strategy for the HIV clinic included: 1) assessment for readiness and identification of barriers and facilitators, 2) identification and preparation of telehealth champions, 3) organization of clinician implementation meetings, and 4) conduct of all necessary staff training.

We identified several barriers including patient access to technology, staff unfamiliarity with telehealth documentation, and wide variations in providers' criteria for who can receive a visit using telehealth. As a result, we developed an implementation blueprint that incorporated resolutions to these barriers.

To address the first barrier of patient access to technology, we opted to utilize telephone visits as the preferred telehealth modality. While many patients did not have access to video-enabled devices, they were able to participate in a telephone visit. We built templates in the electronic health record (EHR) and educated staff on how to change an in-person visit to telephone visit. We informed patients of the option to transition to telephone visits through outreach by clinic staff or when patients called to cancel their appointments due to concern of exposure to COVID-19.

Our immediate focus shifted to defining patient eligibility criteria for telephone visits. Clinic champions used decision trees to develop simple algorithms for new and established patients. These decision trees were based on date of most recent office visit, stability of HIV disease, most recent viral load and CD4 count, and ART refill histories as proxy of medication adherence. The algorithms incorporated referral to case management services, vaccination, and laboratory visits.

Once telephone visit eligibility criteria were formalized, we recognized the need for consistent and efficient EHR tools to document HIV management, capture criteria for billing, and incorporate prompts for COVID-19 screening, testing, and education. Clinic champions developed a Plan Do Study Act (PDSA) cycle to create and disseminate a progress note template for telephone visits that incorporated elements necessary for HIV care, billing and coding.

Clinician implementation meetings equipped providers with updated algorithms and progress note template. HIV clinic staff participated in trainings on telehealth, rescheduling of patients, proper use of personal protective equipment, SARS-CoV-2 swab collection, and physical distancing to safely accommodate patients who did not meet criteria for telehealth.

### Outcome Measures

We conducted a retrospective chart review to collect patient demographic information and outcomes of telehealth implementation for established patients who had a follow up visit between April and October 2020. Our primary outcome was VS defined as the percentage of patients with a most recent HIV RNA of <200 copies per mL. Our secondary outcomes included number of patients who were out of care (OOC) defined as patients whose most recent office visit was >12 months prior, and RiC as measured by medical visit frequency (MVF) defined by Health Resources and Services Administration HIV and AIDS Bureau (HRSA HAB) as percentage of patients who had one visit in each 6 months of the preceding 24 months with at least 60 days between visits; and gap in care (GiC) defined as the percentage of patients who had no visit in the preceding 6 months. We selected these RiC measures based on HAB core measures.<sup>7</sup> These outcomes were compared to pre-pandemic baseline outcomes as of February, 2020. Descriptive statistics were used to summarize the data. A chi square test was used to compare viral suppression rate in patients who received telephone visits to those who received in person visits.

### Ethical Approval and Informed Consent

The study was deemed exempt under the 45 CFR 46:104 (d), category 4 by the UNMC Institutional Review Board (IRB # 681-20-EX)

### Results

A total of 1559 visits were scheduled between April 1 and October 30, 2020; 328 (21%) were missed, and 63 (4%) were

**Table 1.** Demographic and Clinical Characteristics of Patients Who Received Telemedicine vs. in-Person Visits.

	In person visit (N = 755)	Telemedicine visit (N = 412)	All follow ups (N = 1,167)
Age (Years)			
Median [Min, Max]	47[19,84]	51[21,77]	48[19,84]
Gender			
Female	182 (24.1%)	94 (22.8%)	276 (23.7%)
Male	565 (74.8%)	313 (76%)	878 (75.2%)
Transgender	8 (1.1%)	5 (1.2%)	13 (1.1%)
Race			
Asian	28 (3.7%)	8 (1.9%)	36 (3.9%)
Black or African American	235 (31.1%)	116 (28.2%)	351 (30.1%)
Other races	35 (3.4%)	10 (2.5%)	45 (3.9%)
White or Caucasian	457 (60.5%)	278 (67.5%)	735 (63%)
Ethnicity			
Hispanic or Latino	125 (16.5%)	63 (15.3%)	188 (16.1%)
Not Hispanic or Latino	629 (83.3%)	348 (84.5%)	977 (83.7%)
Percent federal poverty level			
<100%	251 (33.2%)	129 (31.3%)	380 (32.6%)
100-200%	184 (24.4%)	83 (20.1%)	267 (22.9%)
201-300%	133 (17.6%)	81 (19.7%)	214 (18.3%)
301-400%	58 (7.7%)	35 (8.5%)	93 (8%)
>400%	28 (3.7%)	11 (2.7%)	39 (3.3%)
Missing	101 (13.4%)	73 (17.7%)	174 (15%)
Housing status			
Incarcerated	1 (0.1%)	2 (0.5%)	3 (0.3%)
Non-permanent housing	38 (5%)	19 (4.6%)	57 (4.9%)
Stable/permanent	714 (94.6%)	391 (95%)	1105 (94.7%)
Viral suppression (HIV RNA < 200 copies/mL)			
No	66 (8.7%)	12 (2.9%)	78 (6.7%)
Yes	688 (91.1%)	399 (96.8%)	1087 (93.1%)
Last CD4 cell count (cells/mm <sup>3</sup> )			
Mean (SD)	619.4 (345.3)	679 (347.1)	639.4 (346.8)
Median [Min, Max]	568.5[24-2368]	629.5[84-2374]	591.5[24-2374]

new patient visits, which were excluded from the analysis. Of the remaining 1167 established patient visits, 412 (35%) were telephone visits. Table 1 outlines the demographic characteristics of established patients who received in-person visits compared to those who received telephone visits. There were no differences in age, gender, race, or ethnicity between the 2 groups. The majority of patients had stable permanent housing (95% for both telephone and in-person visits) and 33% of patients lived at or below 100% of the federal poverty level (31% for telephone and 33% for in person visit). Median CD4 count (Min-Max) was 592 (24-2374) cell/mcL; [568 (24-2368) cell/mcL for telephone and 569 (24-2368) cell/mcL for in-person visits]. Overall VS rate remained high at 93% with higher VS rates in PWH who received telephone: 97% (1087/1165) vs. those who received in-person visit 91% (688/754); p value = 0.0001.

By the end of October 2020, there were a total of 53 patients OOC compared to 34 patients at pre-pandemic baseline. Our MVF decreased to 55% (492/899) compared to 69%, and our GiC increased to 24% (217/911) compared to 14% at pre-pandemic baseline.

## Discussion

We successfully provided telehealth services in the form of telephone visits to 35% of PWH receiving care at UNMC SCC during the first 7 months of the COVID-19 pandemic. Our paper details the steps we took to transition PWH from in-person visits to telehealth using a comprehensive implementation strategy taking into account patient, staff, and system level barriers. We identified champions to lead the change and used quality management tools to address these barriers. We regularly updated staff on changes to the telehealth algorithms.

Our implementation strategy ensured quick adoption of telehealth while maintaining a high VS rate of 93%, with patients receiving telehealth having higher VS rate than those receiving in-person visits. Although these findings are preliminary, they suggest that telehealth is a reliable strategy, which provides continuity of care for PWH while minimizing the risk of exposure to COVID-19 during travel to and at the clinic.

Our findings are in contrast to a recent study from San Francisco, which showed lower VS rates during the pandemic despite higher attendance to telemedicine visits.<sup>8</sup> A survey examining the acceptability of telemedicine in PWH prior to

the COVID-19 pandemic found that 57% of patients chose telemedicine as their preferred modality of HIV care.<sup>9</sup> Reasons cited by participants included ability to fit better with their schedule, decreased travel time and privacy. Telemedicine was the modality of choice for primarily U.S. born, urban, educated men who have sex with men.

One of the challenges in delivering telehealth to PWH is ensuring equitable access to care as not all patients have access to technology. Our larger health system placed an emphasis on synchronous video visits for the telehealth transition. We audited SCC patients' access to technology using a surrogate of enrollment in the EHR patient portal, which was required to support a secure video visit with a clinician. We found that 50% of the SCC patients were not enrolled in the patient portal. For some patients this was due to privacy concerns, but most patients did not have consistent access to a cell phone, internet or data service. Due to the urgency of telehealth implementation and to ensure equitable access to care, we decided to forego video visits and proceeded with telephone visits instead. We educated providers on documentation and billing requirements for this new mode of patient care and found quick uptake by both patients and providers.

Concurrent with the SCC telehealth implementation plan, the U.S. Department of Health and Human Services Guidelines Panel released Interim Guidance for COVID-19 and PWH, which highlighted: 1) the importance of PWH continuing uninterrupted ART during the pandemic, 2) the risk/benefit consideration for patients attending in-person appointments, 3) use of telephone or virtual visits for routine and non-urgent care, and 4) acceptability of postponing routine medical and laboratory visits for PWH with suppressed viral load.<sup>10</sup> Our historically high rate of VS at the SCC further supported the adoption of telehealth to provide ongoing care to PWH.

Interestingly, the increase in GiC and decrease in MVF did not affect our VS rate. These changes in RiC measures could partially be due to the fact that many patients canceled their appointments in March and early April due to concern of contracting COVID-19 in the healthcare setting. In addition, we provided adequate refills to patients beyond the routine 6-month supply that we normally provide, which enabled patients to delay their clinic visits. While MVF and GiC are the measures utilized by HAB to track RiC, they may not be applicable during the pandemic. We utilized other measures of adherence such as refill history to qualify patients for telephone visits.<sup>11</sup>

Our study has several limitations including the fact this project was conducted at a single academic center therefore; the results might not be applicable to other patient populations. While telehealth was associated with higher VS rate than in-person visits, we can not assume a causative relationship as patients who received telehealth were pre-selected based on their prior viral suppression. In addition, due to the retrospective nature of data collection we were unable to capture other variables that might have contributed to the success of

implementation of telehealth in this population such as patient education and employment status. Nonetheless, our findings provide preliminary evidence that telehealth is a feasible alternative to in-person visits for PWH during the COVID-19 pandemic and it has no adverse effects on patient outcomes.

## Conclusion

The COVID-19 pandemic has impacted many aspects of care delivery for PWH. Supported by the Interim Guidance for COVID-19 and PWH, the SCC quickly implemented a telehealth strategy to continue providing care to PWH, specifically those patients with evidence of ART adherence and HIV disease control. Our data suggests that when these qualification measures are enforced, VS can be maintained during a public health emergency.

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## Declaration of Conflicting Interests

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