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CASE REPORT

Description of a Telemedicine Clinic that Materially Advances the Treatment of Human Immunodeficiency Virus-infected Patients

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ABSTRACT

Care of patients infected with the Human Immunodeficiency Virus (HIV) in the United States and Europe is mainly outpatient, where treatment is most efficiently provided using Telemedicine. The goal of treatment is the suppression of viral replication, accomplished by placing patients on anti-retroviral therapy early in the process of disease. Viral suppression is then verified by polymerase chain reaction. Anti-retroviral regimens suppress the virus in >95% of patients who adhere to an appropriate regimen. Consequently, the physician's role in follow up of patients is to encourage adherence to anti-retroviral therapy, a task achievable through Telemedicine clinics. We describe the features of a Telemedicine clinic established in 2006 for residents and incarcerated individuals in the state of Arizona with HIV infection. Important structural and functional elements of the clinic are presented and discussed. Outcomes of the Telemedicine clinic are compared to those achieved in a traditional Brick-and-Mortar clinics. The clinic also provides care for individuals desiring Post-Exposure Prophylaxis, and Pre-Exposure Prophylaxis against HIV. This Telemedicine clinic has successfully served the needs of thousands of HIV-infected residents of the state of Arizona.

Introduction

Before providing Telemedicine clinics for HIV patients the authors practiced in Brick-and-Mortar clinics where a large core of HIV patients regularly returned to clinic as scheduled and adhered to anti-retroviral therapy (ART). However, a growing number of patients missed clinic appointments frequently and interrupted ART. After launching the HIV Telemedicine clinic, we increased our chances of seeing and following these patients, urging them to adhere to ART. Patients were readily willing to meet with us on video on their own terms (i.e., time and place) and we met their requirements in exchange for the opportunity to meet with them face to face on Telemedicine. In addition to the physician, a pharmacist and clinic director were present for all interactions allowing many different aspects of care of the patient to be addressed beyond just talking to the physician.

With the onset of the COVID-19 pandemic in 2020 numerous physicians adopted the technology of Telemedicine to follow sick individuals. For example, Telemedicine was offered to patients with Human Immunodeficiency Virus (HIV)-1 infection throughout the United States (US). However, with time and the waning of COVID-19, many, if not most physicians and hospital systems returned entirely to in-person, or Brick-and-Mortar patient encounters. However, we were convinced of the superiority of Telemedicine for HIV care, and did the opposite, i.e., turned exclusively to Telemedicine to follow HIV patients.[1] Many institutions and individual physicians have ignored the efficiency, and preference of patients for Telemedicine, bowing to financial difficulties centered around empty clinic buildings and the devaluation of Telemedicine encounters compared to in-person visits.[2] Because we have staffed a highly effective HIV Telemedicine clinic since 2006,[3] we thought it important to communicate to others how our clinic is constructed and conducted in order to persuade other HIV caregivers to embrace Telemedicine for their patients.

Description of HIV Telemedicine clinic

The Telemedicine clinic (as we use the term) denotes a video connection between four or more individuals separated geographically. The critical staff of this clinic is composed of a Clinic Coordinator who electronically joins at a minimum, physician, pharmacist, and a patient. Many visits are attended by medical trainees (medical residents, students and nursing students) as well. Only rarely, is the entire visit ever performed by telephone alone.

Setting up the HIV Telemedicine Clinic. Decisions that should be made before beginning the clinic.

1. Pick a day of the week and set aside one-half day for clinic. Clinics for HIV always occur on the same day of the week and at the same time. Patients rapidly become accustomed to the schedule as the care team. This is particularly important for internists and family practice physicians who are caring for patients with other diseases than HIV. However, fixing a clinic day and time for HIV (including such related problems as PEP and PrEP) is very important. The clinic flows most efficiently when the topic is narrowed to one disease. Having only one disease to concern oneself with, helps each clinic team member review data and prepare for seeing the patients.

2. The physician responsible for the clinic selects two individuals to join him/her on the Telemedicine therapeutic team. This is the most important decision that will be made. Ideally, one individual will be a pharmacist or nurse practitioner knowledgeable in the vagaries of HIV infection and in the use of antiretroviral drugs. A clinic coordinator is the third member of the therapeutic team. The clinic coordinator is responsible for scheduling patients and retrieving outstanding data from the laboratory not in the electronic medical record (eMR). The coordinator ensures patients have the necessary hardware and knowledge to link up electronically to the clinic on time. The clinic coordinator must have a working knowledge of the software programs needed to conduct the clinic visit and the ability to reach patients by phone to assist them in entering the video call if necessary.

3. Determine what laboratory specimens can be sent by mail. For example, we often arrange to have oral and rectal cultures/or specimens for the detection of sexually transmitted diseases mailed to the laboratory by the patient from home. Specimen containers along with directions for use

are mailed to the patient beforehand, thus circumventing the need for a clinic or laboratory visit by the patient. Alternatively, services exist to send service personnel to the home of the patient and obtain blood and culture specimens if necessary. It is preferable that such testing be performed ahead of the scheduled clinic visit.

4. Decide which Telemedicine software will be used to conduct the Telemedicine clinic and familiarize the team with the product. We have found HIPAA-compliant Zoom to be adaptable to our needs and those of the patient. It is provided free to our university staff and students. It would be prudent to rehearse the conduct of the clinic with volunteer patients before launching the actual clinic. This will help ensure that each team member stays within their time frame, knows the questions they are to ask and spot potential problems. There are individuals available who can telephonically connect with the patient and assist with video issues they may be having. This is a primary focus of the clinic coordinator.

5. Select an eMR to record the visits. All three members of the clinic team record their findings in the eMR. Since return visits constitute most of encounters, the time on screen will be limited to 20 minutes per patient or less; 20 minutes that is, shared with three team members. Use of pre-populated forms inserted into the eMR save a great deal of time.

6. Each HIV patient is urged to utilize the services of a Primary Care Physician. During the HIV pandemic, we made a conscious decision to limit our medical care to HIV alone. All issues of general health care are performed by Primary Care physicians who receive a copy of our progress notes. We prescribe only HIV-related drugs, no opioids or hormones.

Conduct of the Clinic

1. Prior to starting each clinic, the three clinic team members review records of the last visit by the patient, and any laboratory data or hospital visits that occurred since the last encounter. Most HIV patients are ambulatory and healthy, and little information needs to be reviewed except for selected laboratory values such as viral load results. Even if a viral load has not been obtained within several years, an oral history of the intervening time is usually sufficient to determine whether there may be a potential problem(s).

2. All three team members must be present simultaneously with the patient on the Telemedicine video. The physician reviews the last visit with the patient and determines if there are any current problems. The physician's interview rarely exceeds 10 minutes. The pharmacist/nurse practitioner reviews and updates all medications in the eMR and addresses any vaccine needs within a 10-minute limit. The clinic coordinator ends the interview within 10 minutes asking questions about the patient's home situation, medical insurance and emotional status. Since over 95% of patients are doing well and virally suppressed, each interviewer reinforces the primary message of each visit: i.e., that patients adhere to medication regimens, and follow their primary care provider's age-appropriate health advice and screenings.

Discussion

The effectiveness of our Telemedicine clinic is due to a structure that has evolved over more than 20 years. The components mentioned above, need to be implemented before starting the clinic since any changes confuse patients and affect clinic workflow. With few exceptions, on the day of the Telemedicine clinic, interviewers talk to a patient in the same order: physician, pharmacist followed by the clinic coordinator, and the interviewers generally ask the same questions. We have prioritized treatment (ART) over other aspects of HIV care since it is the crux of the problem. We appreciated years ago that consistent ART administration suppressed viral replication, and prevented downstream deleterious effects, such as frailty.[4-7] The use of Telemedicine allowed us to see patients often and in a timely manner, each visit tailored to the patient's needs. Telehealth technology used in response to a perceived health problem such as an epidemic is remarkably resilient and capable of "on the spot response and assistance."[8] Compared with Brick-and-Mortar clinics, most patients prefer Telemedicine clinics as shown by better clinic show rates.[1] This has been noted in other medical specialties such as gastrointestinal Telemedicine clinics.[9] Other groups have confirmed the efficiency of Telemedicine in treating incarcerated individuals and suppressing

HIV (i.e., <200 copies of HIV-1 RNA).[10] Because the clinic show rate on Telemedicine almost doubled during the COVID pandemic we began to see individuals we had not seen for years in the Brick-and-Mortar clinic. This allowed us to investigate many aspects of HIV not addressed in the past, e.g., the utility of HIV-1 PCR (viral load) in following HIV-infected patients. We found the test was performed too frequently and at great expense, not to mention that each test required patients to visit a laboratory. Current recommendations call for repeating the viral load as often as often every 3-4 months. We have called for changes to be made to these recommendations for viral load testing since once a year or longer is adequate.[11]

Conclusions

The advantages of a Telemedicine clinic. A Telemedicine clinic is preferred over a Brick-and-Mortar by patients for many reasons, including privacy, expediency and efficiency.[1] Other reasons are:

1. Currently all HIV patients should be taking ART. The major challenge for the HIV care team is to encourage and ensure adherence to ART. A Telemedicine clinic is the perfect vehicle to deliver on both goals. With all care team members present on the video at each patient visit there is an opportunity to address all questions of the patient and reinforce adherence to ART.

2. Telemedicine saves money for the patient and treatment team (no transportation costs); since the patient can usually perform Telemedicine at work, work time is not sacrificed either.[1,12,13]

3. Telemedicine is time efficient and flexible. If patients are late or have difficulty connecting, the Clinic coordinator can change the order of appearance and the connection times to accommodate the team (and patient). Compare this with a Brick-and-Mortar clinic where visit times are fixed, and time is often spent waiting for patients who are late or never show.[1,12]

4. Patient problems and/or complaints may arise during the interview by the physician and since all three team members are present the entire time, these issues can be dealt with by the appropriate team member, thus saving time and repetition.

5. Telemedicine was the preferred option for HIV patients to obtain care.[1,13] Consequently, the "show rate" for telemedicine clinics was >90% (often, they were 100%), whereas, for Brick-and-Mortar clinics attendance was 60-70% and occasionally, no patients showed for some clinic dates.

6. The pharmacist is available by video and thus, can answer questions regarding the medications and how to take them (e.g., with or without food).[14] Medication prescriptions are available at pharmacies on the same day and laboratory tests and vaccines can be scheduled by the clinic coordinator as desired by the patients.

7. Since the pharmacist is on all clinic visits appropriate patients can be transitioned to smaller daily pill requirements if necessary as well as to long acting-ART (injectable ART).[15,16]

Disadvantages of Telemedicine

The need for the physician to be present in-person for purposes of seeing, palpating or auscultating rarely occurs. Video cameras are adequate to visualize most skin lesions and patients are capable of characterizing other problems verbally.[1] In addition, we ask patients to see their primary care physician once a year. Nevertheless, the most frequent complaint voiced by physicians who do not do Telemedicine, is a circumstance rarely encountered in practice, meaning that a physician is unable to figure out what to do without being physically present. Telemedicine is a technology that favors the more experienced physicians who are capable of obtaining a relevant and adequate history. History reveals the problem >90% of the time.

Conflict of Interest:

The authors have no conflicts of interest.

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