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Abstract

A Videophone-Delivered Medication Adherence Intervention for Persons Living With HIV: A Case Study of a Rural Participant

Background: Consistent adherence to antiretroviral therapy (ART) is required for the suppression of HIV. However, maintaining adequate adherence is challenging for many persons living with HIV, particularly those living in rural areas. The goal of an ongoing NIMH-funded study is to test the feasibility and efficacy of a medication adherence intervention delivered via videophones to urban and rural persons living with HIV/AIDS. Methods: A case study of "George," a 50-year-old, HIV-positive gay white man living in a rural area is presented in this abstract. Videophone-delivered pill counts conducted before the intervention revealed a baseline adherence rate of 73.5%. A social worker based in New York conducted eight videophone intervention sessions (most 15 minutes in length) with George. The intervention was based upon Nancy Reynolds' "HAART Care" program. Because George frequently forgot to take his pills with him when he left his house each morning, a primary goal involved enabling George to remember to place his pills by his wallet and keys every evening. Results: George's post-intervention adherence rates improved substantially compared to his pre-intervention level: 92.9% at one-week follow-up; 100% at one-month; 98.5% at two-month; and 80.1% at three-month. Conclusion: This case study suggests that videophones offer a feasible, efficacious, and potentially cost-effective means by which to improve and assess ART adherence. Booster sessions are now being used to help maintain initial results of the intervention. Videophone-based interventions might be particularly appropriate for HIV-infected rural persons, because they typically lack easy access to resources that can facilitate their ART adherence efforts.

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A Videophone-Delivered Medication Adherence Intervention for Persons Living With HIV: A Case Study of a Rural Participant

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Background

- Consistent adherence to antiretroviral therapy (ART) is required for the suppression of HIV.
- Although adherence rates of 95% or greater were initially recommended, recent studies suggest that the relationship between HIV medication adherence and viral suppression is more complex than originally presumed.[1-6]
  - For example, a mean adherence rate as low as 54% might still result in HIV viral suppression.[3]
- Still, researchers recommend that practitioners encourage their HIV-infected patients to strive for 100% adherence.[3]
- Recommending dissimilar rates for different regimens might lead to confusion.

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Background

- Maintaining adequate adherence is challenging for many persons living with HIV, particularly those living in rural areas.
- For example, in a study of 329 persons living with HIV disease in rural areas of 12 US states, only 50% of participants self-reported adhering consistently to antiretroviral therapy regimens in the past week.[7]

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Background

- A variety of medication adherence interventions have been tested since the introduction of ART.
- Most of these have been conducted using an "in-person" format, either in clinics (one-on-one or in small groups) or in a person's home.[8-16]
- This approach may not be suitable for persons who cannot or will not readily attend clinics or who live in rural areas.

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Background

- A variety of methods have also been used to *monitor* medication adherence; each method has advantages and disadvantages.
- Table 1 summarizes advantages and disadvantages of five different methods of monitoring adherence.[17-23]

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Table 1: Advantages and Disadvantages of Five Methods of Monitoring Medication Adherence[17-23]

Method	Advantages	Disadvantages
Self-Reported Adherence	Feasible and inexpensive regardless of participant's location.	Subjective; participants often over-estimate adherence.
In-Person Pill Counts	Objective; highly accurate; compatible with use of pill organizers.	Can be expensive and staff-intensive; not feasible in rural areas.
Telephone Pill Counts	Objective; potentially accurate; more feasible/less expensive than in-person pill counts; compatible with use of pill organizers.	Participants may incorrectly count medications; no way to visually verify pill counts.
MEMS Caps	Objective; highly accurate.	Expensive; incompatible with use of pill organizers; assumes that pills are taken each time container is opened.
Pharmacy Refill Data	Objective; inexpensive.	Incompatible with auto-refills; assumes medications are taken.

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Background

- Project ASPIRE, an ongoing NIMH-funded study, has two main goals:
  1. To test the feasibility, acceptability, and efficacy of delivering a medication adherence intervention via videophones to urban and rural persons living with HIV/AIDS.
  2. To test the feasibility, acceptability, and accuracy of videophone-based pill counts as a means of monitoring HIV medication adherence.

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Methods: *Case Study of "George"*

- The case study of "George," a 50-year-old, HIV-positive gay white man living in a rural mid-western town in the United States is discussed in this poster presentation.

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Table 2: Characteristics of George at Baseline

Self-Reported Baseline Adherence Rate	70%
Videophone Pill Count Adherence Rate	74%
T3MS (Raw Score)	99/100 (not impaired)
FAS (SD from Age/Education Norm)	-1.82 (impaired)
Education Level	High School
Current Employment Status/Annual Income	Employed/$24K-$36K
Years Since HIV Diagnosis	28 years
Mode of HIV Transmission	"Sexual Activity"
Past Drug Abuse?	Yes, 2-5 years ago
Past Alcohol Abuse?	Yes, more than 5 years ago
Psychiatric Conditions	Bi-Polar Disorder
Psychiatric Medications	Abilify, Wellbutrin, & Zoloft
Extent of Help with Medications (friends/family)	No Help Provided
External Aid(s) Used to Remember Medications	Pill Organizer (helps "a lot")

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George's ART Regimen

- Kaletra (Protease Inhibitor)
  - 2 pills, twice per day (*b.i.d.*)
  - 7:30AM & 7:30PM
- Epivir (Nucleoside Reverse Transcriptase Inhibitor)
  - 1 pill, twice per day (*b.i.d.*)
  - 7:30AM & 7:30PM
- Viread (Nucleo*tide* Reverse Transcriptase Inhibitor)
  - 1 pill, once per day (*q.d.*)
  - 7:30AM
  - Special instructions: take with a full glass of water

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Methods: *Intervention*

- A social worker based in New York conducted videophone-based intervention sessions with George.
- The intervention is an adapted version of Nancy Reynolds' "HAART Care" (HC) program.
- HC is guided by self-regulation theory.
  - This theory asserts that people attempt to understand their illness (in this case, HIV) by developing a working model or Representation of the disease (in this case, an "HIV Representation") – its causes, effects, duration, and treatment.[28]

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The HAART Care (HC) Intervention

- HC suggests that there are many possible barriers to HIV medication adherence, including the following:
  - Desire to avoid negative side effects
  - Lack of social support
  - Depression/stress
  - Misconceptions of the disease/treatment
  - Stigma
  - Cognitive limitations (such as forgetting to take medications)
- The HC intervention addresses each of these possible barriers and attempts to intervene upon factors that contribute to adherence-incompatible perceptions.

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Modifications Made to the HC Intervention for Project ASPIRE

- In Reynolds' multicenter AIDS Clinical Trial Group (ACTG) 731, the HC intervention was delivered via regular telephone. Intervention sessions occurred once per week for 12 weeks and then once every other week for four weeks (for a total of 14 sessions). The mean length of each session in Reynolds' study was 8 minutes.[29]
- As modified for Project ASPIRE, the HC protocol asked participants to take part in *8* intervention sessions *twice* per week for *four* weeks. Each session was expected to be approximately 30 minutes in duration.
  - These changes enabled us to integrate Spaced Retrieval into the HC protocol, a major focus of the next phase of the project.

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Social Workers' Notes After Intervention Session #1

Had a very good session with "George" this am. FYI. "George" states he has a diagnosis of bipolar disorder and in addition to his HIV meds he takes Abilify, Welbutren, Zoloff and Neutrogen. These are a lot of meds but he feels he has had less depressive episodes since the Abilify-although he is experiencing recent hot flashes and sweats every day . This is frightening and debilitating and he is seeing his Dr in the next few days. He was quite engaged in the session-and comfortable -smoking and drinking coffee during our session and works 9-5 at the local Board of elections and also does some handyman's work. Most days he leaves for breakfast at "Bob Evans" and often has dinner out also-*He has a boyfriend since April*

So his am meds -although many are not a problem it is his 7:00 evening that he often forgets. He keeps all in a pill sorter and transfers his evening pills to a small container to take with him. He often forgets-and even when his alarm on his cell goes off-the pills are not always with him. This is a problem since he is most often out and about at 7:00. I think part is his anxiety/depression in the am and also a lot to do before getting out the door. His wallet and keys are always in the kitchen and he grabs them as he leaves. I offered the suggestion-put the pills in the vial and put them at once near the keys and wallet-instead of in a pocket-or on night table-bathroom. Then those three items are always in the same place to take. He agreed and we will start,,. Good session-nice guy and the vp was so very clear-voice and picture perfect and no backround sounds. !

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Methods: *Intervention*

- Because George frequently forgot to take his pills with him when he left his house each morning, a primary goal involved enabling George to remember to place his pills by his wallet and keys every evening.

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Table 3: Summary of Intervention Sessions

Session #	Days Since Previous Session	Length Of Session	Content of Session
Session #1	n/a	35 min	Determined adherence barriers; developed goal (i.e., put pills by wallet and keys).
Session #2	3 days	15 min	Discussed ways to carry out goal; discussed social support.
Session #3	4 days	15 min	Discussed possible new barriers to adherence; validated use of goal; discussed living situation.
Session #4	3 days	15 min	Discussed possible new barriers to adherence; validated continued use of goal.
Session #5	4 days	15 min	Recapped current goals; discussed whether barriers discussed at Session #1 have changed.
Session #6	3 days	15 min	Validated continued use of goal; discussed depression and its relation to adherence.
Session #7	5 days	15 min	Validated continued use of goal.
Session #8	2 days	15 min	Reviewed goals and accomplishments; discussed next steps.
MEAN	**3.0 days**	**17.5 min**	**n/a**

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Results: *Effectiveness of Videophone-Based Intervention*

- As shown in Table 3, George's adherence rates improved from Pre-Treatment to Post Treatment.
  - This was true for both self-reported (SR) adherence rates AND videophone-based pill count (VBPC) adherence rates.
  - At the 3-month follow up interview, George's VBPC adherence rate dropped considerably, but was still above his pre-treatment VBPC adherence rate.
- It should be noted that, during Pill Count #1, it was discovered that George had accumulated *over 1,000 Kaletra pills.*
  - This was most likely due to many years of poor adherence.

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Table 3: George's Medication Adherence Rates Throughout the Course of the Study

	Point of Contact	Self-Reported Adherence Rate (over past 4 days)	VP-Based Pill Count Adherence Rate (since last pill count)
Pre-Treatment	Screening/Baseline #1	70%	n/a
	Baseline #2 (10 days later)	80%	n/a
	Pill Count #1 (11 days later)	100%	n/a
	Pill Count #2 (33 days later)	50%	74%
	Pill Count #3 (mid-treatment)	100%	90%
Post-Treatment	1 Week Post Treatment	100%	93%
	1-Month Post-Treatment	100%	100%
	2-Month Post-Treatment	100%	99%
	3-Month Post-Treatment	100%	81%

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Results:
Reasons for Missing Medications

- As shown in Table 4, George identified fewer reasons for missing medications at the 3-month follow up interview, as compared to the screening interview
  - In particular, George's goal of placing his pills near his wallet and keys every evening seemed to reduce the frequency with which he missed due to having a change in daily routine, falling asleep/sleeping through a dose, and simply forgetting.

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Table 4: George's Reasons for Missing Medications at the Screening Interview and at the 3 Month Follow Up Interview

Reasons for Missing Medications	Frequency at Screen	Frequency at 3-mo FUP
Felt Depressed/Overwhelmed	Sometimes	*Never*
Away from Home	Rarely	Often
Had a Change In Daily Routine	Rarely	*Never*
Fell Asleep/Slept Through Dose Time	Rarely	*Never*
Simply Forgot	Sometimes	*Never*
Busy With Other Things	Never	Rarely

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Results:
The Acceptability of Videophones

- Regarding the acceptability of videophones, George reported that…
  - It was somewhat easy to use the videophone.
  - He liked using the videophone a lot; however, the video reception and audio quality were poor at times.
  - He definitely would be willing to use a videophone again in the future.

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Results:
The Feasibility of Videophones

- A videophone was sent to George via Fed Ex and was set up in less than 30 minutes. Picture-based instructions made this process very easy for George.
- Though George lived hundreds of miles away from the social worker, videophones enabled him to take part in private, "face-to-face" adherence counseling sessions.
- Seven of the 8 intervention sessions took place via videophone (one session had to be conducted via telephone, due to a telephone line being down).
- The relatively poor video and audio quality signals did have a negative impact on George's feeling about using the videophone.
- Retrieving the videophone from George *in particular* was not difficult (FedEx picked up the videophone from his house).
  - However, the retrieval of videophones has been challenging for *other participants*. In the future, we may work with participants who already have access to web-based conference services, such as Skype, to avoid the need to retrieve videophones.

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Results:
Accuracy of Videophone-Based Pill Counts

- Each pill count was assigned a value of 1, 2, or 3:
  - 1=no specific reason to doubt accuracy of pill count
  - 2=specific reason to doubt the accuracy of pill count
  - 3=pill count DEFINITELY inaccurate (invalid adherence rate results)
- None of George's pill counts were assigned a value of "3"; that is, none of his pill counts were definitely inaccurate
  - Only 4.6% of pill counts conducted with other participants resulted in invalid adherence rates.
  - The most likely explanation for invalid pill counts is that participants were incorrect in reporting that they did not receive a refill since the last pill count.
  - In the future, we will be collecting refill data from pharmacies.

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Results:
Accuracy of Videophone-Based Pill Counts

- None of George's pill counts were assigned a value of "2"; that is, there were no specific reasons to doubt the accuracy of any of George's pill counts.
  - 16.3% of pill counts conducted with other participants were assigned a value of "2"
  - The most common reasons for doubting the accuracy of a pill count include:
    - The participant was unsure of refill date/quantity;
    - The participant had pills in a location other than home;
    - The participant admitted to hiding pill bottles.
- More specific information about the pill count protocol and results of pill counts with other participants are available upon request.

Conclusion

- This case study suggests that videophones may offer a feasible, efficacious, and potentially cost-effective means by which to improve and assess ART adherence.
- Booster sessions are now being used to help maintain initial results of the intervention.
- Videophone-based interventions might be particularly appropriate for HIV-infected rural persons, because they typically lack easy access to resources that can facilitate their ART adherence efforts.

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