The LifeWindows Project: Computer-Delivered Intervention Improves Antiretroviral Adherence among People with HIV in Clinical Care

Deborah H. Cornman, Ph.D.
Center for Health, Intervention, and Prevention
University of Connecticut

Center for Interdisciplinary Research on AIDS
eHealth and Behavioral Economics for HIV Prevention and Treatment
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Need for Multifactor Interventions

- ART adherence is a complex, dynamic behavior with multiple determinants that change over time.
- Adherence interventions must be comprehensive and address a variety of adherence issues.
Information-Motivation-Behavioral Skills (IMB) Model of ARV Adherence addresses these issues
ADHERENCE MOTIVATION
Personal Motivation: Attitudes and beliefs about adherence.
Social Motivation: Perceptions of significant others’ support for adherence.

ADHERENCE INFORMATION
About: one’s regimen, correct ARV utilization, adequate adherence, side effects, drug interactions, heuristics and implicit theories concerning adherence.

ADHERENCE BEHAVIORAL SKILLS
Objective and perceived skills for: acquiring, cueing, and administering ARVs; incorporating ARVs into daily life; minimizing side effects; updating adherence-related facts as necessary; acquiring support for adherence; self-reinforcing adherence over time.

ADHERENCE BEHAVIOR
Proper dosing, optimal adherence, adherence over time.

MODERATING FACTORS AFFECTING ADHERENCE
Psychological health (e.g., depression); substance use/addiction; unstable living situation; poor access to medical care and services.

HEALTH OUTCOMES
Viral load, drug resistance, CD-4 count, objective and subjective health.

Goal of Project

- In collaboration with PLHIV and HIV care providers:
  - Develop a computer-based software program that...
    - Assesses individuals’ specific barriers to ART adherence.
    - Provides individuals with highly interactive and engaging activities that can help them overcome their specific barriers.
Formative Research

- Identified information, motivation, and behavioral skills (IMB) factors associated with ART non-adherence among PLHIV in Connecticut, U.S.

  - Paper-and-pencil measures completed by PLHIV \( (n=101) \).
  - Focus group discussions with PLHIV \( (n=46) \).
  - Focus group discussions with HIV healthcare providers \( (n=15) \).
Intervention Design

- Motivational Interviewing (MI) is used as vehicle to deliver intervention.
  - Patient-centered approach to enhancing individuals’ motivation to change.

- Intervention is designed to be continuous and ongoing.
  - Patient interacts with intervention every time s/he comes to the clinic for a medical visit.
  - Intervention session occurs prior to visit with medical provider.
LifeWindows

- **Personalized and interactive computer program.**

- Assesses each participant’s specific barriers to adherence and provides him/her with a **tailored** list of activities to work on.

- Takes approximately 30 minutes to complete.
LifeWindows: Program Flow

- Tutorial
- Assessment
- Goal Evaluation*
- Strategy Selection*
- Activity Selection*
- Activity*
- Goal Setting*

* Intervention condition only

- A brief tutorial instructs participants on how to navigate within LifeWindows.
LifeWindows: Program Flow

1. Tutorial
2. Assessment
   - Goal Evaluation*
   - Strategy Selection*
   - Activity Selection*
   - Activity*
   - Goal Setting*

* Intervention condition only

- Demographics
- Physical and mental health (SF-8)
- IMB deficits associated with non-adherence
- Self-reported ART regimen
- Self-reported ART adherence
Barriers to Adherence Assessment

- **LW-IMB-AAQ**: Developed to identify adherence-related IMB barriers
  - Information - 9 items
  - Motivation - 10 items
  - Behavioral Skills - 14 items
## My HIV Medication Regimen

Click on the number of pills you took only in the time slots when you actually took them.

### YESTERDAY (TUESDAY)

<table>
<thead>
<tr>
<th>TIME SLOT</th>
<th>MEDICATION</th>
<th>WHAT HAPPENED YESTERDAY (TUESDAY)?</th>
</tr>
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<tbody>
<tr>
<td>12:00 AM - 4:00 AM</td>
<td>125</td>
<td></td>
</tr>
<tr>
<td>4:00 AM - 8:00 AM</td>
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<td></td>
</tr>
<tr>
<td>8:00 AM - 12:00 PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00 PM - 4:00 PM</td>
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<td>4:00 PM - 8:00 PM</td>
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</tr>
<tr>
<td>8:00 PM - 12:00 AM</td>
<td></td>
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</tr>
</tbody>
</table>

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**How much of this medication have you taken in the last three to four weeks?**

- 0% means you have taken none of this medication
- 50% means you have taken half of this medication
- 100% means you have taken every single dose of this medication

If you have been prescribed this medication for less than 3 to 4 weeks, please indicate how much of this medication you have taken since it was prescribed.
LifeWindows: Program Flow

- Tutorial
- Assessment
- Goal Evaluation*
- Strategy Selection*
- Activity Selection*
- Activity*
- Goal Setting*

* Intervention condition only

- Based on their IMB and other deficits, participants are provided with a tailored list of adherence-promoting strategies.
LifeWindows: Program Flow

Tutorial
Assessment
Goal Evaluation*
Strategy Selection*
Activity Selection*
Activity*
Goal Setting*

* Intervention condition only

After selecting a strategy, participants are given a list of strategy-specific activities and are asked to choose one.
LifeWindows: Program Flow

Tutorial

Assessment

Goal Evaluation*

Strategy Selection*

Activity Selection*

Activity*

Goal Setting*

- A total of 20 different activities address adherence-related IMB and other deficits.
- Participants can explore interventions at their own pace.

* Intervention condition only
LifeWindows: Program Flow

- Tutorial
- Assessment
- Goal Evaluation*
- Strategy Selection*
- Intervention Selection*
- Intervention*
- Goal Setting*

* Intervention condition only

- Participants select an adherence-related goal that they will accomplish before their next LifeWindows session.
LifeWindows: Program Flow

- Tutorial
- Assessment
- Goal Evaluation*
- Strategy Selection*
- Intervention Selection*
- Intervention*
- Goal Setting*

* Intervention condition only

- Participants are asked about the progress they made toward the goal that they set during their previous LifeWindows session.
Adherence Support Activities

- 20 activities designed to address specific deficits associated with non-adherence.
  - Variable in length but average about 10 to 15 minutes.
  - Highly engaging and interactive.
  - Includes activities that deal with maintenance and relapse prevention.
Examples of Activities
Addressing Information
Barriers
Uses animation to inform patients about how HIV medications fight HIV, suboptimal adherence, and medication resistance.
Journey through the Bloodstream

Chapter 1: The Bloodstream
Learn about the human bloodstream, the types of cells that make up your blood, and what these cells do.

Chapter 2: HIV Attacks
Learn what happens when HIV enters your body and how HIV affects your T-Cells.

Chapter 3: Fusion Inhibitors
Learn how fusion inhibitors (entry inhibitors) can help fight HIV.

Chapter 4: NRTIs (Nukes) and NNRTIs (Non-Nukes)
Learn how NRTIs (Nukes) and NNRTIs (Non-Nukes) can help fight HIV.

Chapter 5: Protease Inhibitors
Learn how protease inhibitors (PIs) can help fight HIV.

Chapter 6: Viral Load and T-Cell Count
Learn about the importance of taking your HIV medication every day at the right time.

Chapter 7: Optimal Adherence
What is it and why is it important? Learn about drug resistant strains and the benefit of maintaining a low viral load and a high T-Cell count.

Entry Inhibitors
Learn about Selzentry (Maraviroc), a CCR5 Entry Inhibitor

Integrase Inhibitors
Learn about Isentress (Rilpivirine), an Integrase Inhibitor
Side Effect Solutions

- Provides information about the side effects caused by ARVs and tips for managing them.
Information Station

- Provides information about support services and resources in different areas of Connecticut.

This and additional information can also be found by calling 211 or by going to www.infoine.org.
Examples of Activities Addressing Motivation Barriers
Lipodystrophy

- Video accounts of PLHIV who have experienced lipodystrophy.
  - Designed to help people deal with their fear that ARVs will negatively affect their physical appearance.
Focus on the Fight

- Uses guided imagery to help patients visualize the therapeutic effects of HIV medications on their body. Helps promote positive attitudes towards one’s medications.
Examples of Activities Addressing Behavioral Skills Barriers
Skip Sisdose

- Uses humorous animation to provide skills training in how to fit ARVs into one’s life, take ARVs when one’s routine changes, and take ARVs when others are around.
Bill the Pill

- Animated character provides behavioral skills training for those having trouble swallowing pills or keeping medications down.
  - Discusses pill cutters and crushers, mixing pills with food, and managing nausea.
Bill the Pill
MedMinders

- Discusses tools that PLHIV can use to help them address concerns over privacy, difficulty remembering to take their ARVs, and fitting medications into their daily lives.
Battle for Health

- Video game in which patients fight off infections, take HIV medications at specific times to fight HIV, and use tools such as pillboxes and alarms to ensure that medications are taken as prescribed, even in challenging situations.
Most Frequently Visited Activities

- Journey through the Bloodstream
- Doc Talk
- Positive Voices
A large-scale randomized clinical trial of LifeWindows was conducted from March 2006 to March 2008.
594 patients receiving care at 5 HIV care clinics in Connecticut participated in the study.

They were randomly assigned to condition.

- 304 to control condition.
- 290 to intervention condition.
LifeWindows Sample

- Mean Age: 47 years
- Living with HIV for 13 years
- 61% were men, 39% were female
- 74% reported a heterosexual orientation
- 6% reported injecting drugs in the past month
Participants completed from 1 to 18 LifeWindows sessions (mode = 6 sessions) over a period of 18 months.

Participants took part in 4155 sessions, of which 3924 included ART adherence assessments.

Adherence assessments were not conducted at visits where patients’ medical records indicated complete discontinuation of all ARVs.
Adherence

- **ACTG Adherence:** Total # of pills taken over 3 days divided by total # of pills prescribed for all ARV medications.

- **VAS Adherence:** Average % adherence over 3-4 weeks for all ARV medications.

- Outcomes were evaluated with growth modeling via Hierarchical Linear Modeling (HLM).
Intent-to-Treat vs. On Protocol

- **Intent-to-Treat (ITT) Sample** – All participants with 2 or more LifeWindows sessions in which adherence data were collected, regardless of whether participants continued to be prescribed ARVs throughout the study, attended the clinic with any regularity, or used LifeWindows regularly.

- **On Protocol (OP) Sample** – Participants who were relatively regular users of clinical care and thus users of LifeWindows (6 or more LifeWindows visits during the study) and who remained on ARV treatment throughout the study (had no permanent or intermittent discontinuation of ARVs).
Perfect (100%) Adherence (ACTG) over Time (ITT) ns

Proportion with 100% adherence

LifeWindows Visit Number

n=594

ITT: Includes participants who did not attend clinical care or use LifeWindows regularly, or who were discontinued from all ARVs during the study.
Perfect (100%) Adherence (ACTG) over Time (OP) **

** p < .02

Proportion with 100% adherence over time for the intervention and control arms. The intervention arm shows a higher proportion of participants with 100% adherence compared to the control arm.

OP: Includes participants who completed 6 or more LifeWindows sessions and were not interrupted or removed from ARVs during participation.

n=328 (55%)

t(326) = 2.37, p = .018

(90% p = .04, 80% p = .03, 70% p = .02)
Over a three-month period, the odds of being perfectly adherent were 12% higher for those in the treatment than in the control arm.*

* For “typical users” who are in relatively consistent contact with clinical care and remain on ARVs.
LifeWindows Team

- Altice, Frederick (Co-I, Yale New Haven Medical School)
- Amico, K. Rivet (Co-PI, CHIP/UCONN)
- Barta, William (CHIP/UCONN)
- Danvers, Karina - Intervention developer
- Dieckhaus, Kevin (Co-I, UCHC)
- Ferrer, Becky (Graduate Student, CHIP/UCONN)
- **Fisher, Jeffrey (PI, CHIP/UCONN)**
- Fisher, William (Co-PI, CHIP/UWO)
- Friedland, Gerald (Co-I, Yale New Haven Medical School)
- Garcia, Randi (Graduate Student, UCONN)
- LeMieux, Anthony (CHIP/UCONN)
- Norton, Wynne (Graduate Student, CHIP/UCONN)
- Portnoy, David (Graduate Student, CHIP/UCONN)
- Redding, Caroline (Project Manager, CHIP/UCONN)
- Ross, Jack (Co-I, Hartford Hospital)
- Shuper, Paul (CHIP/UCONN)
- Smith, Laramie (Graduate Student, CHIP/UCONN)
- Strickler, Zoe (CHIP/UCONN)
- Trayling, Cynthia (Project Manager, CHIP/UCONN)
- Villanueva, Merceditas (Co-I, Waterbury Hospital)
- Wagner, Krystn (Co-I, Yale New Haven Medical School)
- Weissman, Sharon (Co-I, St. Raphael’s Hospital)

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For more information...

Debbie Cornman:
E-mail: deborah.cornman@uconn.edu
Phone: 860-208-3035

CHIP Website:
http://www.chip.uconn.edu/