The IMB Model, HIV Prevention for Positives, and Adherence

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www.chip.uconn.edu
Adults and Children Estimated to be Living with HIV, 2007

Total: 33 (30 – 36) million

Source: UNAIDS/Global Report 2008
Estimated Adult and Child Deaths from AIDS, 2007

Total: 2.0 (1.8 – 2.3) million

Source: UNAIDS/Global Report 2008
Adults and Children Estimated to be Living with HIV in the U.S., 2007

Total: 1,200,000 (690,000 – 1,900,000)

Source: UNAIDS/Global Report 2008
Weaknesses in Many Existing HIV Prevention Programs

• Many HIV prevention interventions are intuitive and atheoretical, and are *not* informed by state-of-the-art behavioral science theory.

• Many HIV prevention interventions are not evidence-based.

• Many interventions are not “tailored,” based on elicitation research, to the target population.
(Continued)

- Too many interventions focus only on providing HIV prevention information. (Information is necessary, but not sufficient, for behavior change).
- Too many interventions fail to motivate individuals to practice safer behavior, and fail to teach them the necessary behavioral skills.
- Too few HIV prevention interventions are rigorously evaluated.
- Very few prevention interventions that are found to be effective are disseminated widely.

The Information-Motivation-Behavioral Skills Model of HIV Risk and Prevention
The Information - Motivation - Behavioral Skills Model of HIV Risk and Prevention

(J. Fisher & Fisher, 1992; Psychological Bulletin)
Tests of the IMB Model
Model Test for Gay Men

HIV Prevention Information

HIV Prevention Motivation

HIV Prevention Behavioral Skills

HIV-Preventive Behavior

.01

.25*

.36*

.29**

.42*

-.03

Model Test for Urban High School Students

HIV Prevention Information

HIV Prevention Motivation

HIV Prevention Behavioral Skills

HIV Preventive Behavior

Tests of the Information--Motivation--Behavioral Skills Model with respect to Sexual Risk behavior:
(Summary of Reported Associations Among IMB Components; J. Fisher et al., 2009).

<table>
<thead>
<tr>
<th>Source</th>
<th>Location</th>
<th>Sample</th>
<th>Information-motivation</th>
<th>Information-behavioral skills</th>
<th>Motivation-behavioral skills</th>
<th>Behavioral skills-behavior</th>
<th>Information-behavior</th>
<th>Motivation-behavior</th>
<th>Percent variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anderson et al. (2006)</td>
<td>Urban housing developments in NY, OH, VA, WA, and WI</td>
<td>N=557 low income women (76% African American)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50%</td>
</tr>
<tr>
<td>Bryan et al. (2000)</td>
<td>Methadone maintenance program in Hartford, CT</td>
<td>N=156 heroin-addicted adults receiving methadone treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35%</td>
</tr>
<tr>
<td>Bryan et al. (2001)</td>
<td>Chennai, India</td>
<td>N=300 male truck drivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40-51%(^{1})</td>
</tr>
<tr>
<td>Fisher et al. (1994)</td>
<td>University in Storrs, CT</td>
<td>N=259 university students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10%</td>
</tr>
<tr>
<td>Fisher et al. (1994)</td>
<td>Hartford and New Haven, CT</td>
<td>N= 126 gay men</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35%</td>
</tr>
<tr>
<td>Fisher et al. (1999)</td>
<td>Miami, FL</td>
<td>N= 87 male high school students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>75%</td>
</tr>
<tr>
<td>Fisher et al. (1999)</td>
<td>Miami, FL</td>
<td>N=61 Female high school students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>45%</td>
</tr>
<tr>
<td>Kalichman, Malow, et al. (2005)</td>
<td>Inner-city areas of Miami-Dade County, FL</td>
<td>N=320 substance abusing, severely mentally ill adults</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>not stated</td>
</tr>
<tr>
<td>Kalichman et al. (2006)</td>
<td>STI clinic in Cape Town, South Africa</td>
<td>N=191 STI clinic patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>not stated</td>
</tr>
<tr>
<td>Robertson et al. (2006)</td>
<td>Juvenile detention center in a southern U.S. city</td>
<td>N=195 female incarcerated juvenile offenders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>not stated</td>
</tr>
<tr>
<td>Robertson et al. (2006)</td>
<td>Juvenile detention center in a southern U.S. city</td>
<td>N=328 male incarcerated juvenile offenders</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td>not stated</td>
</tr>
</tbody>
</table>

\(^{1}\) Findings from Bryan et al. (2001) represent tests of relationships of information, motivation, behavioral skills with behavior, and percent of variance accounted for in condom use with wives and with commercial sex workers.
Phase I: Elicitation Research

Phase II: Individually Tailored IMB Intervention

Phase III: Evaluation/Outcome Research

(J. Fisher & Fisher, 1992 *Psychological Bulletin*)
HIV Prevention Interventions Using the IMB Model
<table>
<thead>
<tr>
<th>Source</th>
<th>Location</th>
<th>Sample</th>
<th>IMB model-based Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anderson et al. (2006)</td>
<td>Urban housing developments in NY, OH, VA, WA, and WI</td>
<td>N=557 low income women (76% African American)</td>
<td>Five 90-minute group workshops emphasizing HIV-related information, positive attitudes, and condom use and negotiation skills. The intervention also included community-based activities and the formation of a community-based Women’s Health Council.</td>
</tr>
<tr>
<td>Belcher et al. (1998)</td>
<td>Low-income, inner city community in Atlanta, GA</td>
<td>N=74 women (95% African American)</td>
<td>Single-session HIV prevention intervention focusing on HIV-related education, problem solving, communication skills, self-efficacy, assertiveness training, and development of action plans.</td>
</tr>
<tr>
<td>Boyer et al. (2001)</td>
<td>US Marines in the Western Pacific</td>
<td>N=619 male US Marines</td>
<td>Four 2-hour interactive group sessions focusing on STI/HIV risk-related knowledge, alcohol use, and skills training.</td>
</tr>
<tr>
<td>Carey et al. (1997)</td>
<td>Syracuse, NY</td>
<td>N=102 women (76% African American)</td>
<td>Four 90-minute group sessions involving motivational interviewing techniques, HIV-related knowledge enhancement, and interpersonal skills building.</td>
</tr>
<tr>
<td>Carey et al. (2000)</td>
<td>CBO in Syracuse, NY</td>
<td>N=102 women (88% African American)</td>
<td>Four 90-minute group sessions involving motivational interviewing techniques, HIV-related knowledge enhancement, and interpersonal skills building.</td>
</tr>
<tr>
<td>Cornman et al. (2008)</td>
<td>Urban HIV-care clinic in KwaZulu-Natal, South Africa</td>
<td>N=152 HIV+ patients on ARVs receiving clinical care</td>
<td>Multiple 15-minute intervention sessions delivered by counselors during routine care aimed at increasing HIV-related knowledge, changing negative attitudes, building skills, and setting goals.</td>
</tr>
<tr>
<td>Cornman et al. (2007)</td>
<td>Chennai, India</td>
<td>N=250 male truck drivers</td>
<td>Single-session group interactive workshop that focused on addressing information deficits, decreasing negative condom attitudes, and rehearsing condom use skills.</td>
</tr>
</tbody>
</table>
Table 2. (continued)

Effective Sexual Risk-Reduction Interventions Using the Information-Motivation-Behavioral Skills (IMB) Model.

<table>
<thead>
<tr>
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<th>Location</th>
<th>Sample</th>
<th>IMB model-based Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fisher et al. (1996)</td>
<td>University in Storrs, CT</td>
<td>N=744 undergraduate dormitory residents</td>
<td>Three 2-hour sessions involving a slide show to present HIV-related information; group discussions to enhance attitudes; and video-based and in-vivo skills training.</td>
</tr>
<tr>
<td>Fisher et al. (2002)</td>
<td>4 inner-city high schools in CT</td>
<td>N=1577 High school students</td>
<td>Five-session classroom-based intervention providing HIV-related information, attitudinal change videos, and video-based and hands on skills training.</td>
</tr>
<tr>
<td>Fisher et al. (2006)</td>
<td>2 of the largest HIV clinics in CT</td>
<td>N=497 HIV+ patients receiving clinical care</td>
<td>Multiple 5-10 minute intervention sessions delivered by clinicians during routine care addressing IMB barriers, ambivalence to behavior change, and risk-reduction goals.</td>
</tr>
<tr>
<td>Jaworski et al. (2001)</td>
<td>University in Syracuse, NY</td>
<td>N=78 female university students</td>
<td>Single-session intervention emphasizing STI information, advantages of risk-reduction, and skills training.</td>
</tr>
<tr>
<td>Kalichman et al. (2005)</td>
<td>STI Clinic in Milwaukee, WI</td>
<td>N=612 STI Clinic patients</td>
<td>Single 90-minute counseling session emphasizing HIV-related information and personal responsibility and providing personalized feedback and skill training.</td>
</tr>
<tr>
<td>Kalichman &amp; Cherry (1999)</td>
<td>STI Clinic in Atlanta, GA</td>
<td>N=106 male STI Clinic patients (100% African American)</td>
<td>Single 3-hour group-based session providing HIV-related information along with motivational and skills training (for either latex or polyurethane condoms).</td>
</tr>
<tr>
<td>Kalichman et al. (1999)</td>
<td>STI Clinic in Atlanta, GA</td>
<td>N=117 male STI Clinic patients (100% African American)</td>
<td>Two 3-hour video-based intervention sessions involving HIV-related information, motivational training, and skills acquisition and practice.</td>
</tr>
<tr>
<td>Kalichman et al. (1999)</td>
<td>STI Clinic in Atlanta, GA</td>
<td>N=81 female STI Clinic patients (100% African American)</td>
<td>Single 2.5 hour workshop emphasizing HIV-related information, female condom use and skills, and communication skills.</td>
</tr>
<tr>
<td>Kiene &amp; Barta (2006)</td>
<td>University in Storrs, CT</td>
<td>N=157 university students</td>
<td>Two-session computer-based intervention emphasizing HIV-related information, advantages of using condoms, normative support, behavioral skills, and goal setting.</td>
</tr>
<tr>
<td>Source</td>
<td>Location</td>
<td>Sample</td>
<td>IMB model-based Intervention</td>
</tr>
<tr>
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</tr>
<tr>
<td>Metzler et al. (2000)</td>
<td>Public Health STI Clinics in Oregon</td>
<td>N=339 adolescents</td>
<td>Five 60-90 minute individual counselor-participant sessions emphasizing goal setting, assertiveness training, social skills training, and behavioral self-management.</td>
</tr>
<tr>
<td>Otto-Salaj et al. (2001)</td>
<td>Community mental health clinics in Milwaukee, WI</td>
<td>N=189 men and women from outpatient programs</td>
<td>Seven-session small group intervention (+2 booster sessions) emphasizing HIV/AIDS risk, self-efficacy, condom use skills, and safer-sex role-plays.</td>
</tr>
<tr>
<td>Peeler (2000)</td>
<td>University in Pullman, WA</td>
<td>N=386 university students</td>
<td>15-session interventions (self-management and peer norm) emphasizing HIV-related information, condom use skills, role-playing, self-management skills training, and enhancement of positive peer norms.</td>
</tr>
<tr>
<td>Rosengard (1992)</td>
<td>University in Storrs, CT</td>
<td>N=701 university students</td>
<td>Three-session intervention emphasizing AIDS information, attitudes, social norms, and skills training.</td>
</tr>
<tr>
<td>Rotheram-Borus et al. (1998)</td>
<td>Social service agency in New York, NY</td>
<td>N=151 adolescents</td>
<td>Seven 1.5 hour intervention sessions emphasizing HIV knowledge, perceived risk, self-efficacy, negotiation and condom use skills, and goal setting.</td>
</tr>
<tr>
<td>St. Lawrence et al. (1995)</td>
<td>Southern US City</td>
<td>N=246 Adolescents (100% African American)</td>
<td>Eight 1.5-2 hour weekly group sessions emphasizing HIV-related information, values, empowerment, perceived vulnerability, and communication and condom use skills.</td>
</tr>
<tr>
<td>St. Lawrence et al. (2002)</td>
<td>Residential drug treatment programs in MS</td>
<td>N=161 substance-dependent adolescents</td>
<td>Twelve 90-minute group sessions emphasizing HIV risk-related knowledge, personal responsibility, condom and negotiation skills, and personal vulnerability.</td>
</tr>
<tr>
<td>Simbayi et al. (2004)</td>
<td>STI Clinic in Cape Town, South Africa</td>
<td>N=228 STI clinic patients</td>
<td>Single 60-minute counseling session emphasizing HIV-related knowledge, motivation and commitment to change, and behavioral self-management and communication skills.</td>
</tr>
<tr>
<td>Walter &amp; Vaughn (1993)</td>
<td>High schools in New York, NY</td>
<td>N=1201 9th and 11th grade students.</td>
<td>Six in-class sessions emphasizing AIDS transmission and prevention information, appraisal of perceived risk, personal values, condom skills, and negotiation skills.</td>
</tr>
<tr>
<td>Weinhardt et al. (1998)</td>
<td>Public psychiatric hospital in upstate NY</td>
<td>N=22 female outpatients living with mental illness</td>
<td>Ten daily 75-minute treatment sessions focusing on HIV-related information, vulnerability, negotiation skills, and sexual assertiveness training.</td>
</tr>
</tbody>
</table>
Prescribing Prevention: A Clinician-Delivered Intervention for Promotion of Safer Sex and Safer Needle Use Among HIV+ Individuals in Clinical Care

A Global Prevention “Cocktail”

- For an effective global HIV prevention portfolio, we need to consider the design of “prevention cocktails” that involve potent HIV prevention interventions for *seronegatives*, and potent HIV prevention interventions for *seropositives*.

- To date, worldwide, the vast majority of HIV prevention interventions have focused on *seronegatives*. 
Why Prevention with Positives?

- All new HIV infections must involve an HIV seropositive individual.

- Given limited funds, it may be cost-effective to encourage HIV testing and to intervene with individuals who are HIV positive, as well as those who are HIV negative.

- While most HIV positive individuals who know their serostatus reduce their risk levels, some do not.

- In the ART era, prevalence rates for HIV infection will continue to climb. Prevention for positives would seem to make sense.
Estimated HIV Infection Incidence and Prevalence, by Year, 1977-2003, United States

Physician-Based Intervention for Seropositives
The Problem:

HIV+ patients in clinical care may engage in risky behaviors that can adversely affect their own and others’ health.
Risky Behavior from Options Project Data on U.S. Patients in Clinical Care
Past and Present Injection Drug Use

• About 60% of participants who were questioned reported ever having used injection drugs, while 32% reported injection drug use in the past month.

• Of those who used injection drugs in the past month, 38% borrowed or lent uncleaned works or needles during this interval.

• On the other hand, 64% of those who had ever used injection drugs had been in recovery for a year or more.
Sexual Events in the Preceding Three Months (N=490 participants)

• 49% (240) of the entire, HIV+ sample reported engaging in a vaginal and/or anal sexual event in the preceding three months.

• 40% (95) of these individuals reported some degree of risk (*events with no condom use*) during one or more of these events.
In the preceding three months, 240 participants engaged in 5204 Vaginal and/or Anal Sex events:

- 34% (1785 sex events) were unprotected
- 67% (3419 sex events) were protected
Of the 1785 unprotected sex events reported by the 95 participants reporting risky sexual behaviors:

- 60% (1073 events) involved HIV Negative and/or Unknown Partners
- 39% (712 events) involved HIV Positive Partners
Clearly, there is substantial risk behavior in our clinical care sample.
Given mounting evidence of the transmission of resistant strains of HIV, this is even more problematic than in the past.
Health care providers have an excellent opportunity to address risk behaviors and to reinforce safer behaviors in their HIV+ patients

• Many have a trusting relationship with their patients.

• Many have repeated contacts with their patients over long periods of time.
But health care providers’ interactions with patients about patients’ risky and safer behaviors are often ad hoc, and are relatively infrequent across patients’ visits.
• Literature reviews find relatively few rigorously evaluated, effective interventions involving *health care providers* attempting to assist HIV+ patients with safer sex behavior.
The Options Project:

A collaboration between health care providers, HIV+ patients, and researchers to assist HIV+ patients in addressing their risky behaviors.
Conceptual Basis of the Options Project
The Information-Motivation-Behavioral Skills Model of HIV Prevention

In the Options Project, *Motivational Interviewing* is used as a vehicle to deliver an Information-Motivation-Behavioral Skills HIV prevention intervention.
Motivational Interviewing

“The strategies of Motivational Interviewing are more persuasive than coercive, more supportive than argumentative. The clinician seeks to create a positive atmosphere that is conducive to change. The overall goal is to increase the patient’s intrinsic motivation, so that change arises from within rather than being imposed from without. When this approach is done properly, it is the patient who presents the arguments for change, rather than the clinician.”

Miller and Rollnick (1991, p. 52)
Options Project Protocol for Provider Interactions with Patients about Safer Sex
Options Protocol for Each Patient Visit

• Set the agenda to discuss safer sex.

• Assess risk behavior.

• Determine how to proceed by first having patients rate the “importance” of changing their risk behavior, and their “confidence” that they could change it.

• Further explore either Importance or Confidence.

• Elicit a menu of specific strategies from the patient for raising his or her score.

• Negotiate a goal or action plan with the patient.

• Give a “behavioral prescription” to the patient.
Prevention Prescription

Date:________________

Name:_______________________________________

Plan:________________________________________

____________________________________________

____________________________________________

____________________________________________

____________________________________________

____________________________________________

____________________________________________

____________________________________________

____________________________________________

____________________________________________

Signature
Options Project
Intervention Outcomes at Eighteen Months
• Intervention efficacy for changing sexual risk behavior was assessed by modeling risk behavior as a function of intervention condition, time, and the interaction between condition and time.

• Generalized Estimating Equations (GEE) within a general linear model framework was used for the data analyses, because of both the correlated nature of the longitudinal data and its Poisson distribution (count data).
• No covariates were identified in our assessments for pre-test non-equivalence, nor did we find significant differential attrition by condition.

• Our primary outcome assessment evaluated intervention impact on unprotected vaginal, anal, and insertive oral sex events over a maximum of 4 waves of data collection.
GEE Results

• For the mean of unprotected vaginal, anal, and insertive oral sex events, THE TIME X CONDITION INTERACTION WAS SIGNIFICANT (b = -.51, se = .15, p < .001).

• Risk behavior was significantly reduced in the intervention group (b = -.51, se = .23, p < .05) but significantly increased over time in the control group (b = .51, se = .19, p < .01).
Estimated Means and Standard Deviations by Study Arm from GEE linear model

**MEASURE**: UNPROTECTED VAGINAL, ANAL, AND ORAL INSERTIVE SEXUAL EVENTS

Estimated (GEE) Group Means

![Graph showing estimated mean risk over time for intervention and control groups.](image)

(J. Fisher et al., *JAIDS*, 2006)
We see similar patterns in the data across a number of specific types of sexual risk behavior:

- Number of unprotected vaginal, anal, and oral insertive sex events
- Number of unprotected vaginal and anal sex events
- Number of unprotected vaginal, anal, and oral insertive events with HIV- and status unknown partners
- Number of unprotected vaginal and anal events with HIV- and status unknown partners
- Number of HIV- and status unknown partners involved in unprotected vaginal, anal, and insertive oral events
- Number of HIV- and status unknown parties involved in unprotected vaginal or anal events

**SPECIFICALLY, WE FIND SIGNIFICANT TIME X CONDITION INTERACTIONS SUCH THAT THERE ARE:**

- significant reductions of risk over time (or trends) in the treatment condition
- significant increases in risk over time in the control group
“With increased access to antiretroviral (ARV) treatment in developing countries throughout the world, ... there is an unprecedented opportunity to forge a comprehensive response to the global AIDS epidemic by integrating HIV prevention interventions into expanding treatment programs.”

Global HIV Prevention Working Group, 2004
Study Participants

• Sample Size: 152 (69 males, 83 females)
• Mean Age: 34
• Ethnicity: 92% Zulu, 2% Indian
• Employment Status: 71% unemployed
• Income: 56% reported not having enough money for food or basics
• Medications: 73% on ARVs
Baseline Data
(N=152)

- 47% (71) of sample reported having vaginal and/or anal sex in past 3 months.
  - Engaged in 676 vaginal and/or anal sex events.

- 35% (24) of these individuals reported having unprotected sex during one or more of these events.
  - 171 sex events (26%) were unprotected.
    - 67 events (40%) were with HIV-negative or unknown status partners.
Izindlela Zokuphila/Options for Health Intervention Methods

Recruitment, Randomization, Baseline

Intervention  \( n = 103 \)

Intervention sessions as part of clinical care  \( M = 2.5 \)

Control  \( n = 49 \)

Standard-of-care

6-month follow-up
Acceptability, Feasibility, and Fidelity

- Intervention was delivered in 99% of routine medical visits (216 of 218 visits).

- Patient exit interviews and focus groups indicated that counselors implemented the intervention in a supportive, helpful, and non-judgmental fashion.

- Counselors reported that it was easy to learn and integrate into routine visits, and acceptable and beneficial to patients.

- Intervention was delivered with fidelity and included all requisite intervention steps.
Time by Condition Interaction

Poisson multilevel regression change over time analyses.
Interaction: Event Rate Ratio = .11 (.01 - .87)

This study shows the potential of our prevention for positives intervention when adapted to the South African clinical care context.

- It is **acceptable, feasible**, may be implemented with **fidelity**, and can **change risky behavior**.

**Limitations:**
- Single site
- Potential for contamination and crossover
- Limited number of patients and counselors
- Limited intervention dosage
- Limited follow-up interval
- Self-report data
Last year, our team started work on a large NIMH-funded, randomized controlled trial of our Izindlela Zokuphila/Options for Health Intervention at 16 primary care sites in DC 22 and DC 27, KwaZulu-Natal, South Africa.
This research addresses many of the limitations of our previous Prevention for Positives studies:

- Large-scale RCT.
- Representative sample of clinical care sites (and counselors).
- Includes self-report and biological (STI) measures.
- Significant intervention dosage.
- Longer follow-up.
We hope to demonstrate that *Izindlela-Zokuphila* is a model for linking prevention with care that can be used in the context of ART rollouts that bring seropositives into care throughout Africa.
Some interventions for seropositives that may reduce new HIV infections

- Increased HIV Testing
  - Identifying Seropositives
  - Effects of Testing On Risk Behavior

- HIV Care
  - Effects of Care Initiation & Maintenance on Behavioral and Biologic Risk

- Initiating ARVs
  - Effects on Behavioral & Biologic Risk

- ARV Adherence
  - Effects of Adherence on:
    - HIV Risk Behavior
    - Biologic risk

- Traditional Prevention for Positives
  - Effects on Risk Behavior

- Next Generation HIV Prevention for Positives Interventions
IMB Model of ART Adherence
The Information-Motivation-Behavioral Skills Model of Adherence

Adherence Information

Adherence Behavioral Skills

Adherence Motivation

Adherence Behavior

Health Outcomes

Moderating Factors Affecting Adherence
(e.g. Psychological health, Unstable living situation, Poor access to medical care, services, and insurance coverage, Substance use or addiction)

Adherence Information

- Information about the regimen, about correct ART utilization, and about adequate adherence
- Information about side effects and drug interactions
- Information about heuristics and implicit theories concerning adherence

Adherence Information

Adherence Motivation

Adherence Behavioral Skills

Adherence Behavior

Health Outcomes

Moderating Factors Affecting Adherence
Adherence Motivation

- **Personal Motivation:**
  Attitudes/Beliefs about outcomes of adherent and nonadherent behavior and evaluation of these outcomes.

- **Social Motivation:**
  Perceptions of significant others’ support for adherence and motivation to comply with significant others’ wishes.
Adherence Behavioral Skills

*Objective and perceived abilities (self-efficacy):*

- For acquiring, self-cueing, and self-administering ART medications
- For incorporating one’s ART regimen into the social ecology of one’s daily life
- For minimizing side-effects
- For updating ART adherence related facts as necessary
- For acquiring social support and instrumental support for adherence
- For self-reinforcement of adherence over time
Adherence Behavior

- **Proper dosing**: Percentage of ART medication pills taken over number prescribed

- **Optimal adherence**: Consistent with requirements of ART medications in question.

- Adherence levels over time
Health Outcomes

- Viral load
- Drug resistance
- CD-4 counts
- Objective health status
- Subjective health
Support for the IMB Model of Adherence
Adherence-Related Information

Adherence-Related Motivation

Adherence-Related Behavioral Skills

Adherence
1 Optimal (≥ 95%); 0 Suboptimal (< 95%)

0.108

0.420*

0.477*

0.597*

0.151

0.094

Puerto Rico Study
(200 HIV Positive Patients in San Juan, Puerto Rico)

Adherence-Related Information

Adherence-Related Motivation

Adherence-Related Behavioral Skills

Adherence
1 Optimal (≥ 95%); 0 Suboptimal (< 95%)

Some Effective Adherence Enhancement Interventions using the IMB Model of Adherence

• Margolin et al. (2003)
• Kalichman et al. (2005)
• Mannheimer et al. (2006)
• Wagner et al. (2006)
• Pearson et al. (2007)
• Parsons et al. (2007)
• Pearson et al. (2008)
A CD-Rom Based ART Adherence Promotion Intervention
LifeWindows is a highly personalized and interactive software program.

It assesses each participant’s specific barriers to adherence and then provides them with a tailored list of strategies and interventions to work on.

LifeWindows sessions take approximately one hour to complete.

Participants interact with LifeWindows on an ongoing basis (at each clinical care visit).
A brief tutorial instructs participants on how to navigate within the LifeWindows environment.
Tutorial

Assessment

Goal Evaluation*

Strategy Selection*

Intervention Selection*

Intervention*

Goal Setting*

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

* Intervention condition only
Based on their IMB deficits, participants are provided with a tailored list of adherence-promoting strategies.
• After selecting a strategy, participants are given a list of strategy-specific interventions and are asked to choose one.
A total of 20 different interventions address adherence-related IMB deficits

Participants can explore interventions at their own pace

* Intervention condition only
Information-Based Interventions
My HIV Medications

**Brand Name:** Crixivan®

**Drug Company:** Merck & Company

**Other Names:** indinavir, IDV

**Type:** Protease Inhibitor (PI)

- 200 mg Capsule
- 333 mg Capsule
- 400 mg Capsule

**General Information**

**How Often Taken:**
Two or three times a day, depending on dosage prescribed.

**Food and Drink:**
Take on an empty stomach (no food two hours before or one hour after dosing), or with a light, low-fat snack. Drink at least 48 ounces (six 8-oz. glasses) of water daily to prevent kidney stones.

**Alcohol:**
It is better to avoid alcohol while taking Crixivan because it increases your risk of kidney stones. Cutting down on or avoiding alcohol is better for your health if you are taking HIV medications.

**Storing It:**
Store in a tightly closed container in a dry place (protected from moisture) and at room temperature (68°F to 77°F). It is best to store Crixivan in the original bottle with the desiccant (small container of powder) still in it.

**What It Does:**
Stops T-cells infected with HIV from making new copies of the virus.
STEP 1: Click on a question
STEP 2: Click on a doctor

Importance Of Taking All Of Your HIV Medications

- How do medications affect a person's viral load and T-cells?
- Why is it important for people to take their HIV medications as prescribed?
- Should a person ever stop taking just one of their HIV medications?
- What happens when you miss doses of your HIV medications?
- As long as a person is feeling healthy, is it okay for them to miss a dose of their HIV medication?
Motivation-Based Interventions
Positive Voices: People Living With HIV

STEP 1: Click on a question
STEP 2: Click on a person

Your Question
(Click on any question, then select a person who is highlighted in color.)

- What strategies do you use to help you take your HIV medications as prescribed?
- How do you deal with taking your HIV medications when other people are around?
- What would you say to people who are taking HIV medications and continue to drink alcohol or use street drugs?
- How do you stay motivated to take your medications every day?
- How do you manage to keep taking your medications when you feel lousy?
Videos:
- Coming to Terms with Changes in Looks
- Dealing with Fear
- The Inner Battle
- Treatment Options for Lipohypertrophy
- Working with your Healthcare Provider
This and additional information can also be found by calling 211 or by going to www.infoline.org.

- Support for taking your medications
- Support for living with HIV
- Support for dealing with alcohol or substance use
- Help with getting housing
- Help with feeling better emotionally
- Support for spiritual enrichment
Behavioral Skills Based Interventions
Side Effects: Specific side effects

- Hair Loss
- Memory and Thinking Problems, Nightmares, Trouble Sleeping
- Headaches, Fever
- Skin Problems
- Altered Taste, Dry Mouth, Fungal Infection, Mouth Sores or Ulcers
- Lactic Acidosis, Heartburn
- Anemia, Leukopenia/Neutropenia
- Muscle & Joint Pain
- Nausea & Vomiting
- Anorexia, Fatigue, Lipodystrophy, Weight Loss
- Liver Damage
- Metabolic Disorders, Pancreatitis
- Diarrhea, Gas or Flatulence
- Kidney Stones
- Neurpathy (Numbness & Tingling)
- Metabolic Disorders, Pancreatitis
- Menstrual or Period Disorders

Select One:

- Metabolic Disorders
- Pancreatitis
The Power of Paper
Write down your questions and concerns before your visit.
Write down answers to your questions during your visit.

List of questions shows you...

- Put thought into meeting.
- Spent time preparing.
- Take the discussion seriously.
Participants are asked to 1) set an adherence-related goal and 2) try to accomplish the goal before their next LifeWindows session.
LifeWindows Outcomes
**LIFEWINDOWS**

**SUMMARY OF ALL OUTCOMES - HLM**

Coefficients and (p level based on robust SE)

<table>
<thead>
<tr>
<th>OUTCOME</th>
<th>FOR ON PROTOCOL SAMPLE WITHOUT TREATMENT INTERRUPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>90% ACTG</td>
<td>.001241 (.042)</td>
</tr>
<tr>
<td>100% ACTG</td>
<td>.001252 (.029)</td>
</tr>
</tbody>
</table>
ON PROTOCOL Sample (Non-interrupted patients who Completed 6 or more sessions)

Valid Sample | ARM Coefficient | Robust SE probability
---|---|---
N=342, Obs=2,816 | .001241 | .042

FOR THE UNINTERRUPTED ON PROTOCOL SAMPLE

On Protocol No interrupt Tx ARM
On Protocol No interrupt Ctrl Arm

ACTG Optimal (90%) ADHERENCE
ACTG PERFECT (100%) ADHERENCE FOR THE UNINTERRUPTED ON PROTOCOL SAMPLE

<table>
<thead>
<tr>
<th>Valid Sample</th>
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<th>Robust SE probability</th>
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</tr>
</tbody>
</table>

ON PROTOCOL Sample (Non-interrupted patients who Completed 6 or more sessions)
• Quarraisha Abdool Karim
• Demi Adelaja
• K. Rivet Amico
• Bill Barta
• Sarah Christie
• Richard Colon
• Deborah Cornman
• Rebecca Ferrer
• Jeffrey D. Fisher
• William Fisher
• Gerald Friedland
• Janet Frohlich
• Timothy Gorin
• Zandile Jojo
• Barry Kistnasamy
• Susan Kiene
• Umesh Lalloo
• Anthony Lemieux
• Sue MacDonald
• Gethwana Mahlase
• Morris Ndlovu
• Ntombenhle Ngcabo
• Wynne Norton
• Becky Ortiznez
• Sandy Pillay
• Caroline Redding
• Lindsay Shepherd
• Paul Shuper
• Laramie Smith
• Cindy Trayling
• Francios van Loggerenberg
• Lindiwe Xulu
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