

# Adaptation of an Evidence-Based Intervention Targeting HIV-Infected Prisoners Transitioning to the Community: The Process and Outcome of Formative Research for the Positive Living Using Safety (PLUS) Intervention

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## Abstract

No evidence-based interventions (EBIs) have been designed for implementation during the critical period when HIV-infected prisoners are being transitioned from prison to the community. We therefore conducted formative research aimed at systematically selecting and adapting an EBI that integrates HIV risk reduction and adherence to antiretroviral therapy to implement among HIV-infected prisoners transitioning back to the community. Our formative research involved a critical examination of established EBIs and associated published reports complemented by data elicited through structured interviews with key stakeholders in community and correctional settings and members of the target population. Between September 2006 and February 2007, structured one-on-one interviews were conducted with key stakeholders in the target organizations ( $n = 19$ ) and with members of the target population ( $n = 26$ ) in Hartford and New Haven, Connecticut. Based on the formative research, we abbreviated and adapted the Holistic Health Recovery Program targeting people living with HIV (HHRP+), an EBI, to consist of four 45-minute sessions that cover a range of prespecified topics so that participants may individually apply intervention content as needed to their own HIV risk profile and antiretroviral adherence issues. The EBI was adapted so that it could be provided in an individual or group format and delivered in either consecutive or weekly sessions and so that it could be provided within the prison system and delivered just prior to release, or in a community-based setting where it could be delivered immediately after release. This study provides a comprehensive exemplar of the process of selecting and adapting an EBI taking into account both empirical evidence and input from target organization stakeholders and target population members in real-world settings where high-risk populations are concentrated.

## Introduction

AS MANY AS 25% of the entire HIV-infected population in the United States pass through the correctional system each year, resulting in HIV prevalence among prisoners being seven times greater than that of the general population.<sup>1-4</sup> The high prevalence of HIV behind bars is a consequence of the high rate of injection drug users (IDUs) who interface with the correctional system secondary to increased drug- and property-related offenses and to minimum mandatory sentences for repeat offenders. During incarceration, overall health often improves dramatically among HIV-infected inmates as demonstrated by the strong positive association

between length of incarceration and health and well-being.<sup>5,6</sup> Reentry to the community after imprisonment, however, is typically characterized by a significant decline or absence of adequate health care for HIV-infected prisoners and this translates to serious threats to individual and public health.<sup>6,7</sup> Thus, one of the most pressing issues facing both the correctional and community health care systems today is assisting inmates to maintain the HIV-related health benefits they have been able to achieve as they transition away from the highly structured prison setting.<sup>5</sup>

A comprehensive review of case management interventions in four states has demonstrated initial success in terms of linking patients to their first medical appointment and

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providing for emergent unmet needs.<sup>2,8</sup> Despite these initial successes, long-term outcomes remain unclear since studies have not conducted follow-ups with patients who are not retained in clinical care nor examine other important outcomes including clinical progression of HIV (i.e., viral load or CD4 levels). Data also suggest that despite transitional case management programs, critical outcomes including adherence to antiretroviral therapy tend to worsen dramatically upon release from prison.<sup>7</sup> Furthermore, HIV-infected prisoners demonstrate disturbing levels of HIV risk behavior soon after release,<sup>5,7,9</sup> thus raising public health concern about ongoing HIV transmission to the community, particularly with regard to resistant strains of HIV.

A number of evidence-based behavioral, medical, and structural interventions have been developed for HIV-infected drug users in community settings<sup>10,11</sup> and in prisons.<sup>2</sup> Despite preliminary evidence of positive attitudes among prisoners about participating in HIV testing and care while in transition from jails and prison to the community, and preliminary indications of the feasibility of delivering such care,<sup>12</sup> however, no evidence-based interventions (EBIs) have been tailored for implementation during this critical time period.<sup>13</sup> As an initial step toward addressing this unmet need, we conducted formative research aimed at adapting an evidence-based behavioral HIV risk reduction and antiretroviral adherence intervention for use during the transition period among soon-to-be released and newly released HIV-infected prisoners. This process and our findings, including the resulting intervention, are outlined below.

## Materials and Methods

### *Formative research: review of EBIs*

In preparation for implementing an HIV risk-reduction intervention among soon-to-be-released and newly released HIV-infected prisoners, our formative work first involved a critical examination of established evidence-based interventions (see [www.effectiveinterventions.org](http://www.effectiveinterventions.org)) and associated published reports. Our goal was to select an EBI that was most applicable to the target population of soon-to-be-released and newly released HIV-infected individuals; the overwhelming majority of HIV-infected prisoners have significant histories of substance use disorders. We also sought to select an intervention that could be adapted as needed for implementation within correctional and community settings so that intervention participation could occur as targeted individuals are transitioning from prison to the community.

**Review of EBIs.** Our initial step was to review EBIs applicable to our target population of HIV-infected persons with a history of drug use (see [www.effectiveinterventions.org](http://www.effectiveinterventions.org); Table 1). Based on our target population, the rank ordered criteria we used to evaluate EBIs were the extent to which an intervention: (1) included content designed to address sex-risk, drug-risk, and antiretroviral adherence behavior, (2) is designed for the target population of HIV-infected males and females with a history of drug use, (3) is theory-driven, (4) has been applied to a range of relevant ethnicities/populations, (5) is adaptable, if needed, or can be implemented in the current form.

Based on our evaluation, we determined that the Holistic Health Recovery Program for HIV-infected persons (HHRP+<sup>14</sup>)

best matched our criteria (Table 1). We noted that the theory-driven (Information-Motivation-Behavioral Skills<sup>15</sup>) HHRP+ based interventions have demonstrated effectiveness in key outcomes including reduced drug- and sex-related HIV risk behaviors when tested in randomized controlled trials (RCTs) in community-based treatment settings analogous to those in which HIV-infected prisoners may access upon release.<sup>14</sup> Specifically, in a RCT in which HHRP+ was compared to an “active” control condition (Enhanced Methadone Maintenance Program or EMMP), HHRP+ participants showed significantly greater improvements across a range of behavioral outcomes including: (1) sex-related risk reduction (i.e., reported lower frequency of unprotected sex as assessed by the Risk Assessment Battery; RAB<sup>16</sup>); (2) drug-related risk reduction (i.e., decreased illicit drug use as assessed by thrice weekly urine toxicology tests for opioids and cocaine metabolite; reported reduced needle sharing as assessed by the RAB<sup>16</sup>); (3) improved drug- and sex-related risk reduction skills as assessed by videotaped/double-blindly rated participant demonstration of proper needle cleaning and proper application of a latex condom to a penis replica; (4) reduced scores on the well validated addiction severity index (ASI<sup>17</sup>; a global indicator of drug-related consequences); and (5) improved adherence to antiretroviral medications. Margolin and colleagues<sup>14</sup> found that this pattern of outcomes remained relatively stable following the intervention period. For example, compared with participants in the active control condition, HHRP+ participants were significantly less likely to provide opiate-positive or cocaine-positive urine samples at the 9-month follow-up (odds ratio [OR] = 2.35,  $p = 0.05$  and OR = 2.21,  $p = 0.09$ , respectively) and showed significantly decreased addiction severity at the 9-month follow-up,  $F(1, 87) = 4.22, p = 0.04$ . HHRP+ participants were also more than three times less likely to report engaging in unprotected penetrative sex at the 9-month follow-up (OR = 3.94,  $p = 0.05$ ). No differential effects were found as a function of gender or race/ethnicity status.

Importantly, the HHRP-based intervention approach was specifically tailored to accommodate many of the characteristics of the target population—such as a high prevalence of cognitive impairment—that can impede their ability to benefit from behavioral interventions.<sup>18</sup> The content of HHRP+ was also found to be compatible with the needs of the target population, actively addressing both sex- and drug-related risk behavior, as well as antiretroviral adherence. Furthermore, a recent feasibility study within a community-based drug treatment program indicated that the content of HHRP+, which was originally design as a comprehensive intervention approach, could be substantially abbreviated and adapted to accommodate real world organizational constraints without losing intervention potency.<sup>19</sup> Other EBIs that were critically examined (Table 1) were deemed less suitable when accounting for all five evaluation criteria.

### *Formative research: elicitation interviews*

Our evaluation of EBIs was complemented by information gleaned through structured interviews with treatment providers within target correctional and community-based treatment settings as well as with HIV-infected prior prisoners with a history of drug use. The objective of conducting elicitation interviews was to determine: (1) what interven-

TABLE 1. SUMMARY OF THE EVALUATION PROCESS USED IN PREPARATION TO ADAPT AND IMPLEMENT AN EVIDENCE-BASED INTERVENTION AMONG OUR TARGET POPULATION

<i>Intervention</i>	<i>Target</i>	<i>Description</i>	<i>Pros/Cons for use among target population</i>
<b>HHRP (Margolin et al., 2003; Avants et al., 2004)</b>	Injection drug users in treatment	12 group sessions of 120 minutes each	<b>Pros:</b> Evidence of drug- and sex-related risk reduction; theory-based; tailored for use with a wide range of high risk and HIV-infected drug users; multimodal delivery strategies; has shown adaptability for use in community settings; addresses HAART adherence <b>Cons:</b> Comprehensive approach is very lengthy, complex, and costly in terms of training, implementation, and monitoring.
<b>Safety Counts</b>	Drug users <i>not</i> in treatment	7 sessions (2 group sessions, 1 individual counseling session, 2/+ group social events, 2/+ follow-up contacts) over 4–6 months	<b>Pros:</b> behaviorally focused approach; theory-based <b>Cons:</b> Very complex set of intervention components to integrate within a community or prison setting; comprehensive content is relatively lengthy and costly in terms of training, implementation, and monitoring; focuses on drug-related outcome behavior; does not focus on HAART adherence; not intended for HIV-infected people.
<b>Intensive AIDS Education in Jail (Magura, 1994)</b>	Male adolescent drug users in detention	4 group sessions of 60 minutes each	<b>Pros:</b> Theory-based; focuses on drug- and sex-related risks; brief <b>Cons:</b> Developed for use with male adolescents in juvenile detention center settings; does not address HAART adherence; not intended for HIV-infected people.
<b>Behavioral Skills Trng (Eldridge, 1997)</b>	Drug-using court ordered women in inpatient tx	Group level intervention for women	<b>Pros:</b> Behavioral skills training approach <b>Cons:</b> Aimed at reducing only sex-related risk; specifically tailored for use with women referred by court for inpatient drug treatment; does not focus on HAART adherence.
<b>AIDS/Drug Injection Prev. (Des Jarlais, 1992)</b>	Heroin sniffers	4 group sessions of 90 minutes each	<b>Pros:</b> Relatively brief, theory-based <b>Cons:</b> Primary focus of content is on keeping heroin sniffers from converting to injecting drugs; no evidence found for sex-related risk reduction; content is outdated; no HAART adherence content.
<b>Informational and Enhanced AIDS Education (McCusker, 1992)</b>	IDUs at inpatient detox	6 group sessions of 60 minutes each then a 30 minute individual session	<b>Pros:</b> Addresses drug- and sex-related risk; moderately brief (390 minutes); theory-based <b>Cons:</b> Provides primarily AIDS education (information); content is outdated regarding drug-related risks; delivery style is primarily verbal/psycho-educational; no HAART adherence content.

(Continued)

TABLE 1. (CONTINUED)

<i>Intervention</i>	<i>Target</i>	<i>Description</i>	<i>Pros/Cons for use among target population</i>
<b>d-up: Defend Yourself!</b> (Kenneth Jones, 2008)	Black Men who have sex with men (MSM)	4 weekly sessions for small groups of opinion leaders	<b>Pros:</b> Brief; makes use of respected peer leaders to change norms around sex-risk <b>Cons:</b> Success depends on enlistment and performance of opinion leader trained to change risky sexual norms within their own network; targets primarily African American MSM; does not focus on drug-risk or HAART adherence
<b>Focus on Youth + ImPACT</b> (Galbraith, 1996; Stanton, 2004)	Black youth (12–15 years old) with a component for parents	8 Session group intervention with 90 minute one on one parental intervention	<b>Pros:</b> Designed to enhance knowledge about STD including HIV and improve communication skills <b>Cons:</b> Very population- and age-specific; significant amount of content is not applicable to adults (e.g., emphasis on parental monitoring); no HAART adherence content.
<b>Healthy Relationships</b> (Kalichman, 2001)	Men and women living with HIV/AIDS	5 session small group level intervention	<b>Pros:</b> Brief; Aimed at HIV-infected people and their relationship issues such as disclosure/communication with family/friends and sexual partners, and safer, healthier relationships. Includes issues surrounding HAART adherence. <b>Cons:</b> Not readily applicable to people with a history of drug use; does not focus on drug-risk reduction
<b>Many Men, Many Voices</b> (Kelly, 1989)	Black MSM who may or may not identify (down low) themselves as gay	7, 2–3 hours session group (6–12) level intervention	<b>Pros:</b> Addresses cultural, social and religious norms that may influence sex-risk behaviour behavior <b>Cons:</b> Aimed specifically at African American MSM; does not focus on drug-risk reduction or HAART adherence.
<b>MIP (Robles, 2004; Marrero, 2005)</b>	Injection drug users (IDU)	7 one on one counseling sessions over 3–6 months	<b>Pros:</b> Theory-driven intervention with holistic behavioral approach; targets drug using populations. <b>Cons:</b> Very lengthy to implement and monitor progress (takes 3–6 months to complete); no HAART adherence content.
<b>MPOWERment</b> (Kegeles, 1996)	Young MSM (18–29 years)	A core group of young MSM and staff run formal and informal outreach; group meetings and publicity campaign	<b>Pros:</b> Effective sex-risk reduction intervention; creative use of outreach <b>Cons:</b> Targets young MSM; complex design; includes multiple components which require specific methods and venues; does not address drug-risk reduction or HAART adherence content; not intended for HIV-infected people.

TABLE 1. (CONTINUED)

<i>Intervention</i>	<i>Target</i>	<i>Description</i>	<i>Pros/Cons for use among target population</i>
<b>Partnership for Health (Richardson, 2004)</b>	HIV patients in outpatient settings	3–5 minute Provider initiated and delivered intervention during routine clinic visits	<b>Pros:</b> Brief, provider-initiated; designed to reduce sexual risk by promoting safer sex skills and improve communication about HIV serostatus among HIV infected participants in an outpatient setting. <b>Cons:</b> Does not address drug-risk reduction; not intended for drug using populations
<b>Popular Opinion Leader (Kelly, 1991)</b>	At risk HIV social networks and communities	Weekly group level session for POLs outreach by POLs in between those sessions	<b>Pros:</b> Theory driven intervention that utilizes popular opinion leaders to endorse and deliver risk reduction messages within their network. <b>Cons:</b> Does not target any specific population; lengthy to complete; does not focus on HAART adherence; not intended for HIV-infected people.
<b>PROMISE (CDC, 1999)</b>	At risk HIV/STD Community	Peer advocates are recruited and trained to distribute role model stories, prevention materials among their social networks	<b>Pros:</b> Based on proven behavioral theory ( <i>stages of change</i> ) that can be applied to community level HIV risk. <b>Cons:</b> Requires adaptation/ modification each time it is used in a different community; requires community collaboration; does not focus on HAART adherence; not intended for HIV-infected people.
<b>RAPP (Lauby, 2000)</b>	Women of reproductive age and their sexual partners in high risk HIV community	Peer-led outreach, one-on-one brief discussion sessions and small group discussions/ presentations	<b>Pros:</b> Aimed at reducing HIV risk through heterosexual transmission by increasing condom use among at risk population. <b>Cons:</b> Not theory-driven; only applicable to heterosexual women and their male partners; does not focus on HAART adherence.
<b>RESPECT (Kamb, 1998)</b>	Any population at risk for HIV/STD	2 individual level interactive brief counseling sessions	<b>Pros:</b> Theory-driven; brief; individual-level client-focused intervention with emphasis on teachable moments. <b>Cons:</b> Generalized design; needs substantial adaptation for specific populations; not designed for HIV-infected people; does not focus on HAART adherence.
<b>Safe in the City (Warner, 2008)</b>	STD Clinic patients	A 23-minute video shown in STD clinic waiting room	<b>Pros:</b> Very brief and community-friendly; addresses sexual risk among diverse group of STD clinic patients. <b>Cons:</b> Not intended for HIV-infected people; does not focus on HAART adherence; not clearly theory-driven.
<b>SISTA (DiClemente, 1995)</b>	African American women at risk for HIV	5, 2-hour group level intervention	<b>Pros:</b> Multiple theory-driven intervention; targets sexual risk among at risk heterosexually active African American women.

(Continued)

TABLE 1. (CONTINUED)

<i>Intervention</i>	<i>Target</i>	<i>Description</i>	<i>Pros/Cons for use among target population</i>
<b>Street Smart (Rotheram-Borus, 1997)</b>	Runaway and homeless youth aged 11 to 18	8, 1.5–2 hours group level session over 6 to 8 weeks; one individual session and one visit to CBO who provides health care	<b>Cons:</b> Primarily applicable to heterosexually active African American women; not intended for HIV-infected people; does not focus on HAART adherence. <b>Pros:</b> Addresses sexual and drug related risk behavior among a range of racial and ethnic groups. <b>Cons:</b> Complex design involving multiple components and methods; not brief or community-friendly; focuses on a very narrow population; does not focus on HAART adherence.
<b>Together Learning Choices (Rotheram-Borus, 2001)</b>	Young people (13–29 years) living with HIV	Small group level highly participatory sessions	<b>Pros:</b> Addresses sexual risk, drug risk, and substance abuse among HIV-infected people. <b>Cons:</b> No emphasis on HAART adherence; focuses on young age groups only; not readily adaptable to other age groups; not clearly theory-driven.
<b>VOICES/VOCES (O'Donnell, 1998)</b>	Heterosexual African American and Latino STD clinic clients	Group level video-based single session intervention with facilitated discussion	<b>Pros:</b> Very brief; targets sexual risk among at risk men and women of color; not clearly theory-driven. <b>Cons:</b> Messages are tailored toward heterosexual men and women of color; may not readily apply to sexual risk in other populations at risk or drug-risk behavior; does not focus on HAART adherence.

Source: [www.effectiveinterventions.org](http://www.effectiveinterventions.org).

HAART, highly active antiretroviral therapy; STD, sexually transmitted disease.

tion content would be most relevant based on target participants' HIV risk behavior profiles; (2) what intervention design characteristics—including modality and duration—would be most feasible to implement; and (3) what would be the optimal intervention placement and source of participant referral within the target organizations (Tables 2 and 3).

**Participants.** Between September 30, 2006 and February 15, 2007, structured one-on-one interviews were conducted with key stakeholders in the target organizations ( $n = 19$ ) and with members of the target population ( $n = 26$ ). Key stakeholders included medical and drug treatment providers within the Connecticut Department of Correction and within community-based drug treatment settings within Hartford and New Haven, where newly released HIV-infected prisoners in Connecticut frequently seek treatment upon release. Treatment provider participants were recruited through the administrative leadership within the Connecticut Department of Correction (DOC) and target community-based treatment programs based on the degree to which they assisted in the HIV-related care of the target population. Our objective was to interview treatment providers with a range of experience assisting HIV-infected inmates with their HIV-focused health care while incarcerated as well as providers with experience

TABLE 2. STRUCTURED INTERVIEW INSTRUMENT FOR COLLECTING DATA FROM THE TARGET POPULATION PARTICIPANTS

<i>Item</i>	<i>Question</i>
1.	How do you think most inmates contracted HIV? Sex or injection drugs?
2.	While in prison, how did you feel about others knowing your HIV status?
3.	While you were in prison, do you remember receiving any HIV education? Specifically about how to prevent HIV?
4.	Do you think that prior inmates with HIV still have sex? And if so, are they safe?
5.	Do you think that prior inmates with HIV still use injection drugs? And if so, are they safe?
6.	What do you think are some of the barriers to using condoms and cleaning needles or using new needles?
7.	Do you think that a lot of injection drug users share needles? What are the reasons for this?
8.	Do you think that programs for HIV education are helpful?
9.	What other information should we consider in creating a better HIV prevention program for prisoners about to be released?

TABLE 3. STRUCTURED INTERVIEW INSTRUMENT FOR COLLECTING DATA FROM TREATMENT PROVIDER PARTICIPANTS

Item	Question
1.	What type of intervention would work best (e.g., individual, group)?
2.	How long should each session last?
3.	What mode of presentation would work best (psycho-educational, powerpoint, handouts)?
4.	Do most HIV-infected inmates have a history of drug use? What percent?
5.	If this intervention works well and is to be sustained in this facility, who would be the best people to carry it out and evaluate it?
6.	Describe the optimal way for prisoners to be referred for participation in the intervention.

assisting newly released inmates with HIV-related health care in the context of drug treatment. Employment characteristics of treatment provider participants were as follows: infectious disease nurses (31%), addiction counselors (21%), HIV counselors (11%), transitional case managers/social workers (11%), supervisors of health services programs within Connecticut DOC (16%), and supervisors of treatment programs within community-based treatment programs (10%). The demographic characteristics of treatment provider participants were as follows: female (74%), African American (37%), Caucasian (63%), and age range 37 to 58 years (mean age = 51). Target population participants were volunteers who were confidentially recruited through their treatment providers based on the degree to which they matched our target population of HIV-infected males and females with a history of incarceration related to drug use. Our objective was to interview individuals participating in community-based drug treatment programs who shared key characteristics with our target population. The characteristics of the target population participants were: female (58%), African American (46%), Caucasian (54%), age range 34 to 59 years (mean age = 42), HIV-infected (100%), participating in drug treatment (100%), and recent history of drug use (100%). The study protocol was approved by the Investigational Review Board (IRB) at the University of Connecticut.

**Instrument and procedures.** The instruments used to obtain interview data were designed to be brief, structured, but relatively open-ended (Tables 2 and 3). As participants were informed, the interview questions were intended to elicit a range of information that could guide our refinement of an HIV risk reduction program that could be optimally implemented as inmates were being prepared for release to the greater Hartford or New Haven, Connecticut, communities. Thus, some items focused on the HIV risk profiles of the target population while other items focused on ways to optimize intervention content and placement. Trained doctoral and master's level researchers conducted the interviews as well as content analysis of the interview data.<sup>20</sup> Based on content analyses performed, the primary themes were identified and are summarized below separately for prior prisoners and treatment providers.

## Results

### *Interviews with the target population*

In order to determine what would be the most relevant intervention content, we initiated our interviews by asking target population participants to describe how they believe they had contracted HIV. The majority of participants reported that they believed it was through unsafe sexual practices. Most were uncertain, however, since all reported a history of injection drug use and many reported simultaneously engaging in sex- and drug-related risk behavior. Similarly, participants expressed uncertainty about how other HIV-infected inmates likely contracted HIV but assumed that it was through sex-related risk behavior. A typical response was, "... Hard to say since most of the people I know used IV drugs and also had risky sex." and "Probably through sex but most people were using IV drugs too." Thus, responses indicated that both sex- and drug-risk domains were relevant to target in an intervention for this population.

When asked whether they thought that most HIV-infected people knowingly engaged in sex- and drug-related HIV risk behaviors, the majority of participants responded affirmatively. All participants reported that they believed that all of the HIV-infected people they know have continued to have sex since learning their HIV-infected status and over half said they believe that most of these individuals do not always practice safe sex. Similarly, participants stated that all of the HIV-infected injection drug users (IDUs) they know have continued to use drugs. Over half of participants reported that it is likely that these same individuals also continued to share needles or works. When asked why they thought that the HIV-infected people they know have continued their HIV risk behavior, participants provided responses such as, "Most people just don't think about it or don't care enough to use condoms" and "They don't clean needles because they don't want to wait to use and they don't buy new needles because they are afraid of being labeled." In general, participants' responses conveyed a perception that HIV-infected people they know possess relatively low motivation to change risky behavior and thus suggest that an intervention for this population should be designed to enhance motivation to reduce both sex- and drug-related risk behaviors.

When questioned about perceived barriers to using condoms, participants emphasized the difficulty of negotiating condom use with their partner. For example, "There are deeper reasons for not using condoms... For women, the men may [start to] harass them about not using condoms so it takes away from the relationship" and "Not using condoms is a lot more about the bond between partners." Such responses not only underscore the need to enhance motivation to reduce sexual risk but to also develop the interpersonal skills required to effectively negotiate safer sexual behavior with partners. Participants reported different types of barriers associated with reducing drug-related risk such as using a syringe-exchange program (SEP). Most commonly, participants mentioned the stigma associated with being seen using such services or concerns with being arrested by police in the areas where SEPs tend to be located. Representative responses include, "People already know about [SEPs] but they just don't want to use those services because they're afraid that they will get in trouble or arrested or labeled" and "They feel like they're doing something bad so they don't want others to

know and they're on drugs so they're extra paranoid anyway." Thus, responses conveyed that in addition to possessing knowledge about the existence of drug-risk reduction services in the community, an intervention should be aimed at overcoming the associated stigma.

Participants were also asked to describe their recent experiences with HIV education programs while incarcerated. Participants reported relatively limited exposure to HIV prevention services. Representative responses were, "Pamphlets were given out during orientation but most people didn't read them" and "If you had questions about HIV or HIV programs, you could ask, but unless you asked, no one just gave you that information" as well as "At orientation, . . . everyone got a packet, but you had to ask or pay attention to the flyers if you wanted to learn about HIV." Those who reported making a formal request to participate in an HIV education group typically reported that the group focused on their experience of being HIV-infected instead of preventing further transmission of HIV. For example, "I participated in an HIV group but they didn't talk about prevention; it was all about coping" and "It was more about how to deal with having HIV." Those who reported receiving content on HIV prevention typically stated that the groups were informational or dealt exclusively with sex-related risk behavior. Common responses were "I don't remember any presentations or demonstrations [in the group meetings]" and "I remember a condom demonstration but not being shown how to clean needles the right way." Overall, these responses suggest that participants experienced relatively passive (informational) experiences with HIV prevention that emphasized sexual risk behavior and coping with HIV.

Following the elicitation of the above information, we asked participants to describe what specific type of intervention would be most helpful for implementation among soon-to-be-released or newly released HIV-infected prisoners as part of their transition back to the community. First, we sought information about whether such inmates thought that an HIV prevention intervention would be feasible and helpful during the process of transitioning from prison to community. When asked, participants responded quite positively as exemplified by, "Yes, it is important . . . because most people on the street don't really know how HIV is spread or prevented and they go on hearsay" and "Yes, I think it would be helpful because people would have more of a chance to talk and ask questions about HIV." Thus, participants tended to strongly endorse the concept of including an HIV prevention intervention as part of the process of transitioning inmates to the community.

When asked to provide any other information we should consider in attempting to create an optimal HIV prevention intervention, most participants suggested that they would prefer participating in a group-level intervention rather than individual sessions although most also stated that they had concerns about maintaining privacy regarding their HIV status. Typical responses were, "I think more people would be willing to come to a group . . . because, with a group, you know that you're not alone [in your HIV status]" and "I personally would like a group because I would get to open up about things in a way that I couldn't with other groups because everyone would be HIV-positive." Related to this, however, some participants advised that it might work better to offer people the choice of attending the intervention in a group or individual format as conveyed by, "I think that you

should give the option to participate in a group or have the sessions individually so everyone could pick which way they feel more comfortable." Participants also offered their views about how the intervention content should be delivered. Most suggested the use of videos and PowerPoint presentations as teaching tools and discouraged the use of handouts because they believed that many people would not want to be identified by them (i.e., identified as participating in an intervention targeting HIV-infected persons) and would therefore just throw them away or not refer to them again. Thus, in contrast to what they reported experiencing while incarcerated, participants suggested designing an intervention that was more engaging and active as opposed to primarily informational.

The information obtained from prior prisoners was complemented by information collected from treatment providers (Table 3). This provided another perspective with regard to intervention content and delivery and also allowed us to consider issues surrounding the logistics of incorporating such an intervention in the transition process.

#### *Interviews with treatment providers*

We initiated these interviews by asking treatment providers what type of intervention format they thought would work best given both the participant population and the organizational constraints. Most treatment providers preferred a group format, but suggested that many participants may not be comfortable in a group due to confidentiality issues surrounding their HIV status, as exemplified by, "A group might be more helpful but it would be best to let them choose between a group or individual sessions" and "A group may be more practical but individual sessions would probably be a more comfortable setting for participants." Some providers, however, did not think that confidentiality was a barrier to conducting the intervention in a group format as indicated by, "Groups would not be a problem because disclosure of HIV status and confidentiality are not a big issue" and "Confidentiality of HIV status is not an issue because most inmates I work with are already open about their status." Thus, although providers tended to agree that a group format would be a more practical means of intervention delivery, they expressed somewhat mixed views about the extent to which a group format would be feasible for most participants.

When asked about the recommended length of each session, treatment providers indicated that 35–45 minutes per meeting would be a reasonable amount of time for participants to remain engaged whether the meetings were conducted within the prison or in a community-based program following release. Related to this, treatment providers favored the use of power point presentation slides and video clips as ways to deliver the intervention content in order to optimally engage participants' attention. In addition, providers emphasized the need to tailor the intervention content—including slides, handouts, and videos—to fit the educational level of the audience which they agreed was typically eighth to tenth grade level. Representative responses include, "PowerPoint is a good idea because participants look forward to any new type of stimulation and varied modes of presenting information" and "Make sure they are engaged by the presentation and that it is tailored to the right educational level."

Responses also conveyed the need to take in consideration the existing knowledge base of the participants regarding



HIV/AIDS and, thus, not to present very basic information about HIV/AIDS as exemplified by, “Need to consider the skill level of the audience—don’t make sessions too basic or they will lose interest.” Treatment providers also indicated that, while many participants may not know for certain how they were infected with HIV, they believed many would have a history of sex- and drug-related risk behavior, and could therefore benefit from content addressing both risk domains as well as content aimed at encouraging HAART adherence. Overall, treatment providers’ responses suggested that the intervention should be relatively brief, delivered in an engaging manner using power point presentation slides and video clips, and carefully tailored to accommodate participants’ knowledge, education level, and risk behavior experiences.

Finally, we were interested in eliciting treatment providers’ views about the optimal organizational placement of the intervention including who would most likely facilitate the referrals and delivery of the intervention. Treatment providers tended to agree that, if the intervention were placed within the prison setting, it would make most sense for referrals to be made through the medical unit since these providers are charged with managing the HIV-focused care of inmates. Responses indicated that, for example, the addiction unit staff may not be aware of inmates’ HIV status or participate in HIV-related care while the counseling and testing unit staff only have contact with (relatively few) newly diagnosed HIV-infected inmates. Thus, while it may seem unfortunate that HIV-focused care tends to be limited to the medical unit, and therefore not integrated into an inmate’s overall treatment plan, providers agreed that it would not be feasible to place an HIV prevention intervention in any other part of the prison organization. Similarly, providers indicated that, within community-based treatment programs, the intervention should be placed in a manner that did not force participants to disclose their HIV status.

### Intervention design

Given the responses elicited from prior prisoners and treatment providers, it did not appear feasible to directly adopt and implement a comprehensive intervention approach within the prison system or within a community-based treatment program. Thus, given the parameters that were suggested—particularly the duration per session and the need to make the mode of delivery (group or individual) the choice of participants—it seemed more practical to abridge the intervention content to focus explicitly on HIV risk reduction and antiretroviral adherence, and to redesign the delivery approach so that it could be conducted in a group or individual format. Thus, the final goal of the intervention adaptation process was to preserve the style and process of HHRP+<sup>15</sup> while abridging content and adjusting delivery based on the information gleaned from the structured interviews.

We also examined issues pertaining to the strategic placement of the intervention. This process was largely determined by the logistics of the target organizations as described in the interviews by the participating treatment providers. The key factors that we considered were (1) how the intervention could be made available to a maximum number of target participants, (2) how it could be positioned to be perceived by participants and staff as relevant to overall health care, (3) how it

TABLE 4. OUTLINE OF THE HIV RISK REDUCTION AND HAART ADHERENCE INTERVENTION THAT RESULTED FROM FORMATIVE RESEARCH WITH TARGET POPULATION AND TREATMENT PROVIDER PARTICIPANT

<i>Group topic</i>	<i>Information, motivation, and skills taught</i>
Active health care participation	Understanding HIV and your immune system, strategies for improving health, developing a partnership with health care providers, and enhancing HAART adherence skills
Reducing drug-related risk	Identifying drug-related HIV-risks, learning about proper needle cleaning, and managing drug cravings
Risk reduction with condoms	Identifying sex-related HIV risks, and learning about latex products and their correct use
Negotiating risk reduction with partners	Negotiating use of latex, communicating about sex- and drug-related HIV risk

could be the least disruptive to the organization’s routine, and (4) how it could be placed so that it would be most likely to be sustained, as designed, using the existing human and physical resources available within the target organizations.

The resulting Positive Living Using Safety (PLUS) intervention (Table 4) comprises four one-on-one (or group) 45-minute sessions designed to cover a range of relevant topics so that each participant may choose to apply intervention content as needed to their own HIV risk profile and HAART adherence issues. The PLUS intervention manual was designed with flexibility so that content could be delivered in an individual or group format and so that it could be delivered in either consecutive or weekly sessions based on time constraints. It was also designed so that the intervention could be placed within the prison system where it would be delivered just prior to release, or in a community-based organization where it would be delivered immediately after release. Regardless of organizational placement, the intervention content emphasized the relevance of HIV prevention and HAART adherence as a crucial part of participants’ healthy transition back to the community.

### Discussion

This study outlines the process and outcome of formative research that we conducted in preparation to deploy Positive Living Using Safety (PLUS), a behavioral intervention, designed to address the HIV risk behavior and HAART adherence challenges faced by HIV-infected inmates as they transition back to the community. This approach is consistent with the Assessment-Decision-Administration-Production-Topical experts-Integration-Training-Testing (ADAPT-ITT) model of intervention adaptation<sup>21</sup> in which input from target organization stakeholders and target population members is systematically elicited and incorporated into the intervention adaptation process. Thus, outcomes from our formative research had a significant impact on the features of the resulting PLUS intervention, including the brevity of the intervention and duration per session, as well as modality of delivery. This information was critical in helping us refine an intervention

designed to be perceived as relevant by participants as well as practical in terms of organizational demands. Prior research has demonstrated that proactively addressing such issues reduces the need to make major adjustments to the intervention in the midst of implementation.<sup>19</sup>

The present study contributes to the literature devoted to systematically addressing the array of issues that arise in the process of transporting and adapting research-based interventions to clinical settings.<sup>14,21–24</sup> We have attempted to extend this literature by outlining a complete exemplar of the processes of intervention adaptation that we found useful for a specific high-risk population and that may inform similar efforts. The pervasive challenge faced by efforts of this kind involves adapting an evidence-based intervention in such a manner that it retains potency among the target population while accommodating itself to the resource constraints of target organizations such as prisons and community-based settings. Although various organizations may utilize the same evidence-based intervention and a similar adaptation process, what is finally determined to be the optimal approach may be expected to vary as a function of the specific target population and organizational demands<sup>21</sup> as this study also suggests.

Limitations of this qualitative study should be noted in order to place our findings in the proper context. Foremost, this study was conducted with the objective of preparing to deploy an optimally adapted EBI in clinical settings, as opposed to conducting a study with quantitative research outcomes such as a RCT, and this resulted in the limitations that are inherent in qualitative research. We believe, however, that our selection of formative research participants, a well-established analytical approach, and the incorporation of published empirical research, resulted in well-informed decisions in the intervention adaptation process. Second, although our adapted intervention, PLUS, has now been successfully deployed in prisons and community-based settings in Connecticut, it has not been evaluated in terms of quantitative outcomes. Thus, while there are strong indications of intervention feasibility, it is not yet possible to draw conclusions regarding the efficacy of PLUS.

The above limitations notwithstanding, this study suggests the potential benefits of systematically adapting evidence-based HIV risk reduction approaches by taking into consideration the real world needs and constraints of settings such as prisons and community settings where high-risk populations are found. One objective of reporting this formative research was to more fully inform future efforts as EBIs have become widely available (see [www.effectiveinterventions.org](http://www.effectiveinterventions.org)) but not necessarily widely deployable without appropriate adaptations. There is a clear need for stronger linkage between research and clinical domains in order to ensure that EBIs are successfully implemented where they are needed most, even if this means systematically adapting the original intervention in order to negotiate acceptability within target organizations.

#### Author Disclosure Statement

No competing financial interests exist.

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