Prevention With Positives: A Review of Published Research, 1998-2008

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HIV prevention education and counseling efforts have historically been directed toward those individuals considered at risk for exposure to HIV and assumed to be uninfected with HIV. In the late 1990s, prevention efforts began to include individuals who were HIV-infected. In 2003, the Centers for Disease Control and Prevention recommended that HIV prevention be incorporated into the medical care of persons living with HIV. This domain of HIV prevention work is known as prevention with positives or positive prevention, and research within this domain has been ongoing for a decade. This article provides a review of the scientific evidence within the prevention with positives domain from 1998 to 2008. A discussion is provided regarding early descriptive and formative studies as well as more recent and ongoing intervention trials specifically designed for persons living with HIV. A summary of current knowledge, a description of ongoing research, and gaps in knowledge are identified. Topics for future research are suggested.

(Journal of the Association of Nurses in AIDS Care, 20, *92-109*) *Copyright © 2009 Association of Nurses in AIDS Care*

Key words: *behavior change, HIV prevention, HIV transmission, positive prevention, research summary*

The first HIV prevention education and counseling efforts were directed toward those individuals at risk for exposure to HIV and assumed to be uninfected. These individuals were targeted to receive education on the modes of disease transmission, and risk reduction strategies focused on safer sex and drug use practices (Rio & Friedland, 2003). Despite these primary prevention efforts, there have been an estimated 40,000 new infections per year since the late 1990s (Centers for Disease Control and Prevention [CDC], 2008a; Institute of Medicine, 2001). Hall et al. (2008) recently published a revised report of the 2006 surveillance data estimating the annual rate of new infections as 56,300 per year in the United States from 2003 to 2006. This revised incidence is based on data from new assays that were able to differentiate recent infections from long-standing infections.

HIV infection and disease occur after exposure and transmission of the virus from an infected person. An estimated 1.2 million individuals were living with HIV in the United States in 2008 (Kaiser Family Foundation, 2008), but only 75% of these individuals are aware of their diagnosis (Glynn & Rhodes, 2005). Consequently, two groups of HIV-infected individuals are capable of transmitting the virus: those who are aware of their HIV status and those who have not been tested and are currently unaware of

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JOURNAL OF THE ASSOCIATION OF NURSES IN AIDS CARE, Vol. 20, No. 2, March/April 2009, 92-109
doi:10.1016/j.jana.2008.11.001

their status. After more than a decade of HIV primary prevention efforts that focused on personal risk reduction and self-protection without a significant reduction in new infections, it became apparent that different strategies would be required to combat the epidemic. Efforts were begun to direct prevention efforts toward those responsible for transmitting HIV. Programs were developed to increase the number of individuals tested and to target those individuals who were known to be infected with HIV.

This review focuses on the emerging area of prevention research targeting those individuals known to be infected with HIV. This domain of research began in the late 1990s and became known as prevention with positives. The need to address prevention in HIV-infected individuals was magnified around this time as the number of AIDS-related deaths declined dramatically in the late 1990s after the introduction of combination antiretroviral therapy (ART) in 1995. The resulting decline in mortality led to an increased prevalence of people living with HIV (PLWH) (CDC, 2008b).

As the life expectancy for PLWH increases in those individuals on ART, it has been suggested that any initial risk reduction that occurred after diagnosis was followed by a return to prediagnosis risky behaviors (Weinhardt et al., 2004). In their cohort of 3,723 HIV-infected participants, Weinhardt et al. reported that 44.7% of men who have sex with men, 36.5% of women, 34% of heterosexual men, and 52% of intravenous drug users had engaged in unprotected intercourse within the past 3 months. Numerous research studies estimate that approximately 33% of HIV-infected individuals continue to engage in behaviors that facilitate HIV transmission after diagnosis (as cited in Fisher et al., 2006).

In 1997, a National Institutes of Health (NIH) consensus panel proclaimed the need for behavioral interventions directed toward those individuals living with HIV (NIH, 1997). This approach was supported by the Institute of Medicine (2001) and followed by the CDC (2001). The CDC proposed a national initiative for HIV prevention known as the HIV Prevention Strategic Plan Through 2005. The overarching priority goal of this initiative was to reduce the annual number of new infections from 40,000 to 20,000 per year by 2005. Building on that priority, the CDC (2003) presented recommendations for incorporating HIV prevention education into the medical care of PLWH. This shift in HIV prevention efforts was apparent in the Prevention with HIV-Infected Persons Seen in Primary Care Settings initiative funded by the Health Resources and Services Administration (HRSA) in 2003. Fifteen sites across the United States were selected to participate in this HRSA-sponsored Special Projects of National Significance program (Malitz & Eldred, 2007). The majority of these projects are ongoing and are included in this review.

In May 2005, as a result of disappointing progress toward the 2005 goal, the HRSA Advisory Committee on HIV and STD Prevention and Treatment collaborated with the CDC to discuss possible solutions. The primary reason cited for poor outcomes was the lack of expanded funding on a national level that prevented full implementation of the plan (CDC, 2007). A revised plan was announced in 2007 with the short-term goal to "reduce the number of new HIV infections in the United States by 5% per year, or at least by 10% through 2010, focusing particularly on eliminating racial and ethnic disparities in new HIV infections" (CDC, 2007, p.15).

The revision of the HIV Prevention Strategic Plan through 2010 preceded the release of the CDC HIV/AIDS surveillance report by several months. Based on data collected through 2006, a point estimate of 36,817 HIV infections was reported for 2006 that represented a 1.03% increase when compared with 2005 (CDC, 2008b). The data used in the 2006 report represented the same 33 states and 5 U.S.-dependent territories with confidential name-based HIV reporting used in previous CDC HIV/AIDS surveillance reports. A more recent incidence estimation was developed from data generated using new assays that were able to differentiate recent infections from long-standing infections and corroborated with a statistical back-calculation of HIV incidence from 1977 to 2006 (Hall et al., 2008). This revised estimate of 56,300 new infections annually is considered the first direct estimate of HIV infections.

The importance of research in the prevention with positives domain cannot be overemphasized. Schackman et al. (2006) recently suggested that the average lifespan of an HIV-infected individual entering medical care in the United States with a CD4 cell

count of 350 cells/mm^3 is now approximately 24.2 years. This report also estimated average monthly medical costs for those individuals entering care with CD4 cell counts of higher than 350, lower than 350, and lower than 50 cells/mm^3. The average monthly costs reported were $2,000, $2,100, and $4,700, respectively. The average lifetime medical cost for those entering care with CD4 cells lower than 350/mm^3 range from $385,200 to $618,900 based on the current range of discounts offered for antiretroviral medications. Based on these estimates, the newly revised annual rate of 56,300 new infections has the potential to add $34.8 billion in lifetime medical costs. Both the human and financial burden of new HIV infections make prevention, specifically prevention with positives, an extremely important research area.

The purpose of this review is to describe the progress of research in the prevention with positives domain. Early formative studies are discussed, and more recent intervention studies are described with a summary of any available interim results. This review provides a report of the current knowledge in this area and is not intended to be a meta-analysis. The information can be used to inform practice as clinicians begin to initiate prevention with positives programs into HIV-care settings. Gaps in current knowledge and areas for future research are suggested.

Defining the Research Domain

Progression of the Research Agenda

Research in the domain of HIV prevention for positives is progressing slowly, as one might expect in a newly identified domain of study. Early research was dominated by descriptive studies that examined characteristics of patients, providers, clinics, and clinic visits. These early formative studies provided the foundation for the next phase of intervention research. Intervention trials may be viewed through a variety of lenses, such as the theoretical foundation used (see Table 1), design of the intervention (group vs. individual and single vs. multiple sessions), and type of professionals delivering the intervention. This review will summarize these perspectives but will highlight two distinct groups of intervention trials. One is dominated by those interventions that are delivered in the community, in multiple sessions, and facilitated by professionals other than the patient's medical providers. The second group of trials may be considered the second generation of intervention trials and coincide with the CDC (2003) recommendation that HIV prevention be incorporated into the medical care of PLWH. This more recent group of trials is dominated by interventions that use brief counseling techniques, are delivered within the clinic setting, and include the patient's provider in the delivery of the prevention message. A total of 17 intervention trials were reviewed and are summarized in Table 2. Preliminary results are available for 11 of these trials. The remaining researchers have published interim reports, program descriptions, and lessons learned that may inform practice until complete results are available.

Inclusion, Exclusion, and Search Criteria

Inclusion criteria for studies reviewed were research studies published in peer-reviewed, English language journals from 1998 to 2008, with participants in the studies being greater than 18 years of age, HIV-infected, and living in the United States. Qualitative and quantitative research designs were included. Each study focused on HIV prevention messages directed to PLWH. The search yielded a total of 87 publications. A total of 13 studies met inclusion criteria for consideration in the area of preliminary, descriptive, or formative research. A total of 17 additional studies met the inclusion criteria for the intervention trials.

Databases used included CINAHL (Cumulative Index to Nursing and Allied Health Literature), PubMed, AIDSinfo, National Library of Medicine AIDSline, and AEGIS (AIDS Education Global Information System). A cursory review of each article's reference list was also performed. The search terms (key words) used were *prevention*, *HIV prevention*, *HIV counseling*, *HIV positive*, *prevention with positives*, *prevention for positives*, *positive prevention*, *transmission*, *risk behavior*, *risk reduction*, and *harm reduction*. Searches were combined using

Table 1. Applied Theory and Counseling Methods

Theory	Authors
Social cognitive theory (Bandura, 1986, 1994)	Golin et al. (2007) Kalichman et al. (2005) Kalichman et al. (2007) Patterson et al. (2003) Wingood et al. (2004) Wolitski et al. (2005)
Transtheoretical/stages of change model (Prochaska & DiClemente, 1982)	Callahan et al. (2007) Grimley et al. (2007) Holstad et al. (2006) Nollen et al. (2007) Rutledge (2007) Zuniga et al. (2007)
Information-motivation-behavioral skills Model (Fisher & Fisher, 1992)	Fisher et al. (2006) Margolin et al. (2003) Wolitski et al. (2005)
Harm reduction theory (Spring, 1991)	Callahan et al. (2007) Zuniga et al. (2007)
Theory of gender and power (Wingood & DiClemente, 2002)	Wingood et al. (2004)
Theory of planned behavior (Ajzen, 1985)	Wolitski et al. (2005)
Theory of reasoned action (Ajzen & Fishbein, 1975)	Golin et al. (2007)
Behavioral self-efficacy (Bandura, 1977)	Zuniga et al. (2007)
Social action theory (Ewart, 1991)	Healthy Living Project Team (2007)
Counseling Methods	
Motivational interviewing (Miller & Rollnick, 2002)	Callahan et al. (2007) Fisher et al. (2006) Golin et al. (2007) Holstad et al. (2006) Nollen et al. (2007) Rutledge (2007)
Cognitive-behavioral therapies (Dobson, 2003)	Healthy Living Project Team (2007) Margolin et al. (2003) Wolitski et al. (2005)
Message framing (Rothman & Salovey, 1997)	Richardson et al. (2004) Zuniga et al. (2007)

Boolean logic to maximize the yield and minimize duplication.

Several of the studies were published in non-HIV-focused journals. These journals included *Health Psychology, Annals of Behavioral Medicine, Archives of Sexual Behavior, Behavior Modification, Journal of Primary Prevention,* and *The Online Journal of Issues in Nursing.* The HIV-focused journals represented in this collection include *AIDS, AIDS and Behavior,* and the *Journal of Acquired Immune Deficiency Syndrome.* A 2007 supplement in *AIDS and Behavior* included 13 articles reporting progress made in the HRSA-funded Positive Prevention Initiative that began in 2003.

Research Summary

Preliminary Studies

This discussion of preliminary studies focuses on those descriptive and formative studies that described current prevention efforts for PLWH during the period between 1995 and 2002. These studies were designed to examine characteristics of patients, providers, clinics, and clinic visits that informed the development of the later intervention trials. A study by Gerbert et al. (1999) was considered to be the first qualitative study to explore the domain of what eventually became known as prevention with positives. Gerbert

compared HIV transmission prevention assessment and counseling by physicians treating HIV-infected patients by interviewing 44 physicians in the San Francisco Bay area during 1995 through 1997. The authors identified two extremes of physician communication styles that they labeled as consultants or collaborators. The consultants conducted transmission prevention assessment and counseling during initial visits or when presented with medical cues such as symptoms of a sexually transmitted infection. These physicians viewed themselves primarily as an information source. The collaborators regularly conducted transmission prevention counseling and viewed themselves as actively helping patients reduce transmission risk. Physicians with communication styles between these two extremes did not conduct regular counseling themselves but often used referrals to health educators. The authors suggested that these different communication styles might influence patient behavior differently. This study was important, not only because it was the first study to look at prevention messages delivered to an HIV-infected group of patients, but also because it influenced later studies that evaluated the collaborative relationship between medical providers and their patients in terms of the effects on adherence to medical advice and risk reduction.

Other preliminary research studies incorporated surveys and interviews to describe characteristics of patients, providers, and clinics that affected the practice of HIV prevention assessment and counseling in HIV-infected patients. Wilson and Kaplan (2000) surveyed both patients ($n = 264$) and their physicians ($n = 69$) on topics related to general communication, caring and compassion, and communication about HIV-specific topics. Results from patient surveys suggested that a longer duration of patient-physician relationships and female gender of the patient were associated with better general communication skills and more participatory decision making. Patients also rated both female and homosexual physicians significantly higher in their HIV-specific communication abilities.

Marks et al. (2002) surveyed 839 PLWH during 1998 and 1999 to determine if a health care professional (physician, nurse practitioner, physician assistant, nurse, social worker, health educator, psychologist, or psychiatrist) had ever spoken with them about safer sex or HIV disclosure. The 839 participants from six public health HIV clinics in California included homosexual men ($n = 607$), heterosexual men ($n = 127$), and women ($n = 105$). The survey data showed that discussions of HIV status disclosure were less likely to occur than discussions of safer sex. Prevention discussions were more likely to occur with heterosexual men and women as well as non-White, less educated, and lower income participants. There was a large variation across the six clinics in the number of patients reporting a discussion of safer sex with at least one clinic staff member. Over 90% of patients were counseled in two of the clinics, 76% of patients were counseled in another clinic, and 58%, 56%, and 52% of patients were counseled in the remaining three clinics, for an overall average of 71%. It was suggested that barriers to communication could include a lack of provider training, a lack of time, a lack of referral mechanisms, and the attitude and motivation of clinic personnel.

Myers et al. (2004) performed a multifaceted study using both exit surveys with 618 patients and in-depth interviews with 104 administrators, providers, and patients to assess prevention with positives practices in 16 primary care Ryan White Care Act-funded clinics. These clinics represented a cross-section of geographical locations, sizes, and patient demographics. The participants were surveyed on the content of their discussions with providers on a variety of health promotion topics before specifically asking about the HIV prevention topics. Bivariate analysis of the data showed several significant relationships between the frequency of prevention counseling when compared with various patient or clinic characteristics. Combined data from all 16 clinics showed that Blacks, women, heterosexuals, sexually active individuals, individuals younger than 35 years of age, and those not currently taking ART were more likely to receive HIV prevention counseling. The clinics were also categorized by whether there were written prevention procedures to guide the provision of HIV prevention counseling (clinics = 3, patient surveys = 118), whether the providers offered prevention counseling based on their own initiative (clinics = 11, patient surveys = 396), or whether the clinic had no written or informal procedures (clinics = 2, patient surveys = 100). The frequency of HIV

Table 2. Prevention With Positives Intervention Research

Study and Location	Sample Characteristics	Study design and Evaluation Tools	Description of intervention/s	Outcome Variables and Results
Gardner et al. (2008) Seven HIV clinics located in CO, NY, NC, TN, MO, and GA (two sites). Clinics were located in health departments or university medical centers.	Convenience samples $N = 767$ (all completed all three waves of surveys)	Demonstration project with pre- and postnonexperimental design. ACASI evaluations at baseline, 6 and 12 months.	**Provider-Delivered** Providers were trained to deliver a standardized behavioral intervention: Positive STEPS.	Occurrence of unprotected anal or vaginal intercourse in the past 3 months. The 3-month prevalence of unprotected intercourse with any partners declined significantly ($p = < .001$) from baseline (42%) to first follow-up (26%) and at 12-month follow-up (23%).
Callahan et al. (2007) Three clinics in northern California: a large (1,800-patient) urban HIV clinic and two smaller rural, primary care clinics Comprehensive Harm Reduction Protocol	Characteristics not listed To date, participants have been randomized as: Brief provider message arm ($n = 61$) OR Brief provider message plus specialist sessions arm ($n = 57$).	RCT All participants complete risk diagnostic questionnaire to assess sexual and drug use behaviors associated with HIV transmission. Intervention session included assessment of participant's perception of the importance of behavior change and his or her confidence in being able to carry out the change. Total time to complete intervention is also recorded.	**Provider-Delivered** Two intervention arms. All participants had two initial provider-based prevention messages before randomization to study arms: Brief (3-5 minute) provider-based prevention message using MI at every visit OR Brief provider-based prevention messages followed by risk reduction session with an HIV health education specialist.	Risks associated with HIV transmission using risk diagnostic questionnaire assessment at every routine clinic visit (every 3-4 months). Cost of programs. Study ongoing, no interim results available.
Golin et al. (2007) Chapel Hill, NC	Convenience sampling in progress from clinic serving urban and rural areas of NC. Male = 67% African American = 61% Heterosexual = 50% MSM = 25% To date, $n = 148$, 68 randomized to receive MI counseling.	RCT Telephone interviews Measure of risky behaviors not defined in this publication	Three consecutive monthly one-on-one MI counseling sessions (each 30-45 min) delivered by MI-trained MSW.	Current phase consists of follow-up phone interviews to gather data regarding participants' reactions to the counseling sessions. Future phases will test the effect of the counseling program on risky behaviors (outcome measures not defined). Study ongoing, no interim results available.

(*Continued*)

Table 2. (*Continued*)

Study and Location	Sample Characteristics	Study design and Evaluation Tools	Description of intervention/s	Outcome Variables and Results
Grimley et al. (2007) Johns Hopkins University (JHU), Baltimore, MD University of Alabama, Birmingham (UAB)	All clinic patients are eligible in JHU study: JHU = 794 total patients Male = 542 (68%) Black = 418 (52%) White = 339 (43%) UAB = 1,257 total patients MSM only eligible Male = 952 (76%) Black = 660 (52%) White = 597 (48%) Sample characteristics not stated, study ongoing.	JHU is RCT. UAB is interrupted time series design. Participants complete an ACASI of risk factors, which also identify participant's behavioral stage or readiness to change that risky behavior.	**Provider-Delivered** JHU providers counsel on a single or multiple risk behavior. UAB providers counsel on the one risk behavior rated to be in the most advanced stage of change. Participants assessed and counseled by providers at every routine clinic visit.	Both sites will evaluate condom use, nondisclosure of HIV status, and substance abuse. JHU-specific: Needle sharing and readiness to enter substance abuse treatment program. UAB-specific: reduction of multiple sex partners. Study ongoing, no interim results available.
Healthy Living Project Team (2007) Los Angeles Milwaukee, WI New York San Francisco	Total *N* = 936 White = 32% Black = 45% Latino/Hispanic = 15% Male = 79% HS graduate or less = 44% Some college = 38% Sexual orientation not identified Los Angeles = 36% Milwaukee, WI = 9% New York = 26% San Francisco = 29%	RCT Self-report	15 90-minute individually delivered intervention sessions organized into three modules on stress, coping, and adjustment; safer behaviors; and health behaviors.	Transmission risk, as measured by the number of unprotected sexual risk acts with uninfected persons or persons of unknown HIV status. Significant difference in transmission risk between the two groups over 5-25 months (p = .007). Greatest reduction occurred at 25-month follow-up, with 36% reduction in intervention group compared with control.
Holstad et al. (2006) KHARMA Project Atlanta, GA	Convenience sampling of women only. No demographics available. Projected *N* = 216. Groups of 6 members each (36 total groups). Participants recruited from three HIV clinical care sites in metropolitan Atlanta.	RCT Self-report	Nurse-led motivational group intervention compared with nurse-led health promotion control group. Each group met weekly for 1.5 to 2 hours for 8 weeks (three sessions specific to medication adherence, three sessions on risk reduction behaviors, and one session on disclosure).	Use of risk reduction behaviors by self-report. ART adherence by self-report and MEMS caps. Study ongoing, no interim results available.

Kalichman, et al. (2007) Atlanta, GA	AIDS service organization HR-altered protocol Male = 70 Female = 22 Transgender = 6 Minority = 85 White = 13 Education < 12th grade = 24%	Program evaluation of a variation of the Healthy Relationships packaged intervention completion rates. Surveys assessed social support, group experiences, and perceptions of the facilitators.	Nongender- and nonsexual orientation-specific groups were conducted by nonmental health counselor and uninfected facilitators.	Altering group composition and facilitator matching does not alter the outcomes of the Healthy Relationships packaged intervention.
Nollen et al. (2007) New York	Center for Comprehensive Care Total patients = 2,600 Black = 65% Male = 60% Heterosexual = 76% HS diploma or less = 69%	RCT ACASI qualitative program evaluation consisting of semi-structured interviews with both intervention specialists and program staff.	Intervention arm consisted of a minimum of four MI sessions within a 6-month period. Control arm consisted of case management by an assigned social worker.	This publication presented aspects of program evaluation only. Study ongoing, no interim results reported.
Rutledge (2007) North Florida	Convenience sample from regional AIDS service organization	Qualitative Feasibility pilot Two case reports and discussion	Client-written assessment of sexual activities and related attitudes. Single session to review responses to client assessment using MI.	Concepts identified included ambivalence about disclosure and condom use; stigma, use of support groups following MI session, and need for training to assure correct MI technique in staff with varied educational backgrounds.
Zuniga et al. (2007) San Diego, CA Supporting Positive Living and Sexual Health Program	University hospital-based HIV primary care clinic Total population = 2,269 White = 53% Hispanic = 26% Black = 14% Male = 86% Gay/bisexual = 60% Heterosexual = 16% Injection drug user = 16%	Pre- and postnonexperimental design All consenting patients at every visit completed brief risk assessment, a standardized sexual and substance-use risk assessment. If risk established, participant then completed sexual health inventory and referred to SPLASH program. If referred to the HIV prevention specialist, a computerized behavioral risk staging questionnaire was administered to guide the specialist toward behaviors in the most advanced stage of change. Participant exit interviews conducted to assess fidelity of provider interventions and documentation.	**Provider-Delivered** Medical providers delivered brief (2-3 min) consequence-framed message (negative consequences of unsafe sex) to participants identified at risk from the results of the brief risk assessment. Those participants rated at higher risk were counseled by the medical provider and then referred for four counseling sessions with the HIV prevention specialist.	Reduction in number of sexual partners. Reduction in the number of times having sex while using drugs or alcohol. Condom use every time for specific sexual behaviors. Study ongoing, no interim results available. Future reports expected to contain measures of frequency and duration of message delivery, participation rate with referral to the prevention specialist, and number of new STIs diagnosed over the project period. Process evaluation reports include numbers of referrals, appointments kept with specialist, etc.

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Table 2. (*Continued*)

Study and Location	Sample Characteristics	Study design and Evaluation Tools	Description of intervention/s	Outcome Variables and Results
Fisher et al. (2006) New Haven, CT Hartford, CT Options/*Opciones* Project	Two urban hospital-based comprehensive HIV clinics with similar population demographics Male = 58% Black = 38% Hispanic = 35% White = 22% HS diploma or less = 80% Heterosexual = 46% IDU = 40% MSM = 12% Intervention arm = 252 Control arm = 245	Quasiexperimental One clinic assigned to intervention arm and one clinic assigned to standard of care arm. Self-reports using standardized sexual and injection drug use behavior assessments. ACASI measure of HIV prevention knowledge, motivation, behavioral skills, and sexual and drug-using behaviors.	**Provider-Delivered** Intervention arm received brief (5-10 minute) discussion previously defined as the Option Project HIV risk reduction intervention. Control arm received standard medical care during routine visits to HIV care provider and HIV risk reduction counseling on an ad hoc basis. Intervention delivered at each visit over 18 months.	Intervention arm effect measured by unprotected vaginal, anal, insertive oral sexual events, and unprotected insertive oral sex. Significantly decreased ($b = .62$, $SE = .24$, $p \leq .01$). Study arm × time effect with identical measures. Significantly decreased ($b = .51$, $SE = .15$ $p < .001$). Standard of care arm effect with identical measures. Significantly increased ($b = .51$, $SE = .28$, $p < .01$).
Kalichman et al. (2005) Healthy Relationships packaged intervention Atlanta, GA	Recruited from AIDS service organizations and HIV/AIDS clinics in Atlanta, GA Male = 233 Female = 99 Self-identified as gay = 52% Heterosexual = 39% Bisexual = 9% HS graduate = 48%	RCT Surveys of demographic and health characteristics, social cognitive theory constructs, and treatment satisfaction	Intervention group received five-session group intervention focusing on disclosure to non-sex partners, disclosure to sex partners, and reduction in transmission risk behaviors. Control group attended time-matched health-maintenance support group considered to be standard of care. Group facilitators were two skilled mental health counselors, one of whom was infected with HIV. Each group was gender- and sexual orientation-specific.	Detailed structured interviews that focused on sexual risk taking and protective behaviors were conducted. Significant reductions in unprotected vaginal and anal intercourse, particularly in relationships with uninfected partners in previous 3 months at 6-month follow-up (OR = .6; 95% CI = .38-.94).

Wolitski et al. (2005) Seropositive Urban Men's Intervention Trial San Francisco New York	San Francisco total participants = 578 Male = 100% Black = 19% Hispanic/Latino = 11.5% White = 58% Gay = 87.2% Bisexual = 11.6% HS graduate or less = 27.4% Some college = 39.8% New York total participants = 590 Male = 100% Black = 36.9% Hispanic/Latino = 22.2% White = 32.9% Gay = 81.3% Bisexual = 15.6% HS graduate or less = 31.5% Some college = 36.4%	RCT Pre- and postintervention ACASI	Standard intervention arm participated in 1.5-2 hour lectures that presented HIV/STI transmission and safer sex practices. Enhanced intervention arm participated in 6 weekly 3-hour sessions that addressed sexual relationships, HIV/STI transmission, drug/alcohol use, assumptions about partner serostatus, and disclosure.	Sex and drug use practices. Disclosure of HIV status with main partner, and unknown serostatus nonmain partners. Intervention failed to achieve significant decrease relative to the standard intervention arm in number of men reporting unprotected insertive anal intercourse with partners of negative or unknown HIV status, the behavior carrying the highest risk of transmission of the virus to others. A significant decline in this behavior was observed in both treatment arms postintervention.
Richardson et al. (2004) 6 HIV clinics in California	Participants randomly recruited from clinic populations Gain-frame = 175 Loss-frame = 214 Control = 196	Quasiexperimental Clinics assigned to one of two experimental arms or to control arm Self-reports	**Provider-Delivered** Gain-framed intervention emphasized positive consequences of practicing safer sex. Loss-framed intervention emphasized negative consequences of unsafe sex. Control intervention focused on medication adherence. Intervention delivered at all routine visits over 10-11 months.	Self-reported unprotected insertive anal, receptive anal, or vaginal intercourse with any partner within previous 3 months. Participants further subdivided into those having sex with only one partner (lower risk) and those with two or more partners (higher risk). Gain-framed message (OR = 3.69; 95% CI .41-1.52, p = .47) nonsignificant. Loss-framed message (OR = .51, 95%, CI = .27-.96, p = .04) significant/

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Table 2. (*Continued*)

Study and Location	Sample Characteristics	Study design and Evaluation Tools	Description of intervention/s	Outcome Variables and Results
Wingood et al. (2004) Atlanta, GA Birmingham, AL	Women 18-50 years old (*mean* = 34.7 years) Black = 84.2% HS graduate = 63.7% 1 or > children = 83.3% living with HIV *N* = 366 WILLOW = 190 Comparison group = 176	RCT Self-report	Two arms, both facilitated by trained female health educator and trained HIV-infected peer educator. Each arm received four 4-hour interactive group sessions. Experimental arm received sexual risk reduction and social network intervention. Control arm received a health promotion intervention.	Self-reported unprotected vaginal intercourse significantly lower in WILLOW group at both 6-month (1.3 vs. 1.8; $p = .037$) and 12-month assessment (1.6 vs. 2.9; $p = .029$)/ At 12 months, WILLOW group reported significantly lower mean number of perceived partner barriers to using condoms ($p = .004$), fewer beliefs that condoms interfere with sex ($p = .01$), higher condom use self-efficacy ($p = .001$), more knowledge about HIV risk behaviors ($p = .0001$), greater skill in using condoms ($p = .0001$), and more social network members ($p = .02$).
Margolin et al. (2003) New Haven, CT	HIV infected IDUs = 90 Convenience sample recruited as participants entered a methadone program	RCT Self-report	Intervention arm received enhanced methadone maintenance program with six additional sessions relating to HIV risk reduction. Components included motivation for behavior change, video demonstration of needle cleaning and correct condom use followed by practice of both, harm reduction role playing, and skills practice.	High-risk behavior, illicit drug use, and medication adherence. No significant difference in percentage engaged in unprotected sex in previous 3 months at 3-month follow-up (OR = .33; 95% CI = .08-1.40). No significant difference in percentage engaged in needle-sharing in previous 3 months at 3-month follow-up (OR = 1.59; 95% CI = .32-7.77).

Patterson et al. (2003) San Diego, CA	$N = 387$ Male = 91% Gay/bisexual = 85%	RCT Self-report	Intervention Group 1 received single (90-minute) counseling session focused on problem identified by participant (condom use, safer sex negotiation, or disclosure). Group 2 received single session covering all three problem areas. Group 3 same as Group 2 with 2 additional monthly booster sessions. Group 4 received diet/exercise counseling.	Self-reported unprotected oral, vaginal, or anal intercourse with all uninfected partners or partners with unknown HIV status within the previous 4 months. Significant group across time effect for comprehensive counseling with booster sessions group. Significant decrease in unprotected sex acts across all groups over time.

NOTE: ACASI = audio computer-assisted self-interview, ART = antiretroviral therapy, CI = confidence interval, HR = Healthy Relationships, HS = high school, IDU = intravenous drug user, JHU = Johns Hopkins University, KHARMA = Keeping Healthy and Active with Risk reduction and Medication Adherence, MEMS = medication event monitoring system, MI= motivational interviewing, MSM = Men who have sex with men, MSW = master of social work, OR = odds ratio, RCT = randomized controlled trial, SPLASH = Supporting Positive Living and Sexual Health, STEPS = Striving to Engage People, STI = sexually transmitted infection, UAB = University of Alabama, Birmingham, WILLOW = Women Involved in Life Learning From Other Women.

prevention counseling reported by patients from the clinics with written procedures was 68.6%. The clinics that offered provider-initiated counseling reported a counseling frequency of 56.0%, and those clinics with no written or informal procedures reported only 45.3%. The increased frequency of counseling in those clinics with written procedures was significantly higher when compared with those with no procedures in place (odds ratio [OR] = 3.17; 95% confidence interval [CI]: 1.24-8.06; $p < .02$), suggesting that development of written procedures might be a helpful strategy for HIV clinics.

Multivariate analysis suggested that in clinics with provider-initiated counseling, the individuals most likely to receive prevention counseling were those reporting recent sexual activity, those not on ART, and those who were Black. In the clinics with no procedures, Blacks were significantly less likely to receive prevention counseling, whereas female patients and those reporting recent sexual activity were associated with more counseling.

A secondary analysis of these survey and interview data compared other factors that may affect the frequency of prevention counseling (Morin et al., 2004). The size of the clinics in terms of total number of patients was reported to be a significant predictor of counseling frequency. Patients in medium-sized clinics (300-1,000 patients) were significantly more likely (OR = 1.74; CI: 1.04-2.33; $p < .05$) to receive HIV prevention counseling than those receiving care in large clinics (>1,000 patients). Other significant predictors of the patients reporting prevention services included patients in care at the clinic for less than 1 year (OR = 2.35; 95% CI: 1.60-3.44; $p < .001$); those patients who were sexually active (OR = 1.75; 95% CI: 1.24-2.49; $p < .005$); and those patients expressing worry about transmitting HIV to someone else (OR = 2.04; 95% CI: 1.21-3.42; $p < .01$).

Morin et al. (2004) also provided insights into barriers to HIV prevention counseling using a qualitative content analysis. Barriers were identified as lack of time, specialized training, dedicated funding for staffing, and understanding of individual roles and responsibilities in the process. The idea of a conflict between the roles of advocate for patient health and guardian of public health was identified in several provider interviews. This dichotomy was also seen

in the content of the prevention messages that varied between moralistic messages about good behaviors that could protect the patient from additional health problems and more confrontational messages about the risks of infecting others. Patient interview data reinforced the importance of patient-provider rapport when considering the patient's willingness to discuss sexual behaviors.

Metsch et al. (2004) published the results of a survey of physicians who treated HIV-infected patients in HIV care clinics in Atlanta, Baltimore, Los Angeles, and Miami. Survey items were clustered around provider attitudes toward treating PLWH, provider perceptions of barriers to HIV care, and provider perceptions of the occurrence of mental health problems and drug abuse in their patients. The majority of reporting physicians had been caring for HIV-infected patients for more than 8 years. The data showed that physicians were more likely to deliver HIV risk reduction counseling to newly diagnosed patients (60%) than established patients (14%). Among physicians caring for newly diagnosed patients, those who agreed they had sufficient time to spend with patients and those who were very familiar with current treatment guidelines were more likely to provide risk reduction counseling. Physicians with fewer HIV-infected patients (1-18 patients per month) were almost three times as likely and physicians with a median number of HIV-infected patients (19-100 patients per month) were almost two times as likely as physicians with high HIV-infected patient loads (>100 patients per month) to provide counseling to their newly diagnosed patients.

Intervention Studies

Although a discussion of the theoretical underpinning for each intervention trial is not the focus of this review, it is important to note that all of the study groups that included a discussion of theory used a theory grounded in behavior change that is fundamental to the premise that HIV transmission is a behavioral phenomenon. The theories and counseling methods used in each trial are summarized in Table 1. Bandura's social cognitive theory (1986, 1994) was used to inform the intervention development in six projects; Prochaska and DiClemente's transtheoretical/stages of change model (1982) was used in six projects; Fisher and Fisher's information-motivation-behavior model (1992) was used in four projects, and harm reduction theory (Spring, 1991) was used in two studies. Several of the studies used multiple complementary theories. It is interesting that only one of these studies applied a theoretical foundation that specifically focused on a subpopulation of PLWH. Wingood et al. (2004) based the WILLOW project (Women Involved in Life Learning from Other Women) interventions on the theory of gender and power (Wingood & DiClemente, 2002). This theory addresses how societal expectations of women's roles as caregivers can impact healthy coping and social networking activities.

Three counseling techniques were used to deliver the interventions. These were motivational interviewing ($n = 7$), cognitive-behavioral counseling ($n = 3$), and message framing ($n = 2$). Motivational interviewing is a brief counseling method that addresses behavior change in a nonjudgmental, client-centered, but directive style (Miller & Rollnick, 2002). The method has been particularly effective in substance abuse counseling and is proving to be an effective tool to support lifestyle modifications such as diet, exercise, and smoking cessation (cited in Gerbert et al., 2006). Cognitive-behavioral therapy uses self-regulation, self-motivation, and problem solving strategies in its approach to behavior change (Dobson, 2003). Message framing is based on internalization and individual perception of the meaning of the message to the receiver of the message (Rothman & Salovey, 1997). Messages can be delivered either through a benefit/positive frame or a consequence/negative frame.

A total of 17 intervention studies are included in this report. Table 2 contains information on the sample characteristics, study design, evaluation methodology, interventions, outcome variables, and results, if available. It should be emphasized that six of the trials have no interim results and have only reported on design, program, and evaluation issues. The studies that have reported preliminary data are continuing, with more complete results to follow over the next few years.

One perspective from which to compare these trials is to focus on the delivery of the prevention intervention. The interventions were delivered in single or multiple sessions and were delivered by the care provider and/or other clinic staff. Both of

these factors impacted the feasibility and cost of the prevention programs. Eleven studies evaluated interventions delivered by professionals other than the patient's medical provider and were frequently delivered outside of the clinic setting. The six remaining studies evaluated interventions that were delivered within the context of a scheduled clinic appointment and included the patient's medical provider in the delivery of the intervention.

The majority of the studies included in this review are randomized controlled trials (n = 11). Fisher et al. (2006) and Richardson et al. (2004) used quasiexperimental designs; Zuniga et al. (2007) and Gardner et al. (2008) used pre- and postnonexperimental designs; and Rutledge (2007) presented a qualitative clinical case report with two cases. Kalichman et al. (2007) presented outcome data from a follow-up study that evaluated a variation to the Healthy Relationships Intervention Project previously reported (Kalichman, Rompa, & Cage, 2005).

The length of the interventions across all trials varied from multiple sessions with individuals or groups to interventions that were described as brief, individual single sessions. Patterson, Shaw, and Semple (2003) reported significant reductions in risk behaviors with an individual, time-intensive, multisession counseling intervention. Multiple, time-intensive, individual sessions were designed and are being evaluated by Nollen, Drainoni, and Sharp (2007) and Golin et al. (2007). Multiple session group interventions were used by the Healthy Living Project Team (2007), Wolitski, Gomez, and Parsons (2005), Wingood et al. (2004), Kalichman et al. (2005, 2007), Margolin, Avants, Warburton, Hawkins, and Shi (2003), and Holstad, DiIorio, and Magowe (2006). Brief (<10 minute) individual interventions have been reported to significantly reduce risk behaviors (Fisher et al., 2006; Gardner et al., 2008; Richardson et al., 2004). Other brief (<10 minute) individual interventions are being evaluated by Callahan, Flynn, Kuenneth, and Enders (2007), Grimley, Bachmann, Jenckes, and Erbelding (2007), and Zuniga et al. (2007).

The trials that evaluated interventions delivered by professionals other than the patient's medical provider included interventions delivered by social workers (Golin et al., 2007; Nollen et al., 2007), registered nurses (Holstad et al., 2006), health educators and an HIV-infected peer educator (Wingood et al., 2004), substance abuse counselors (Margolin et al., 2003), mental health counselors combined with either HIV-infected facilitators (Kalichman et al., 2005) or uninfected facilitators (Kalichman et al., 2007), and facilitators trained in cognitive-behavioral therapy techniques (Healthy Living Project Team, 2007). The Healthy Living Project Team (2007), Wolitski et al. (2005), Wingood et al. (2004), Kalichman (2005, 2007), and Margolin et al. (2003) have reported results (summarized in Table 2). Each of the reported intervention trials except Margolin et al. cited a significant reduction in self-reported transmission risk behaviors.

For the purpose of this discussion, a second group of intervention trials is identified by the patients' health care providers involved in some aspect of the delivery of the intervention. These trials include those described by Callahan et al. (2007), Fisher et al. (2006), Gardner et al. (2008), Grimley et al. (2007), Richardson et al. (2004), and Zuniga et al. (2007). Interim results have been reported from three of these trials. Fisher et al. (2006) reported significant reductions in unprotected sexual events using a brief (5-10 minute) provider-delivered intervention based on motivational interviewing. Richardson et al. (2004) reported a significant decrease in unprotected intercourse using a loss-framed message (e.g., "If you don't use clean syringes, you could get hepatitis") and no difference using a gain-framed message (e.g., "If you use condoms you will protect your sex partners") when both groups were compared with a control group that received medication adherence counseling. Gardner et al. (2008) reported a significant decrease in unprotected sex at 3 months following a provider-delivered counseling session using the Positive STEPS (Striving to Engage People) program developed by the Mountain Plains AIDS Education and Training Center (2008).

The remaining three studies were designed to compare variations of provider-delivered and provider-enhanced interventions. Callahan et al. (2007) evaluated the effects of a provider-delivered intervention compared with an enhanced intervention that used the health care provider intervention followed by an HIV prevention specialist intervention. In a similar study, Zuniga et al. (2007) compared a consequence-framed prevention message to the same

message followed by four sessions with an HIV prevention specialist. Grimley et al. (2007) evaluated a brief provider-delivered intervention individually tailored to a patient's risk, which was determined using an audio computer-assisted self-interviewing assessment. One study group received counseling on single or multiple risks at each session, and a second group received counseling based on a single priority risk behavior that was determined through the audio computer-assisted self-interviewing assessment and rated to be in the most advanced stage of change. These studies are all ongoing, with no interim results published to date.

Discussion

A total of 17 trials were discussed in this review, and 11 have reported preliminary outcome data. There is abundant evidence that interventions delivered to either groups or individuals in a variety of formats can effectively reduce HIV transmission risk behaviors. Assessments of relative efficacy to determine superiority of methods are not yet available. However, it is clear that a brief intervention delivered within the context of a routine medical visit by any member of the health care team is less expensive compared with interventions that are lengthy and include multiple sessions. Within the context of the current financial climate, it is imperative to select cost-effective interventions that are also effective. As more results become available, a retrospective cost analysis would be very useful.

In the spirit of moving forward, most of the publications included a discussion of lessons learned that can be used in the development of new programs. Several lessons were repeatedly mentioned, including (a) obtaining buy-in from clinic providers before beginning the program, (b) addressing provider attitudes and beliefs about risk reduction, (c) attempting to identify and overcome any resistance from providers who are uncomfortable with counseling, (d) providing training in the selected counseling technique, (e) anticipating changes to clinic flow with the introduction of the program, and (f) providing a clear outline of staff responsibilities for the project (Myers et al., 2007). These results may be used to inform clinical practice until complete results are available.

The gaps in knowledge related to HIV prevention with HIV-infected individuals are, in part, related to the lag time from program design and implementation to evaluation, analysis, and translation into practice. Groups funded through the 2003 HRSA Prevention with Positives initiative have only recently begun to report results (Malitz & Eldred, 2007). The changing social landscape and demographic patterns in today's patients may affect risk reduction strategies as well as intervention outcomes. Perhaps these groups of patients should be evaluated separately from previous cohorts. The variety of risk behaviors in the emerging subpopulations of PLWH would suggest that a single intervention might not be effective in every case. Further evaluation of interventions with these subpopulations will be important. Finally, interventions specific to patient learning styles as well as patient and provider communication styles would seem essential to the development of successful behavior-change prevention strategies.

Clinical Considerations

- Identification and understanding of internal personal and clinic barriers to prevention with positives counseling can help staff develop a strategy to encourage brief counseling at every clinic visit.
- Identification of staff members who have an interest in prevention counseling to function in either a counseling role or as a leader for project development will help insure success.
- Development of a written prevention with positives plan to delineate each staff member's responsibilities and/or a process for referral for prevention counseling has been shown to improve quality and frequency of counseling.
- If brief, motivational interviewing strategies are expected from staff, formal training is essential.
- Nurses are known for functioning in multiple roles. Strengths in communication, patient education, health promotion, and patient advocacy can combine to make nurses ideal prevention counselors and prevention project directors in HIV clinic settings.

Conclusions

As the first decade of research on prevention with positives draws to a close, these encouraging preliminary results can provide guidance to immediately inform clinical practice. As more reports from specific intervention trials become available, evidence-based knowledge in the domain of prevention with positives will expand, and interventions will be incorporated into standards of care. Additionally, in this era of cost-containment, providers will be encouraged toward 100% participation in prevention counseling during medical visits. There is no doubt that the research domain of prevention with positives continues to deserve the priority status assigned by the NIH, the Institute of Medicine, the CDC, and numerous HIV professional organizations including the Association of Nurses in AIDS Care.

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