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Interventions to Promote Linkage to and Utilization of HIV Medical Care among HIV-diagnosed Persons: A Qualitative Systematic Review, 1996–2011

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Abstract

This qualitative systematic review examined interventions that promote linkage to or utilization of HIV care among HIV-diagnosed persons in the United States. We conducted automated searches of electronic databases (i.e., MEDLINE, EMBASE, PsycINFO, CINAHL) and manual searches of journals, reference lists, and listservs. Fourteen studies from 19 published reports between 1996 and 2011 met our inclusion criteria. We developed a three-tier approach, based on strength of study design, to evaluate 6 findings on linkage to care and 18 findings on HIV care utilization. Our review identified similar strategies for the two outcomes, including active coordinator's role in helping with linking to or utilizing HIV care; offering information and education about HIV care; providing motivational or strengths-based counseling; accompanying clients to medical appointments and helping with appointment coordination. The interventions focused almost exclusively on individual-level factors. More research is recommended to examine interventions that address system and structural barriers.

Keywords

HIV care utilization; linkage to care; retention in care; HIV/AIDS; people living with HIV; qualitative systematic review

Introduction

Since its introduction in 1995, highly active antiretroviral therapy (HAART) has allowed many people diagnosed with HIV to lead healthy and productive lives. To maximize the benefits of HAART, it is important that HIV-diagnosed persons be linked to and retained in HIV primary medical care [1–4]. Earlier entry into and better utilization of HIV care have been shown to reduce risk of developing HIV opportunistic infections [5]; increase survival rates [2, 6]; improve access to psychosocial and preventive services which promotes

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continuity of medical care [7]; and improve overall quality of life [8]. Additionally, evidence from San Francisco [9] and British Columbia [10] indicates that the expansion of HAART coverage is associated with decreases in community viral load and reductions in new HIV diagnoses in those communities. The most direct evidence of early initiation of antiretroviral therapy (ART) for preventing HIV transmission is from the randomized controlled trial of the HPTN Study 052 that showed an impressive 96% reduction in HIV transmission risk in HIV-serodiscordant heterosexual couples [11].

Despite the individual- and population-level benefits of HIV care and treatment, a considerable number of people diagnosed with HIV in the United States are not receiving HIV medical care. A recent meta-analytic review estimated that 69% of HIV-diagnosed persons entered primary medical care soon after diagnosis and that 59% of HIV-diagnosed persons had two or more HIV medical visits in a 12-month interval [12]. The estimated percentage of HIV-infected persons in the United States who were diagnosed with HIV, then linked and retained in HIV care, received treatment, and have successfully achieved viral suppression ranges from only 19% to 29% [13–15]. Hence, there is considerable room for improvement in all phases of the continuum of HIV care.

Several barriers may prevent HIV-diagnosed persons from entering into HIV care. These include avoidance and disbelief of HIV serostatus, and negative experiences with, and distrust of, health care [16], not feeling sick [17], and having concerns about privacy [18]. A separate set of barriers may prevent persons with HIV from utilizing HIV medical care, including unstable housing [19, 20], lack of child care or transportation [21], discomfort in engaging with medical providers [22–24], HIV stigma [25], negative perceptions of the health care system [26, 27], misperception that health insurance coverage is necessary [28, 29], limited social support [30], competing caregiver responsibilities [31], and competing unmet needs such as mental health or drug addiction [32]. With the National HIV/AIDS Strategy (NHAS) calling for increasing access to HIV care and improvement of health outcomes for persons with HIV [4], it is important to identify effective prevention strategies that eliminate barriers and facilitate HIV-diagnosed persons' entry into and utilization of HIV medical care.

The purpose of this systematic review is to locate and qualitatively evaluate interventions designed to promote linkage to and ongoing utilization of HIV care among HIV-diagnosed persons in the United States. A recent publication [33] by an International Association of Physicians in AIDS Care Panel (IAPAC) has systematically searched the literature for entry to care, retention in care, and ART adherence and provided mostly recommendations on medication adherence from the available evidence from the literature. Differing from the general IAPAC guidelines, our review provides a more in-depth evaluation of each intervention and its effect on linkage to care or HIV care utilization outcome and includes more recently published evidence. Our specific goals are threefold: determine the types and strengths of the interventions tested, demonstrate specific strategies that promote linkage and utilization of HIV care, and determine what research gaps and programmatic recommendations can be obtained from the studies reviewed.

Methods

Database and Search Strategy

We used the Center for Disease Control and Prevention (CDC)'s HIV/AIDS Prevention Research Synthesis (PRS) (http://www.cdc.gov/hiv/topics/research/prs) project's cumulative HIV/AIDS/STI prevention database [34]). Two librarians with substantial systematic search experience developed a comprehensive search strategy that included automated and manual searches. The automated search was conducted in October, 2011 and updated in May, 2012 to identify reports published between January, 1996 and December, 2011. The automated search was implemented in MEDLINE, EMBASE, CINAHL, and PsycINFO [35–38] by cross-referencing multiple search terms (i.e., index terms, keywords, and proximity terms) in three areas: HIV-positive persons; prevention/intervention/evaluation; and health care utilization descriptors (e.g., care access and utilization, linkage, retention). No language restriction was applied to the automated search. As required by the PRISMA checklist [39], the full search strategy of the MEDLINE database is provided in the appendix. The searches of the other databases are available from the corresponding author. The manual search consisted of checking reference lists of pertinent articles and examining HIV/AIDS Internet listservs (i.e., adherence@ghdonline.org; www.RobertMalow.org) and other government-funded projects and programs listed on the Health Resources and Services Administration (HRSA) Special Projects of National Significance (SPNS) website (http://hab.hrsa.gov/abouthab/special/spnsproducts.html).

Study Selection

Studies were included if they met all of the following criteria: (1) conducted in the United States after HAART became available in 1995; (2) main goal or one of the study goals was to promote linkage to HIV care or HIV medical care utilization among HIV-diagnosed persons; (3) studies that provided statistical tests of intervention effects or only provided descriptive data without providing statistical tests of intervention effects; and (4) linkage to care or HIV care utilization outcomes (defined below) were reported.

For this review, we broadly defined linked to HIV care as entry into care among persons newly or previously diagnosed with HIV infection who had either never entered care, or had entered care but dropped out as defined in the original study. HIV care utilization is broadly defined to capture a range of outcomes depending on the focus and intent of the original study. For some studies, HIV care utilization outcomes reflect retention (e.g., two HIV care visits in a 6-month period, an HIV care visit every 3 or 4 months) among persons who were already linked to HIV care. Other studies did not specifically indicate whether study participants were already linked to HIV care at the time of assessment. For those studies, the HIV care utilization outcomes reflect the proportion of participants who had a care visit at the time of assessment regardless of their previous care history.

Studies were excluded if the outcome focused on utilization of case management rather than HIV primary care [40–42]; emergency or inpatient hospitalization [43]; or general health care utilization and not HIV-specific care [44–47]. We did not include HIV testing programs

in communities or in clinic settings because the studies often did not include sufficient information describing linkage strategies [48–50].

Data Abstraction

Once the eligible studies were identified, standard qualitative research methods were used to collect pertinent data [51]. Two studies (HRSA SPNS Outreach initiative and HRSA SPNS Outreach, Care, and Prevention to Engage HIV Seropositive Young MSM of Color) [52, 53] produced multiple published reports (Table 1). One publication reported the findings of two separate interventions [21]. In addition, some publications provided both linkage to care and HIV care utilization outcomes. We coded the findings separately for each outcome. We also treated the finding (either a linkage to care or HIV care utilization outcome) in each published report independently because the finding often focused on different populations (e.g., newly diagnosed or not fully engaged in care), examined different intervention strategies, used part of the pooled data from multi-sites or individual site data, or evaluated the intervention effect with different study methods.

For each published report, we coded study characteristics (e.g., study location and dates, study design, sample size, data collection method, research design), participant characteristics (e.g., target population, gender, race/ethnicity, sexual orientation, income, housing status, drug use, mental health diagnosis, health insurance status, HIV disease status), intervention characteristics (e.g., intervention focus, components, delivery method, and duration), and outcome measures.

We also coded a-priori intervention categories that included: accompanying a client to a medical appointment; ancillary services (e.g., child care, nutrition supplementation, food vouchers, clothing, emergency financial assistance, housing, drug treatment, and mental health services); appointment coordination (e.g., scheduling, reminders, follow-up on missed appointments); case management (e.g., active coordinator's role in helping with linking to or utilizing HIV care); co-location of care and services (offering service at the same facility as HIV-diagnosed persons received HIV primary care); culturally-specific strategies and language interpretation; establishing formal links between agencies; home-based services; media; outreach; counseling and psychosocial support strategies (e.g., providing information or education, counseling, building relationships, providing emotional support, assessing client's strengths); and transportation services (e.g., provide shuttle service or subway/bus token). Trained reviewers worked independently to extract the relevant data using a standardized abstraction form. Each relevant published report was coded by 2 reviewers. The overall agreement of independent codes among the reviewers was 96% with a kappa rate of 80%. Discrepancies were resolved through reviewer discussion.

Three-tier Framework Used in Evaluating Intervention Effect

Studies were heterogeneous in sample characteristics, study designs, type of interventions, and outcome measures. A meta-analysis was not performed because calculating pooled effects would not be appropriate due to heterogeneity across studies. Instead, we developed a hierarchical three-tier approach after multiple internal and external consultations with HIV researchers to evaluate evidence with varying study designs. This tier system is based on the

rigors of research design as well as the strength of findings. Tier I evidence refers to a statistically significant intervention effect (i.e., $p < .05$) based on the between-group comparison from a randomized controlled trial (RCT). Tier II evidence refers to a statistically significant effect (i.e., $p < .05$) based on (a) a comparison between the post-intervention outcome data of an intervention group and the outcome data of a historical control group; or (b) a pre- and post-intervention analysis of a serial cross-sectional or longitudinal cohort. Tier III evidence is based on the comparison of post intervention data against Marks et al's meta-analysis findings [12] – that is, exceeding 69% of newly HIV-diagnosed study participants who were linked to care after receiving an intervention (i.e., linkage to care cut-off point) or exceeding 59% of study participants who had at least two primary HIV care visits within a specified time period (i.e., retention in care cut-off point). Findings that were not reported as described above could not be evaluated using our tiered framework.

Results

Study Characteristics

A total of 9,522 abstracts were screened, with 166 full published reports obtained and reviewed for further examination. Nineteen published reports [21, 52, 54–70] met the eligibility criteria and these comprised of 14 different intervention studies.

Table 1 displays the study, participant, and design characteristics of the published reports. Five focused on persons newly diagnosed [52, 57, 58, 60, 63], one on solely or partially out-of-treatment HIV-diagnosed persons [62], and four of those who were in intermittent HIV care [52, 55, 61, 67]. Three were specifically designed to bridge HIV care for ex-offenders after they were released to communities [66, 68, 70]. The remaining published reports did not clearly indicate whether participants had previously entered HIV primary care or not [21, 54, 56, 64, 65, 69]. Across published reports, racial and ethnic minority participants ranged from 62% to 100% and gay or bisexual participants ranged from 12% to 100%. One published report specifically targeted homeless HIV-diagnosed persons [69] while 13 others indicated that 10% to 80% of participants did not own or rent property, or lived in unstable housing situations. A majority of HIV-diagnosed participants reported income levels of $10,000 or less per year (range: 62%–100%). The percentage of study participants with health insurance ranged from 34% to 96%.

In terms of study design, five [60, 64, 65, 68, 69] of the 14 studies were RCTs. About half of the studies evaluated outcomes with small sample sizes (i.e., < 100 participants in the intervention arm) and all were based on convenience samples. Interventions varied substantially in the term of intensity: some only offered case management contacts up to five times in 90 days [58, 60], while others offered multiple-component interventions and on-going case management over a 12-month intervention period [21]. Common post-baseline measurement time points ranged from 3, 6, 9, to 12 months. The outcome assessments were usually based on medical records or self-report.

Findings on Linkage to Care Outcomes

As seen in Table 2, six findings reported on linkage-to-care outcomes and five of the six findings can be evaluated with our three-tier framework. These five findings focused on newly diagnosed persons and clustered around two major projects: ARTAS (original and ARTAS-II) and the HRSA-SPNS related studies. All five findings showed evidence of improving the percentage of newly diagnosed persons entering into HIV care after the intervention. Among these findings, the strongest evidence came from one RCT [60] that used a time-limited strength-based case management strategy for linking newly diagnosed persons to care. Intervention participants were significantly more likely than control participants to visit a HIV clinician within six months of enrolling in the intervention. The remaining four findings [52, 57, 58, 63] were evaluated with the Tier III criterion. The percentage of newly diagnosed persons who were entered into HIV care within 3 or 6 months of study entry ranged from 78% to 92%, all of which exceeded the Tier III criterion (i.e., > 69%).

Although there were a variety of intervention components for all five findings that showed linkage to care improvements, two most common components that were consistently found throughout all five findings were case management that helped clients to navigate complex medical care systems and counseling and psychosocial support strategies that included building relationships, identifying client strengths, counseling, and providing information and education. Accompanying clients to appointments [57, 58, 60] and coordinating appointments for clients [52, 57] were also strategies used in some interventions.

The one finding that could not be evaluated with one of the three tiers was focused on out-of-care HIV-diagnosed persons [62]. Before the intervention, time without medical care for the study participants averaged 535.4 days (17.8 months). Fifteen months after the study entry, 29% of this hard-to-reach group entered into HIV medical care. This particular finding used similar strategies that were used by the other five significant findings, such as appointment accompaniment and case management.

Findings on HIV Care Utilization Outcomes

As seen in Table 3, 18 findings reported HIV care utilization outcomes and 11 of 18 can be evaluated by the three-tier framework. Eight of the 11 findings (73%) showed evidence of improving HIV care utilization among HIV-diagnosed persons. Among the eight findings that showed significant improvement, the strongest evidence came from one RCT [60] that focused on promoting initial entry into care, but also reported a retention-in-care outcome. Persons who received the strength-based intervention were significantly more likely to have HIV care visits in each of the two consecutive 6-month periods. For the remaining findings that demonstrated evidence, three indicated Tier II evidence [55, 59, 61] and four demonstrated Tier III evidence [52, 57, 63, 67].

As with the linkage to care findings, there were various interventions for all eight findings that showed health care utilization improvements. The intervention components found in almost all eight findings is case management that helped clients to navigate complex medical care systems and counseling and psychosocial support strategies. The most commonly used

counseling and psychosocial support strategies were providing information or education [57, 59, 61, 63, 67] and identifying and addressing clients' strengths [52, 55, 60]. The next most common intervention components were accompanying clients to medical appointments [55, 57, 59, 60] and helping with appointment coordination [52, 61].

The findings from three RCTs did not show any between-group differences on HIV care utilization outcomes. One RCT [68] tested an intensive case management model for ex-incarcerated persons. Two other RCTs [65, 69] that had HIV care utilization as one of multiple intervention goals (e.g., risk reduction, medication adherence, securing housing). Of the two RCTs, one provided limited case management services and ancillary services (i.e., immediate rental assistance) [69] while the other only trained participants on how to be a peer mentor [65]. None of the other intervention strategies were reported in these three non-significant findings.

There were two main differences between the interventions with significant evidence of HIV care utilization improvement and those without. The interventions with significant findings provided multiple strategies and also were specifically focused on improving linkage to care or HIV care utilization, while the interventions without significant evidence provided one or two intervention components and tended to have multiple intervention goals (such as risk reduction and medication adherence).

Among the seven findings that could not be evaluated with one of the three tiers, one was an RCT [64] that tested the differential intervention effect delivered by peer versus professionals for reducing gaps in care among newly diagnosed persons. The remaining six findings [21, 54, 56, 66, 70] reported the percentage of participants who had only one care visit at the post-intervention assessment and could not be evaluated with Marks et al's retention in care finding (i.e., Tier III criterion). The intervention strategies found in these findings were similar to those findings that could be evaluated: case management, counseling and psychosocial support strategies, and appointment accompaniment. Four findings also used transportation as an intervention strategy.

Discussion

There is evidence from several studies conducted in the United States that interventions can improve linkage to HIV care and HIV care utilization outcomes. Interventions that focus specifically on linking or retaining patients in HIV care generally produce more favorable outcomes than interventions that are broad-based and try to address multiple prevention goals such as risk reduction and medication adherence (e.g., INSPIRE [65] and Housing and Health Study [69]). Our findings also suggest that a variety of interventions can be effective in producing positive outcomes: enhancing patients' strengths through strengths-based counseling and helping navigate complex medical care systems may be especially beneficial in engaging and retaining HIV-diagnosed persons in HIV care. Also, reducing or removing barriers to accessing HIV care such as providing information and education about HIV care, accompanying clients to medical appointments and helping out with appointment coordination appear to be effective.

A few limitations of the literature and this review warrant comment. The evidence presented in this review is primarily based on well executed RCT and several non-RCT studies. Additionally, there is great diversity among the studies in target populations, study designs, intervention components, analysis approaches, and outcome measurements. The heterogeneity, coupled with a small number of rigorously designed studies (i.e., RCT) available in the current literature, makes comparisons across studies challenging and makes it impossible to unravel the independent effects or interactions among various intervention characteristics. Evidence shown in this review should be considered as promising and be further evaluated when more studies, especially controlled studies, become available.

While RCTs are often considered a gold standard for evidence, there are several challenges and barriers for conducting RCTs to evaluate linkage to care and HIV care utilization outcomes. Settings such as outreach centers may make it difficult to conduct randomization due to potential group contamination as well as ethical issues. In addition, not all studies have intervention-specific end-points, as health care utilization services provided by the sites may already exist, making it more challenging to conduct rigorous outcome evaluation. These challenges call for systematic outcome monitoring over time and study designs that are rigorous but feasible in real-world settings [33, 71].

The studies we reviewed focused on interventions at the individual level and not at the wider interpersonal, environmental or structural level. Less is known about strategies that can improve the provider-patient and family-patient relationships or address structural- or system-level barriers (e.g., flexible clinic hours, integrated appointment tracking systems, funding for HIV care). Access to HIV care involves a multi-dimensional process that includes individual, interpersonal and structural factors. The findings from this review mainly explored one piece of the puzzle: the individual-level interventions. More examination of the synergic effects of multi-dimensional interventions is needed to provide a more complete picture of best practices for linking and retaining HIV-diagnosed persons in care [72].

Although a large proportion of HIV-diagnosed persons in the studies we reviewed were part of hard-to-reach populations, several research gaps remain in terms of which interventions may work best for specific populations. The majority of studies were conducted in urban areas. Access to care in rural areas needs to be emphasized in future research, as barriers to service utilization are different between rural and urban areas [72]. In addition, barriers to care for newly diagnosed persons may be different from those who were diagnosed in the past but never linked to care or entered HIV primary care but dropped out. Our definition of “linkage to care” is broader than linking newly diagnosed HIV-infected persons to care as we also included linking previously diagnosed HIV-infected persons who never entered in care or persons who previously entered HIV primary care but have dropped out. More research is needed to closely examine intervention strategies or identify additional strategies that may work better with specific targeted populations.

Many studies included in this review did not clearly describe the care history of study participants, making it difficult to evaluate the intervention effect for specific target groups based on participants’ care history. Improving the reporting of participant characteristics

(e.g., percentage of people who are newly or previously diagnosed) and care history (e.g., never in care, intermittent care) and using standardized measures of linkage and retention across studies will further facilitate our understanding of the processes of "being in care."

In summary, more research is needed to examine the added effect of multi-dimensional interventions that not only address individual factors but also system and structural factors that are associated with barriers to linkage to care and HIV care utilization. Standardized measures should be established and transparent reporting of these measures should be considered in future studies to facilitate evaluating the effectiveness of the interventions. In conclusion, we identified several emerging individual-level intervention strategies for improving linkage to care and HIV care utilization. Incorporating these strategies when developing interventions may enhance the consistency and quality of health care for and the overall health of persons living with HIV.

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Appendix: Automated Search

Strategy Database: MEDLINE

Search Interface: OVID

Interface Key

$ = truncation	
ab = abstract	ti = title
Subheadings	
/co = complications	/dt = drug therapy
/di = diagnosis sh	/nu = nursing
/pc = prevention and control	/px = psychology
/th = therapy	/tm = transmission

HIV/HIV Positive Person MeSH and Keywords

1 HIV infections/co, dt, di, nu, pc, px, th, tm

2 HIV infect$.ti,ab

3 (HIV adj4 diagnos$).ti,ab

4 HIV positiv$.ti,ab

5 (HIV adj4 care).ti,ab

6 (HIV adj4 treatment$).ti,ab

7 living with HIV.ti,ab

8 or/1–7

Linking and Retention in Care MeSH and Keywords

9 (access$ adj4 care).ti,ab

10 (access$ adj4 barrier$).ti,ab

11 (access$ adj4 (treatment or service$)).ti,ab

12 (barrier$ adj4 care).ti,ab

13 case management.ti,ab

14 case manager$.ti,ab

15 (decreas$ adj4 barrier$).ti,ab

16 (engag$ adj4 (care or service$)).ti,ab

17 (enroll$ adj4 care).ti,ab

18	((enter$ or entry) adj4 care).ti,ab
19	((enter$ or entry) adj4 service$).ti,ab
20	(improv$ adj4 access$).ti,ab
21	(improv$ adj4 retention).ti,ab
22	((kept or keep$ or return$) adj4 appointment$).ti,ab
23	(link$ adj4 (retain$ or retent$)).ti,ab
24	(link$ adj4 care).ti,ab
25	(link$ adj4 case).ti,ab
26	(link$ adj4 treatment).ti,ab
27	(link$ adj4 service$).ti,ab
28	(outreach adj4 (care or link$ or program$)).ti,ab
29	((provision or provid$) adj4 (care or service$)).ti,ab
30	(reduc$ adj4 barrier$).ti,ab
31	((re engag$ or reengag$) adj4 (care or treatment or service$)).ti,ab
32	((re enter$ or reenter$) adj4 (care or treatment or service$)).ti,ab
33	((refer or refers or referred or referral$) adj4 (care or medical or treatment or clinic or service$)).ti,ab
34	((retain$ or retent$) adj4 care).ti,ab
35	(seek$ adj4 (care or treatment$)).ti,ab
36	(utiliz$ adj4 (treatment or care or service$)).ti,ab
37	(medical adj4 (care or treatment or service$)).ti,ab
38	(gap$ adj2 care).ti,ab
39	(visit adj2 (constan$ or consist$)).ti,ab
40	(appointment$ adj2 adher$).ti,ab
41	((follow-up or follow up) adj2 discontin$).ti,ab
42	((miss$ or schedul$) adj2 (visit$ or appointment$)).ti,ab
43	($contin$ adj2 care).ti,ab
44	or/9–43
45	8 and 44
46	Year limits (1996 +), Publication Type Limits: Clinical Trial, Controlled Clinical Trial, Corrected and Republished Article, Evaluation Studies, Journal Article, Meta-Analysis, Multicenter Study, Published Erratum, Randomized Controlled

Trial, Retraction of Publication, Review, Review Literature, Technical Report, Validation Studies

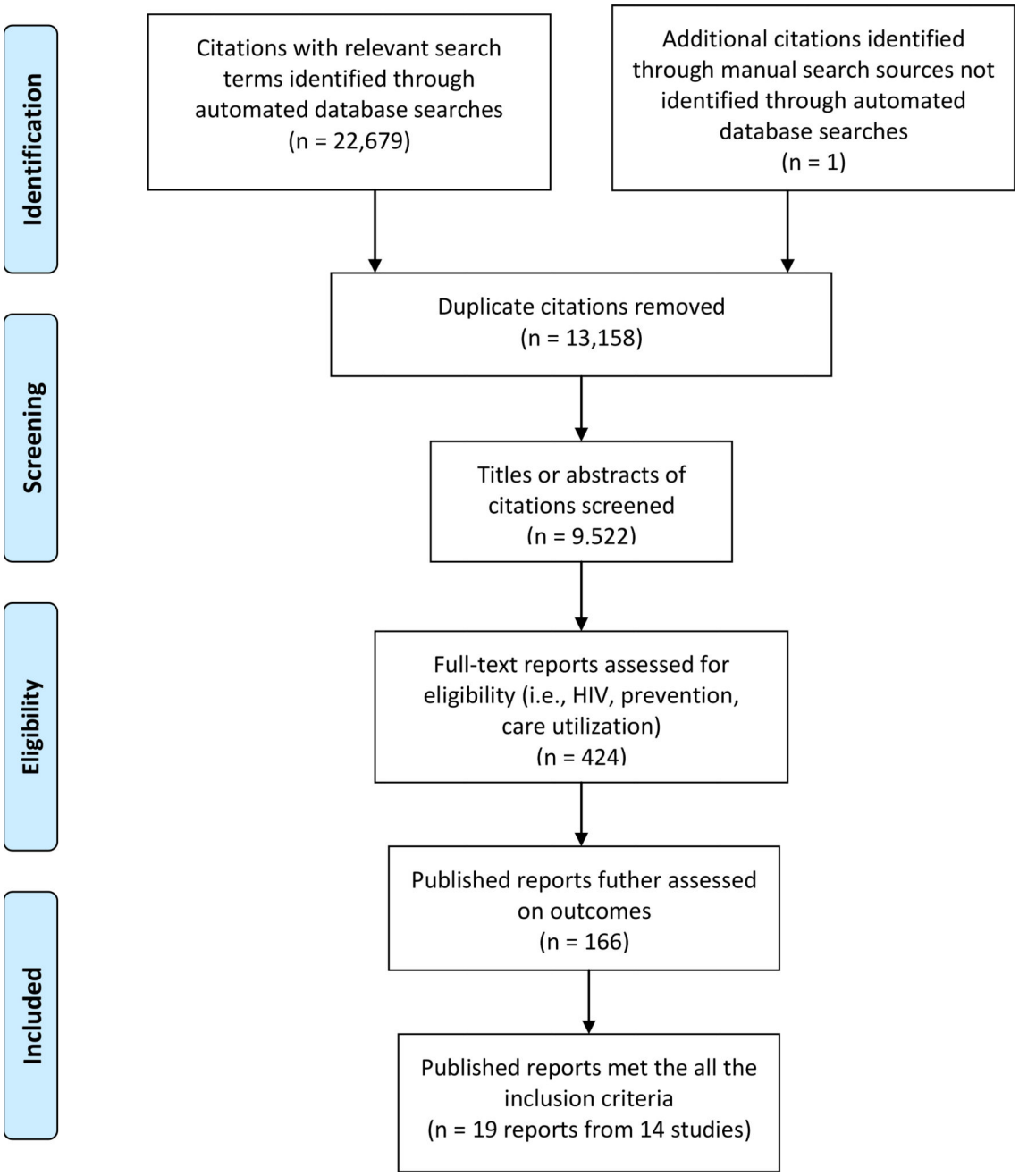

Figure 1.
Study selection process

AIDS Behav. Author manuscript; available in PMC 2018 April 19.

Table 1

Study, Participant, and Design Characteristics (14 Intervention Studies from 19 Published Reports)

Study Name	First Author (Publication Year), Study Dates, and Location of Study	Target Population, Percent Female, Persons of Color (POC) or Gay/Bisexual (GB)	Income or Housing Status, % Drug User, % Mental Health Diagnosis	HIV Disease Status, Health Insurance	Type of Design, Data Collection Method	Intervention Period, Assessments, Analytic Sample
ARTAS	Gardner (2005) [60], 3/01–5/02, Atlanta, GA; Baltimore, MD; Miami, FL; Los Angeles, CA	Newly diagnosed 28.9% female 93% POC NR GB	73.3% Income ≤ $10,000 16.8% used crack cocaine and 10.2% used IDU in past 30 days NR for Mental Health	77.7% diagnosed with HIV in past 6 months; Mean Log10 viral load: 4.52 (Interv) vs. 4.53 (Control) 85% public insurance	2-group, randomized Medical records confirming self-report data	Intervention lasted 3 months Assessed at 6 and 12 months post baseline N=273 (n=136 intervention vs. n=137 control)
ARTAS II	Craw (2008) [58], 4/05–10/06, Anniston, AL; Atlanta, GA; Baltimore, MD; Baton Rouge, LA; Chicago, IL; Columbia/ Greenville, SC; Jacksonville, FL; Kansas City, MO; Miami, FL; Richmond, VA	Newly diagnosed 27.3% female 81.6% POC 46.4% GB	61.7% Income ≤ $10,000; 10.9% Unstable housing 6.3% IDU and 14.2% non-IDU in past 3 months 59.6% above CES-D cutoff score for depression (mean score ≥ 16)	NR for HIV Disease Status 35% any insurance	1-group, post data Self-report, medical records, and case manager summary reports	Intervention lasted 3 months Assessed at 6 months N=626
Bilingual/Bicultural Health Care Team	Enriquez (2008) [59], 3/05–3/07 Kansas City, MI	Hispanics 21% female 100% POC NR GB	NR for all 3 variables	88% met criteria for ARV treatment (CD4 t cell count below 300 cells/mm^3 or HIV viral load >	1-group, pre & post Electronic medical records	Intervention lasted 12 months Assessed at 12 months N=86

Study Name	First Author (Publication Year), Study Dates, and Location of Study	Target Population, Percent Female, Persons of Color (POC) or Gay/Bisexual (GB)	Income or Housing Status, % Drug User, % Mental Health Diagnosis	HIV Disease Status, Health Insurance	Type of Design, Data Collection Method	Intervention Period, Assessments, Analytic Sample
				100,000 copies/ml NR for Health Insurance		
Bridge Project for APIs	Chin (2006) [56], 6/97-3/01, New York City, NY	In or out of HIV primary care 15% female 100% POC 43% GB	NR for all 3 variables	NR for HIV Disease Status 41% ADAP Plus; 27% Medicaid/ Medicare; 23% Private	1-group, post data Self-report data	Intervention lasted 6 months Assessed at 16.9 months N=32
Bridge Project for HIV-diagnosed ex-offenders	Rich (2001) [66], 1/97 – 6/00, Providence, RI	Ex-offenders 28% female 66% POC 12% GB	69% homeless or doubled-upped with a friend or relative 80% IDU 49% self-reported mental illness diagnosis (48% depression, 25% anxiety, 17% PTSD, 10% schizophrenia)	NR for HIV Disease Status 63% no insurance, 33% Medicaid, 1% private	1-group, post data Medical records	Intervention lasted 18 months Assessed at 12 and 24 months N=97
Bridge Project for HIV-diagnosed ex-offenders II	Zaller (2008) [70], 5/03 – 12/05, Providence, RI	Ex-offenders 29% female 62% POC 19% GB	All had annual income <$10,000; mean income = $199; 86% unstable housing	NR for HIV Disease Status 42% Medicaid; 7%	1-group, post data Medical records	Intervention lasted 18 months Assessed at 12 and 24 months N=59

Study Name	First Author (Publication Year), Study Dates, and Location of Study	Target Population, Percent Female, Persons of Color (POC) or Gay/Bisexual (GB)	Income or Housing Status, % Drug User, % Mental Health Diagnosis	HIV Disease Status, Health Insurance	Type of Design, Data Collection Method	Intervention Period, Assessments, Analytic Sample
			97% reported a history of substance use or binge drinking 72% scored below the general US population on the mental health scale	Medicare; 2% private		
BRIGHT	Wohl (2011) [68], Study dates NR, North Carolina	Ex-offenders 27% female 89% POC NR GB	NR for Income/ Housing 65% use of cocaine in past 30 days prior to incarceration 61% diagnosed with depression; 16% diagnosed with anxiety	median CD4 count = 338 cells/mm3 NR	2-group, randomized Self-report or community medical records	Intervention lasted ~6.5 months for intervention arm and 3–6 months for control arm Assessed at 4, 8, 12, 16, 20, 24 weeks N=89 (n=43 intervention vs. n=46 control)
California Bridge Project	Molitor (2006) [62], 3/01–12/03, California - 21 sites	Without a prior history of HIV medical services 24.6% female 74.1% POC 48.6% GB	NR for Income/ Housing 16% IDU NR for Mental Health	NR for both variables	1-group, post data Matching client ID number with reports from bridge worker	Intervention lasted 35 months NR for Assessment Time N=322

Study Name	First Author (Publication Year), Study Dates, and Location of Study	Target Population, Percent Female, Persons of Color (POC) or Gay/Bisexual (GB)	Income or Housing Status, % Drug User, % Mental Health Diagnosis	HIV Disease Status, Health Insurance	Type of Design, Data Collection Method	Intervention Period, Assessments, Analytic Sample
HRSA-SPNS Outreach Initiative	Andersen (2007) [21], study dates NR, Detroit, MI Two Interventions: **1.** Transportation Only and **2.** Tansportation plus	Female drug users 100% female 91.2% POC NR GB	$594/month = Mean income; 13.1% Living arrangements other than owning/ renting home or living with someone else 0% heroin users in past 30 days All without mental health problems	NR for HIV Disease Status 93.4% any; 82.0% on Medicaid	1-group, post data Self-report data	Intervention lasted 12 months Assessed at 6 and 12 months **(1)** Transportation Only intervention: N=61 **(2)** Transportation plus intervention: N=51
HRSA-SPNS Outreach Initiative	Bradford (2007) [55], 10/03-6/06, Portland, OR; Seattle, WA; Boston, MA; Washington, DC	Not fully engaged in HIV care 23% female 67% POC NR GB	63% Living arrangements other than owning/ renting home NR for Drug Use NR for Mental Health	35% with Undetectable viral load 79% any health insurance	1-group, post data Self-report data	Intervention lasted 12 months Assessed at 6 and 12 months N=437
HRSA-SPNS Outreach Initiative	Coleman (2009) [57], 10/03 - 6/05, Seattle, WA; Portland OR; Los Angeles, CA; Detroit, MI; Washington DC; New York City, NY; Providence, RI; Boston, MA; Miami, FL (data from 1 above site not used because no newly diagnosed HIV+ persons)	Newly diagnosed 20% female 85% POC 61% GB	$366 = Mean monthly income; 30% own home/ apt. 43% someone's else's home, 27% temporary arrangement 24% illicit substance use in past 30 days SF-12 Quality of Life on Mental Health	Mean viral load = 21,900; 12% having an undetectable viral load; 47% had CD4 <350 cells/mm3 NR for Health Insurance	1-group, post data Medical records	Intervention lasted 12 months Assessed at 6 and 12 months N=105 at 6 months; N=94 at 12 months

Study Name	First Author (Publication Year), Study Dates, and Location of Study	Target Population, Percent Female, Persons of Color (POC) or Gay/Bisexual (GB)	Income or Housing Status, % Drug User, % Mental Health Diagnosis	HIV Disease Status, Health Insurance	Type of Design, Data Collection Method	Intervention Period, Assessments, Analytic Sample
			Mean Score = 41.5, SD=13 (General population mean score =50)			
HRSA-SPNS Outreach Initiative	Naar-King (2007) [63], study dates NR, Portland, OR; Detroit, MI; Washington, DC; Los Angeles, CA	Newly diagnosed 15.4% female 85.6% POC 63% GB	Mean income: $346; 69.2% not own home 53.9% used illicit drugs or binge drinking in past 30 days SF12 Quality of Life on Mental Health Mean Score = 41.39 SD = 13.01 General population mean score = 50	100% diagnosed with HIV in past 6 months; 53.5% had CD4 count >350: 13.5% had undetectable viral load 53.4% any health insurance	1-group, post data Medical records	Intervention lasted 12 months Assessed at 6 and 12 months N=86 at 6 months; N=76 at 12 months
HRSA-SPNS MSM of Color	Hightow-Weidman (2011) [52], 6/06 – 8/09, Bronx, NY; Chapel Hill, NC; Chicago, IL; Detroit, MI; Houston, TX; Los Angeles, CA; Oakland, CA; Rochester, NY	Young newly diagnosed or not currently in care AA or Hispanic MSM 0% female 100% POC 100% GB	NR for Income/ Housing NR for Drug Use 50% had CES-D ≥ 16 (≥ 16 is cutoff score for depression)	33% had CD5 ≥ 500 65% had insurance	1-group, post data Medical records	Intervention lasted 24 months Assessed at 6 and 12 months N=221
HRSA-SPNS MSM of Color	Hightow-Weidman (2011) [61], 6/06–9/09, North Carolina	Young newly diagnosed or not currently in care AA or	NR for Income/ Housing 56% alcohol abuse	Mean $\log_{10}$viral load: 4.4 for newly diagnosed	2-group comparison with a historical control Medical records	Intervention lasted 24 months Assessed at 24 months

Study Name	First Author (Publication Year), Study Dates, and Location of Study	Target Population, Percent Female, Persons of Color (POC) or Gay/Bisexual (GB)	Income or Housing Status, % Drug User, % Mental Health Diagnosis	HIV Disease Status, Health Insurance	Type of Design, Data Collection Method	Intervention Period, Assessments, Analytic Sample
		Hispanic MSM 0% female 100% POC 100% GB	CESD mean = 15.4 for newly diagnosed; 20.4 for reengaged (≥ 16 is cutoff score for depression)	and 3.7 for reengaged 54% had health insurance; 60% for newly diagnosed; 45% for reengaged		N=111 (n=81 intervention vs. n=30 historical control)
HRSA-SPNS MSM of Color	Wohl (2011) [67], 4/06 – 4/09, Los Angeles, CA	Young newly diagnosed or not currently in care AA or Hispanic MSM 0% female 100% POC 100% GB	2% homeless/ shelter;12% own; 29% with friends; 57% with family 52% had history of drug use 66% above CES-D cutoff score for depression (≥16)	Mean CD4 = 397 NR for Health Insurance	1-group, post data Medical records	Intervention lasted 24 months Assessed at 6 months N=61
Housing and Health Study	Wolitski (2010) [69], 7/04-1/07, Baltimore, MD; Chicago, IL; Los Angeles, CA	Persons in unstable housing condition 30% female 78% POC 33% GB	100% homeless or service risk of homeless NR for Drug Use Mean CES-D = 13.6 (≥ 16 is cutoff score for depression)	39% with AIDS diagnosis NR for Health Insurance	2-group, randomized Self-report data	Intervention lasted 18 months Assessed at 6, 12, and 18 months N=630 (n=315 in each arm)
INSPIRE	Purcell (2007) [65], 8/01-3/05, New York, NY; San Francisco, CA; Miami, FL; Baltimore, MD	Injection drug users 36% female	Income < $10,000 = 83%; Currently	NR for both variables	2-group, randomized Self-report data	Intervention lasted 5 weeks Assessed at 6 and 12 months

Study Name	First Author (Publication Year), Study Dates, and Location of Study	Target Population, Percent Female, Persons of Color (POC) or Gay/Bisexual (GB)	Income or Housing Status, % Drug User, % Mental Health Diagnosis	HIV Disease Status, Health Insurance	Type of Design, Data Collection Method	Intervention Period, Assessments, Analytic Sample
		90.9% POC 32% GB	homeless = 10.4% 100% injected drugs in the past year NR for Mental Health			N=795 (n=396 intervention vs. n=399 control)
LIGHT	Andersen (1999) [54], 10/97-6/98, Detroit, MI	Women needing HIV-related medical services 100% female 99% POC NR GB	24% homeless 90% crack users; 51% with history of drug injection 76% above CES-D cutoff score for depression (≥16)	NR for both variables	1-group, pre & post Self-report data	Intervention lasted 6 months Assessed at 6 months N=81
Youth-Focused Motivational Interviewing (MI)	Naar-King (2009) [64], 03–06, Detroit, MI	Enrolled in medical care 40% female 99% POC 2% transgender NR GB	Mean income: $778 NR for Drug Use NR for Mental Health	NR for both variables	2-group, randomized Medical records	Intervention lasted 6 months Assessed at 12 months pre-baseline and 12 months post-baseline N=87 (n=39 peer-delivered MI, n= 44 professional-delivered MI)

NR = not reported; ARTAS = Antiretroviral Treatment Access Study; BRIGHT = Bridges to Good Health and Treatment; HRSA SPNS Outreach = HRSA SPNS Outreach Initiative; HRSA SPNS MSM of Color = HRSA SPNS Outreach, Care, and Prevention to Engage HIV Seropositive Young MSM of Color; INSPIRE = Interventions for Seropositive Injectors—Research and Evaluation

Table 2

Summary of Intervention Strategies and Findings on Linkage to Care Outcomes (6 Findings)

Study Name	First Author (Year)	Intervention Strategies	Findings	Significance and Evidence?
ARTAS	Gardner (2005) [60]	• Identify and address client needs[d] • Encourage contact with an HIV medical care provider[g] • Accompany to medical and other appointments[a] • Build a relationship with the client[g] • Identify internal strengths and develop resources[g]	Measure: % newly diagnosed participants visited HIV clinician at least once in past 6 months Between-group Comparison: 78% vs. 60% (intervention vs. control); adjusted Relative Risk = 1.36, p =. 0005	Yes; Tier I
ARTAS II	Craw (2008) [58]	• Identify and address client needs[d] • Encourage contact with an HIV medical care provider[g] • Accompany to medical and other appointments[a] • Build a relationship with a client[g] • Identify internal strengths and develop resources[g]	Measure: % newly diagnosed participants received care from a HIV care provider during past 6 months Post-data: 79%	Yes, Tier III
California Bridge Project	Molitor (2006) [62]	• Accompany to medical and other appointments[a] • Referrals to services to services such as support groups, benefits counseling, drug or alcohol treatment, and medical services at an early intervention project[d,e] • Transport clients to agencies[h]	Measure % participants were linked to HIV medical care at 15 months post baseline Post-data: 29%	Indeterminate[i]
HRSA-SPNS MSM of Color	Hightow-Weidman (2011) [52](7 sites)	• Increase youth self-efficacy to enter and remain in culturally and	Measure: % newly diagnosed participants	Yes, Tier III

Study Name	First Author (Year)	Intervention Strategies	Findings	Significance and Evidence?
		developmentally appropriate HIV primary care[g] • Clinic appointment reminders[c] • Case finding for patients who missed appointments (telephone calls, texts, emails, home visits)[c] • Transportation[h]	who were linked to HIV care within 90 days of diagnosis Post-data: 87%	
HRSA-SPNS Outreach	Naar-King (2007) [63]	• Offer support to address stigma[g] • Refer patients to subspecialty care[d] • Offer intensive outreach to offer HIV education and support[f]	Measure: % newly diagnosed participants had a medical appointment in past 6 months Post-Data: 92%	Yes, Tier III
HRSA-SPNS Outreach Initiative	Coleman (2009) [57]	• Face-to-face meetings with the participants to inquire about their well-being and progress in obtaining services and reaching their goals[g] • Appointment coordination[c] • Service coordination[d] • Provide concrete services to meet subsistence needs (food, clothing, housing, transportation, harm reduction supplies)[b,h] • Address health care needs[d] • Accompany client to appointment[a] • Counseling[g] • Provide HIV/risk reduction education[g] • Provide program information[g]	Measure: % newly diagnosed participants had at least one HIV primary care visit at 6 months Post-data: 90% had an visit	Yes, Tier III

Study Name	First Author (Year)	Intervention Strategies	Findings	Significance and Evidence?
		• Health care referrals[d] • Outreach[f]		

ARTAS = Antiretroviral Treatment Access Study
BRIGHT = Bridges to Good Health and Treatment
HRSA SPNS Outreach = HRSA SPNS Outreach Initiative
HRSA SPNS MSM of Color = HRSA SPNS Outreach, Care, and Prevention to Engage HIV Seropositive Young MSM of Color
INSPIRE = Interventions for Seropositive Injectors—Research and Evaluation

Intervention Strategies

[a] = Accompany to appointments

[b] = Ancillary services

[c] = Appointment coordination/reminders/follow-up if appointment missed

[d] = Case management

[e] = Co-location of services

[f] = Outreach

[g] = Counseling and psychosocial support strategies (e.g., counseling, relationship building, providing knowledge, emotional support)

[h] = Transportation

Findings

[i] = post data only and Marks' meta-analysis estimate for linkage cannot apply as study participants were not newly diagnosed patients

Table 3

Summary of Intervention Strategies and Findings on HIV Care Utilization Outcomes (18 Findings)

Study Name	First Author (Year)	Intervention Strategies	Findings	Significance and Evidence?
ARTAS	Gardner (2005) [60]	• Identify and address client needs[a] • Encourage contact with an HIV medical care provider[b] • Accompany to medical and other appointments[c] • Build a relationship with the client[b] • Identify internal strengths and develop resources[b]	Measure: % newly diagnosed participants visited HIV clinician at least twice in a 12-month period Between-group Comparison: 64% vs. 49% (intervention vs. control); Adjusted Relative Risk = 1.41, p =.006	Yes, Tier I
Bilingual/Bicultural Health Care Team	Enriquez (2008) [59]	• Bilingual and bicultural staff[d] • HIV 101 knowledge assessment[b] • Assess barriers to ART adherence[b] • Present Red-Yellow-Green HIV treatment curriculum[b] • Walk client through lab and radiology department registration[c] • Liaison between client and health care providers[a] • Baseline assessment of social and psychological needs[a] • Provide information and referrals to community resources[a,b] • Conduct home-based visits to access care needs and family dynamics[a,e] • Provide HIV and adult primary care health services[f] • Educate about disease progression[b] • Access adherence to treatment[b]	Measure: # of HIV specialty clinic visits Pre intervention: M=2.81(SD=2.34) Post intervention: M=5.30 (SD=2.69) Pre & Post Change: t[42]=6.29, p<0.05	Yes, Tier II
Bridge Project for APIs	Chin (2006) [56]	• Bridge workers conduct outreach[g] • Language interpretation[d]	Measure: Among those who needed primary care services in past 12 months, %	Indeterminate[m]

Study Name	First Author (Year)	Intervention Strategies	Findings	Significance and Evidence?
		• Access to other services such as legal, food pantry, support groups[b,h] • Client escort[c] • Comprehensive case management[a] • Establishing formal links with hospitals and clinics offering HIV care[i] • Provide cultural competency training to HIV primary care institutions[d]	participants actually received such services ^Post-data: 78%	
Bridge Project for HIV-diagnosed ex-offenders	Rich (2001) [66]	• Describe program services[b] • Assess client needs is conducted to formulate discharge plan[a] • Assist with accessing different medical and social service needs[a] • Mental illness triage and referral[a,b] • Substance abuse assessment and treatment[a,b] • Appointments for HIV and other medical conditions[a] • Referrals to housing, nutrition, entitlements, community programs that address basic survival needs[a] • Transportation to medical and social services[j] • Accompany clients to medical andother appointments[c] • Located clients if appointments are missed[k]	Measure: % participants kept the medical appointment post release from prison Post-data: 95% kept their first medical appointment; 98% at 12 months Measure: % participants continued to receive medical care post release from prison Post-data: 82%within 6 months of 18-month program	Indeterminate[n]
Bridge Project for HIV-diagnosed ex-offenders II	Zaller (2008) [70]	• Encourage development of relevant help-seeking skills through modeling, rehearsing, and de-briefing[b] • Advocate and help with accessing resources to address financial and structural barriers[a] • Intensive case management[a]	Measure: % participants received HIV care in past 6 months post release from prison Post-data: 95% at 6 months 96% at 12 months	Indeterminate[n]

Study Name	First Author (Year)	Intervention Strategies	Findings	Significance and Evidence?
		• Motivational interviewing[b] • HIV specialty care in prison[f] • Referrals to mental health, housing, and addiction services[a]		
BRIGHT	Wohl (2011) [68]	• Strengths-based case management[a,b] • Refer to drug treatment[a] • Identify medical and non-medical needs and develop plans to meet needs (housing, employment, medical care, substance use counseling, family reconciliation)[a] • Rapport building[b] • Assessment of client's strengths and post release needs[a,b]	Measure: % participants attended at least 1 routine medical appointment Between-group Comparison: 65% vs. 54% (intervention vs. control, TS=1.07, p=0.3, ns) at 4 weeks; 88% vs. 78% (intervention vs. control, TS=1.62, p= 0.2, ns) at 8 weeks; 91% vs. 89% (intervention vs. control, TS=0.8, p>0.5, ns) at 12 weeks	No, Tier I
INSPIRE	Purcell (2007) [65]	• Train on how to be a peer mentor[b]	Measure: % participants utilized HIV care >2 times in past 6 months Between-group Comparison: Pre-intervention: 71% vs. 69% (intervention vs. control) Post-intervention: 71% vs. 72% (intervention vs. control), Adjusted OR = 0.81, 95%CI = 0.57, 1.14, ns, at 6 months 69% vs. 64% (intervention vs. control); Adjusted OR = 1.14, 95%CI = 0.82, 1.58, ns, at 12 months	No, Tier I
HRSA-SPNS Outreach Initiative	Bradford (2007) [55]	• Identify and address client strengths, needs and barriers to health care[a]	Measure: % participants had 2 or more visits	Yes, Tier II

Study Name	First Author (Year)	Intervention Strategies	Findings	Significance and Evidence?
		develop client skills in provider interactions[b] • Develop service linkages to other organizations[i] • Appointment coordination[k] • Other service coordination[a] • Provide concrete services[h] • Accompany to appointments[c] • Provide HIV information[b] • Health care referrals[a] • Relationship building[b] • Assist clients to make better use of available resources (internal and external)[a,b] • Assist clients to sustain HIV care over time[b] • Assist clients to develop skills to interact with providers[b] • Strengths-based case management[a,b]	during past 6 months Pre & Post Change: 64% vs.87%, p<. 001 at 6 months 64% vs. 79%, p<. 0001at 12 months	
HRSA-SPNS MSM of Color	Hightow-Weidman (2011) [61](NC site)	• Weekly support groups[b] • Social marketing campaign[l] • Intensified outreach[g] • Tightly linked medical & social support network that includes infectious disease doctor who oversaw care[f] • Appointment scheduling[k] • Answer questions[b] • Case management[a]	Measure: % participants attended a clinic visit over the 24-month assessment period Between-group Comparison with an Historic Control: OR = 2.58, 95% CI = 1.34, 4.98	Yes, Tier II
HRSA-SPNS MSM of Color	Hightow-Weidman (2011) [52](7 sites)	• Increase youth self-efficacy to enter and remain in culturally and developmentally appropriate HIV primary care[b] • Clinic appointment reminders[k] • Case finding for patients who missed appointments	Measure: % participants had at least 3 HIV care visits within the first year after enrollment with at least 1 visit in the first 6 months Post-data: 83%	Yes, Tier III

Study Name	First Author (Year)	Intervention Strategies	Findings	Significance and Evidence?
		(telephone calls, texts, emails, home visits)[k] • Transportation[j]		
HRSA-SPNS MSM of Color	Wohl (2011) [67]	• Psychosocial case management[a] • Treatment education/ adherence support[b] • HIV risk reduction counseling[b]	Measure: % participants attended 2 or more HIV care appointments in past 6 months Post-data: 70% for whole sample; 82% for 33 who had been in intermittent care	Yes, Tier III
HRSA-SPNS Outreach Initiative	Coleman (2009) [57]	• Face-to-face meetings with the participants to inquire about their well-being and progress in obtaining services and reaching their goals[b] • Appointment coordination[k] • Service coordination[a] • Provide concrete services to meet subsistence needs (food, clothing, housing, transportation, harm reduction supplies)[h,j] • Address health care needs[a] • Accompany client to appointment[c] • Counseling[b] • Provide HIV/risk reduction education[b] • Provide program information[b] • Health care referrals[a] • Outreach[g]	Measure: % newly diagnosed participants had at least one HIV primary care visit Post-data: 81% had at least 2 visits at 6 months; 70% had an visit between 6 and 12 months post-enrollment	Yes, Tier III
HRSA-SPNS Outreach	Naar-King (2007) [63]	• Offer support to address stigma[b] • Refer patients to subspecialty care[a] • Offer intensive outreach to offer HIV education and support[g]	Measure: % newly diagnosed participants had a medical appointment in both 6-month periods over a 12-month period Post-Data: 81%	Yes, Tier III
HRSA-SPNS Outreach Initiative	Andersen (2007) [21] Intervention 1: Transportation only	• Transportation to medical services[j]	Measure % participants did not miss any medical	Indeterminate[m]

Study Name	First Author (Year)	Intervention Strategies	Findings	Significance and Evidence?
		• Provide referrals[a]	appointment in past 6 months Post-data: 57% during the first 6-month period; 61% during the second 6-month period	
	Intervention 2: Transportation plus	• Transportation to medical services[a] • Home visits[e] • Accompany to medical and other appointments[c] • Identify client's own focal concerns in life and address each concern with a focus on improving sense of well-being[b]	Measure: % participants did not miss any medical appointment in past 6 months Post-data: 51% in the first 6-month period; 58% in the second 6-month period	Indeterminate[m]
Housing and Health Study	Wolitski (2010) [69]	• Help with initiating immediate rental assistance and locating housing[a,h]	Measure: % participants had > 2 medical visits in past 6 months and being on HAART Between-group Comparison: Pre-intervention: 51% vs. 42% (intervention vs. control); Post-intervention: 37% vs. 38% (intervention vs. control, ns) at 6 months 47% vs. 41% (intervention vs. control, ns) at 12 months 49% vs. 46% (intervention vs. control, ns) at 18 months	No, Tier I
LIGHT	Andersen (1999) [54]	• "Hyperlink" clients into health care appointments[k] • Access needed resources[a] • Provide a day treatment program[h] • Provide child care during program and health-related appointments[h] • Accompany women to appointments[c]	Measure: % participants received HIV-related medical services in past 6 months Pre & Post Change: 56% vs. 73%, significant level not reported	Indeterminate[o]

Study Name	First Author (Year)	Intervention Strategies	Findings	Significance and Evidence?
Youth-focused Motivational Interviewing	Naar-King (2009) [64]	• Motivational interviewing[b]	Measure: Gaps in medical appointments. 4 point gap score calculated based on # of gaps over 12 months Comparing 2 intervention arms differing by deliveries: 1.34 vs. 1.52 (peer vs. professional delivered) F=0.54, ns	Indeterminate[p]

ARTAS = Antiretroviral Treatment Access Study
BRIGHT = Bridges to Good Health and Treatment
HRSA SPNS Outreach = HRSA SPNS Outreach Initiative
HRSA SPNS MSM of Color = HRSA SPNS Outreach, Care, and Prevention to Engage HIV Seropositive Young MSM of Color
INSPIRE = Intervention for Seropositive Injectors – Research and Evaluation

Intervention Strategies

[a] = Case Management

[b] = Counseling and psychological support strategies (e.g. counseling, relationship building, providing knowledge, emotional support)

[c] = Accompany to appointments

[d] = Culturally-specific strategies/language interpretation

[e] = Home-based services

[f] = Co-location of services

[g] = Outreach

[h] = Ancillary services

[i] = Establishing formal links between agencies

[j] = Transportation

[k] = Appointment coordination/reminders/follow-up if appointment missed

[l] = Media

Findings

[m] = post data only and Marks' meta-analysis estimate for linkage cannot apply as study participants were not newly diagnosed patients

[n] = post data only and Marks' meta-analysis estimates cannot apply as study participants were ex-offenders

[o] = Pre and post statistic test was not reported and the study cannot be evaluated with any of 3 Tier criteria

[p] = testing whether there was a different effect by deliverer (peer vs. professional) which was not comparing an intervention to a control or standard of care