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## Intensive Case Management Before and After Prison Release is No More Effective Than Comprehensive Pre-Release Discharge Planning in Linking HIV-Infected Prisoners to Care: A Randomized Trial

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### Abstract

Imprisonment provides opportunities for the diagnosis and successful treatment of HIV, however, the benefits of antiretroviral therapy are frequently lost following release due to suboptimal access and utilization of health care and services. In response, some have advocated for development of intensive case-management interventions spanning incarceration and release to support treatment adherence and community re-entry for HIV-infected releasees. We conducted a randomized controlled trial of a motivational Strengths Model bridging case management intervention (BCM) beginning approximately 3 months prior to and continuing 6 months after release versus a standard of care prison-administered discharge planning program (SOC) for HIV-infected state prison inmates. The primary outcome variable was self-reported access to post-release medical care. Of the 104 inmates enrolled, 89 had at least 1 post-release study visit. Of these, 65.1% of BCM and 54.4% of SOC assigned participants attended a routine medical appointment within 4 weeks of release ( $P>0.3$ ). By week 12 post-release, 88.4% of the BCM arm and 78.3% of the SOC arm had attended at least one medical appointment ( $P=0.2$ ), increasing in both arms at week 24–90.7% with BCM and 89.1% with SOC ( $P>0.5$ ). No participant without a routine medical visit by week 24 attended an appointment from weeks 24 to 48. The mean number of clinic visits during the 48 weeks post release was 5.23 (SD = 3.14) for BCM and 4.07 (SD = 3.20) for SOC ( $P>0.5$ ). There were no significant differences between arms in social service utilization and re-incarceration rates were also similar. We found that a case management intervention bridging incarceration and release was no more effective than a less intensive pre-release discharge planning program in supporting health and social service utilization for HIV-infected individuals released from prison.

### Keywords

Prisoners; Access to care; Case management

### Introduction

A substantial proportion of those living with HIV infection in the US have been, are or will be incarcerated. The known prevalence of HIV infection among state and federal prisoners

is at least four times that of the general population and, according to a recent estimate, one of every seven individuals with HIV infection in the US passes through a correctional facility each year [1, 2]. Incarceration offers opportunities to diagnose and then treat those with HIV infection and the available evidence suggests that HIV care during imprisonment leads to health benefits as measured by reductions in viremia, increases in CD4 cell counts and declines in mortality among HIV-infected prisoners that mirror those observed in the non-incarcerated population [3, 4].

Unfortunately, the benefits of HIV care accrued during incarceration are often lost once prisoners are released [5, 6]. Observational studies of HIV-infected individuals following prison discharge have shown that non-adherence to HIV therapy, loss of viral suppression and declines in CD4 cell counts are commonplace—a troubling finding when coupled with data demonstrating a return to HIV transmission risk behaviors among many infected former inmates [5–8].

To explain the loss of HIV control following incarceration, researchers have proposed a lack of access to medical care after release. Under-utilization of medical care by HIV-infected former inmates may be secondary to financial barriers, mental health co-morbidities, geographic considerations or other needs that also deter former prisoners from establishing a medical home after release [9–11].

Since the vast majority of incarcerated HIV-infected persons are eventually released back to their communities of origin, maintaining HIV suppression and immune reconstitution achieved during incarceration is important in terms of both individual and public health. Most prison systems have programs designed to link HIV-infected prisoners to medical care and social services after release. Almost all penal systems have developed pre-release discharge planning procedures to establish referrals for medical and social services for about-to-be-released inmates with chronic illnesses such as HIV infection. A few prisons have also implemented innovative discharge programs spanning the period from incarceration through community re-entry. These institutions report success in enhancing released prisoners' access to health care and substance abuse counseling, and reducing recidivism rates [9, 12]. The efficacy of such intensive release programs, however, in terms of access to HIV care, risk behavior, and recidivism are not known. We are not aware of any randomized controlled trials of aftercare interventions for HIV-infected inmates or former inmates. To date, only one trial of an intervention to improve access to care for HIV-infected persons has been published (The ARTAS Study), and that Centers for Disease Control (CDC)-supported study enrolled only people who were recently diagnosed with HIV infection, not prisoners [13].

We conducted a randomized controlled trial to determine the efficacy of an intensive case management intervention that began prior to, and continued after, prison release to a standard prison pre-release discharge planning program. The objective of the intervention was to facilitate entry into and retention by HIV-centric health care. Another aim of the trial was a reduction in re-incarceration rates. The experimental intervention was based on the Strengths Model, a motivational case management approach that had previously been shown to increase access to care and services for individuals with mental illness, the same model found effective in linking newly diagnosed HIV-infected persons to HIV care in CDC's ARTAS Study.

## Methods

### Site and Participants

The Bridges to Good Health and Treatment (BRIGHT) Trial enrolled HIV-infected inmates 18 years or older in the state's prison system, the North Carolina Department of Correction (NCDOC). All participants were English-speaking, competent to provide informed consent and had no more than 3 months, but no less than 4 weeks, remaining in their sentence. Participants had to be returning to one of 12 study counties in North Carolina (identified previously as those to which the majority of released inmates returned and which included all major metropolitan areas in the state) and be housed at a prison facility that was within an approximately 2 h drive from the release county. All participants were recruited from the Infectious Diseases Clinics at the NCDOC. At the clinic, healthcare staff provided brief information regarding the trial to potential participants and referred interested patients to study personnel. Interested patients then met with a research associate who, as part of the informed consent process, explained the study and answered questions regarding participation. All participants were queried to make certain they understood the study and the study procedures.

### Interventions

Eligible participants were randomized to one of two conditions: a bridging case management (BCM) intervention or standard of care (SOC) pre-release discharge planning.

The BCM intervention was developed using the conceptual Behavioral Model of Health Service Use for Vulnerable Populations to identify mutable factors for intervention [14]. This model was integrated with major features of the Strengths Model of case management [15, 16]. As described elsewhere, the Strengths Model of case management focuses on the identification of the talents, resources, and goals of the client in an open, non-judgmental environment and, unlike traditional case management services, is largely directed by the client rather than the case manager [15, 16]. Prior to recruitment, bridging case managers (BCMrs) underwent a series of group training sessions led by experts in the model as well as structured self-study and continuous clinical supervision aimed at maintaining BCMrs' competency and fidelity to the model. Case managers were based in the major metropolitan areas of the state and were well acquainted with the services available in their home and neighboring counties. They met with study participants regularly prior to and after release to identify medical and non-medical needs and develop plans to meet those needs, including housing, employment, medical care, substance abuse counseling and family reconciliation. Since the Strengths Model calls for the number and intensity of encounters to be driven by the client, the study protocol did not prescribe a formal schedule of meetings for participants with the BCMrs. However, to maintain a degree of standardization, BCMrs were required to attempt to meet with participants at a minimum of every 2 weeks prior to release, twice a week the first week following release, weekly for the following 2 weeks and then at approximately 2 week intervals up to 6 months after release. The initial meetings were dedicated to rapport-building and the collaborative development of an assessment of the client's strengths and post-release needs. Subsequent to these meetings, the participants and BCMrs established short- and long-term goals, and also strategies for achieving these goals, capitalizing on participants' strengths and community resources. Transition to community case management and local services was initiated during the final weeks of the intervention with the aim being to complete the transfer to community services by the end of the sixth month post-release. Each full time BCMr was permitted a maximum case load of 15 clients.

The SOC group received discharge planning from a dedicated HIV outreach nurse employed by the NCDOC who was responsible for developing a discharge plan for HIV-infected

inmates under his or her supervision. There are 11 such nurses in the NCDOC responsible for approximately 350 HIV-infected inmates released each year. Following NCDOC procedures, each nurse worked with inmates approximately 3–6 months prior to their release to make referrals to community clinics and social services, identify sources for coverage of medication expenses and attempt to locate housing. Nurses met with inmates approximately 3 times prior to release. The nurses in the SOC arm did not provide any supportive services or follow-up for inmates following release.

Participants assigned to the BCM group had minimal interaction with the HIV nurses administering the SOC. As designed, the BCM-assigned participants had more frequent pre-release interaction with their case manager than SOC-assigned participants had with their nurse. All inmates, including those in the BCM and SOC groups who were treated with antiretrovirals were provided a 30 day supply of medications on release, per NCDOC policy.

## Evaluations

Demographic data, incarceration history, CD4 cell count, plasma HIV RNA level and medical history were abstracted from participants' NCDOC administrative and medical records. All randomized participants were interviewed at study entry (~3 months prior to release), 2 weeks prior to release, and at weeks 2, 8, 24, 36, and 48 post-release. In addition, at weeks 4, 12, 16, 20, 28, 32 and 40 study personnel made brief telephone interviews to ascertain participants' vital status, medical appointments made, hospitalizations, re-incarcerations and to update contact information. All study interviews were conducted by trained research associates who, to minimize the potential for bias, were blinded to whether participants were assigned to the BCM or SOC condition. Pre-release surveys were conducted face-to-face in private rooms used for routine health screenings and individual counseling sessions. Post-release interviews were arranged to take place at public but uncrowded locations (e.g., libraries, AIDS service organization offices, parks, fast food restaurants) where the interviews could be completed confidentially and safely. Survey questions included standardized and modified scales or items. Access to health care, social service use and unmet needs was surveyed using instruments created by the HIV Cost and Services Utilization Study (HCSUS) [17], substance use was assessed with a survey developed by the Enhancing Prevention with Positives Evaluation Center (EPPEC) [18], depression with the Center for Epidemiological Studies-Depression Scale CES-D [19], and health related quality of life with the SF-12 Health Survey [20]. In order to determine and verify access to care, all participants were asked to provide permission to access their community medical records following release. We used administrative databases for the NCDOC and local jails, as well as self-report, to detect re-incarceration.

All participants received remuneration for completion of post-release study evaluations only (\$50 for the initial 2-week post-release study visit, \$35 for all other post-release visits and \$15 for each brief telephone contact).

## Informed Consent

All participants provided informed consent before enrolling in the BRIGHT study. Consent was obtained in a private area of the clinic by study personnel who were not employees of the NCDOC. Subjects were informed that participation would not impact their health care, the length of their sentence, or their eligibility for parole. The study was approved by the University of North Carolina Biomedical Institutional Review Board, the NCDOC Human Subjects Review Committee, as well as by the US Office of Human Research Programs (OHRP).

## Statistical Considerations

The primary outcome measure was access to medical care. Access to care was determined by self-reported and/or community medical records. At each post release assessment participants were asked whether they had received non-emergent HIV-related or other medical care at a doctor's office or clinic since prison release. Participants with at least one post-release study assessment were included in the primary analysis. Kaplan–Meier survival curves were used to assess whether the time until the first medical care visit was different between the two study arms. Linear regression was conducted to determine whether a difference existed between the study arms in the total number of medical care visits made, after adjusting for various participant characteristics including gender, diagnosis of HIV during the current incarceration, use of antiretrovirals and depression. All statistical analyses were conducted using SAS 9.2 (SAS Institute, Cary, NC).

## Results

### Participants

A total of 104 participants were recruited and randomized. Of these, 89 (43 BCM, 46 SOC) had at least one post-release assessment and were included in the final analysis cohort (Fig. 1). For the 15 participants unable to be followed post-release, the most common reason for exclusion was re-incarceration at the time of or shortly after release (all for pending charges). Other reasons for exclusion included immediate loss to follow-up, inappropriate initial enrollment, withdrawal of consent, or transfer to a prison facility greater than a 2 h drive from the community of release. Post-release follow-up was not conducted for these participants. Demographic characteristics of these 15 and the remaining 89 participants were not found to differ significantly.

The demographic and clinical characteristics of the participants included in the analysis are listed in Table 1. There were no statistically significant differences in the characteristics or pre-release laboratory values between study arms. Reflecting the HIV-infected incarcerated population, most of the participants were male and African-American. Almost three quarters had prior prison incarcerations and over half were depressed (as determined by CES-D or medical record report). The median baseline CD4 cell count was 338 cells/mm<sup>3</sup> (range 19–906) for those randomized to BCM and 376 cells/mm<sup>3</sup> (range 2–1,491) in the SOC arm. At the time of release, almost 70% were receiving antiretrovirals with 83.9% having a plasma HIV RNA level of <400 copies/ml at the last determination prior to release. The diagnosis of HIV infection was made during the current incarceration in 25.8% of participants.

Of the 89 subjects included in the analyses, 31 (72.1%) in the BCM and 28 (60.9%) in the SOC arms completed the week 48 visit. Re-incarceration, as described below, and loss to follow-up were the main reasons for non-completion of the final study visit.

### Access to Medical Care

Access to routine medical care was assessed at weeks 4, 12, 24 and 48 after prison release. Those with missing data at the time of the evaluation were considered to have not received medical care.

In an analysis limited to those with at least one post-release study visit ( $n = 89$ ), at week 4, at which time antiretrovirals provided by the prison at release would be exhausted, 65.1% of those assigned to BCM and 54.4% attended at least 1 routine medical appointment ( $P = 0.3$ ,  $TS = 1.07$ ). At week 12, 88.4% of the BCM arm and 78.3% had accessed medical care at least once ( $P = 0.2$ ,  $TS = 1.62$ ) and at week 24 this increased to 90.7% in BCM arm and 89.1% in SOC arm ( $P > 0.5$ ,  $TS = 0.8$ ). No participant without a routine clinical encounter by

week 24 attended a medical appointment from weeks 24 to 48. The median time to entering into clinical care after release was 4 weeks for those in both study arms ( $P = 0.8$ ) (Fig. 2).

We also conducted an intent-to-treat (ITT) analysis in which all randomized participants were included, including those who were immediately re-incarcerated due to pending charges and therefore not able to access care in the community, as well as the participants who prior to release were removed from the study due to inadvertent enrollment, transfer to non-study prison facility and withdrawal of consent. This added 15 additional participants, nine in the BCM and six in the SOC arms. Follow-up data on access to care was not available for these 15 participants, therefore it was assumed they did not access care after release. The ITT analysis also found no significant differences in access to care between the study arms and produced only a modest change in the proportion accessing care within each group. Specifically, for the BCM and SOC arms, access to care in the ITT analysis was 53.8% vs. 48.1% ( $P = 0.55$ ,  $TS = 0.3538$ ) at week 4, 73.1% vs. 69.2% ( $P = 0.67$ ,  $TS = 0.19$ ) at week 12, and 75.0% vs. 78.8% ( $P = 0.64$ ,  $TS = 0.22$ ) at week 24.

The mean number of clinic visits reported by the analyzed participants with post-release study follow-up ( $n = 89$ ) during the 48 weeks post release was 5.23 ( $SD = 3.14$ ) for BCM and 4.07 ( $SD = 3.20$ ) for SOC ( $P > 0.5$ ,  $TS = 1.74$ ). To verify medical visits, medical records were obtained for a large subset of the sample (51.3% of the BCM group and 63.0% of the SOC group) from community clinics participants attended post-release. Records verified and supported self-reported medical encounters. The mean number of visits based on these records was 4.90 ( $SD = 4.45$ ) for BCM and 4.86 ( $SD = 2.71$ ) for SOC ( $P = P > 0.5$ ,  $TS = 0.8$ ).

After adjusting for time during which a medical visit was possible (exposure time), no significant difference between the access to care for the BRIGHT case managers group and the control group was found ( $P = 0.2$ ,  $TS = 1.25$ ). As expected, exposure time was associated with access to care ( $P < 0.0001$ ,  $TS = 8.91$ ).

Among those in the BCM arm we examined whether there was a dose-response relationship between BCM contact and medical care. There was a relationship between contact hours with the case manager (including the face-to-face visits and telephone calls) and the number of medical visits but this was marginal with each contact hour adding an increase of 0.05 medical visits.

The types of facilities where participants received medical care after release were diverse and included university medical centers, departments of health and private practices. The majority (58%) of these clinics were either at university medical centers or regional hospitals.

Selected participant characteristics were explored for an association with accessing HIV care after release including gender, diagnosis of HIV during the current incarceration, use of HIV medicine and depression. After adjusting for the time during which the participant was not incarcerated, neither gender ( $P = 0.3$ ,  $TS = 1.01$ ), nor diagnosis of HIV during the current incarceration ( $P > 0.5$ ,  $TS = 0.05$ ), nor being on antiretroviral therapy at release ( $P > 0.5$ ,  $TS = 0.26$ ) were associated with the total number of medical care visits. On the other hand, depression was found to be associated with the total number of medical care visits after adjusting for the time during which participants were free ( $P = 0.01$ ,  $TS = 2.63$ ). Specifically, after adjustment, depressed participants, on average, had 1.16 more medical care visits after release than non-depressed participants.

## Hospitalization

During the study, 21 of the 89 (24%) participants were hospitalized at least once: 32.6% of the BCM arm and 15.2% in the SOC arm. In addition, 35 (39.3%) visited an emergency room (ER) or urgent care center (UCC): 39.5% in BCM and 39.1% in SOC. The mean number of ER/UCC visits was 0.837 (SD = 1.25) for those in the BCM arm and 1.07 (SD = 2.64) for those in the SOC arm. There were no significant differences between study arms in rates of hospitalization or ER/UCC use.

## Social Service Use

Participant's self-reported use of social services is detailed in Table 2. With the single exception of assistance with food a greater proportion of participants assigned to BCM reported receiving each of these services. However, the difference in social service use between study arms was not statistically significant for any social service.

## Re-Incarceration

Overall, there were no significant differences in re-incarceration rates between study arms. During the 48 week study follow-up, 30 (33.7%) participants were re-incarcerated either at a jail or a prison: 14 (32.5%) in the BCM arm and 16 (34.8%) in the SOC arm. Ten participants (3 BCM, 7 SOC) were re-incarcerated at a prison and the remainder at local jails.

## Case Manager–Participant Interactions

In the BCM arm, the frequency of interactions between the BCMrs and participants was assessed by a review of BCMr records including notes and telephone logs. The median number of pre-release BCMr-participant visits was 5 (range 1–11) with a median cumulative duration of pre-release sessions of 5.75 h. Post-release, the median number of face-to-face sessions between the BCMr and a participant was 7.5 (range 1–30) with a median cumulative duration of these post-release sessions of 9.9 h. A median of 12 (range 1–44) phone contacts were made between BCMrs and participants adding a median of 4.0 additional cumulative hours to contacts between participants and the BCMrs.

## Discussion

In this randomized controlled trial we found that an intensive case management intervention spanning the periods of incarceration and release of HIV-infected individuals was as effective for released prisoners as a comprehensive pre-release discharge planning program in terms of accessing medical care over the year following release. Further, there were no statistically significant differences of either re-incarceration or social service use between the study groups.

Importantly, we observed high rates of accessing non-urgent medical care in both study arms. At 6 months following release, approximately 90% of participants in each arm had at least one clinical care appointment. However, at 4 weeks following release, at which time those prescribed antiretrovirals would have exhausted their supply of medication provided on release, only two thirds of the BCM participants and half the SOC participants had seen a healthcare provider. This finding is consistent with data from Texas where filling of antiretroviral prescriptions immediately following prison release was found to be extremely low [8]. These observations point to a continued need to develop strategies to engage HIV-infected releasees in care immediately after release.

In addition, despite on-going case management in the BCM arm, social service use reported by participants was not higher among those receiving this intervention. This was surprising

as our hypothesis was that the BCM intervention would address pressing needs that compete for priority with health care. While, a substantial proportion did receive these services, these results may indicate that either BCM insufficiently addressed these needs or that there were limited resources available in the communities to which releasees returned.

We found that accessing HIV care post-release was not influenced by prisoners' gender, first diagnosis of HIV during the current incarceration, or antiretroviral use. However, those with a history of depression had significantly more clinic visits after their release. Although depressed patients may be more motivated to seek medical care, the ARTAS Study found the opposite—a reduced effect of case management on access to care among depressed participants [13, 21].

As well, intensive BCM did not appear to reduce recidivism when prison and jail incarceration were considered together. On the other hand, compared to participants in the SOC arm, fewer of those assigned to BCM were returned to prison (i.e., convicted and sentenced), although more were jailed (i.e., arrested and held). Arrest may not always be a result of individual behavior and can be influenced by local police policies and practices. Whether the differences in prison and jail re-incarceration observed are meaningful remain unclear.

Overall, our findings raise questions about the value of intensive aftercare programs for improving linkage to care and services for HIV-infected releasees. Although such programs exist in several states and positive outcomes have been reported, there has not been rigorous comparative study of the efficacy of such programs. In this trial, an intensive post-release motivational case management intervention did not provide measurable benefits over a pre-release program in which basic discharge planning services, including referrals to medical clinics, completion of medication access forms and investigation of housing options, were provided by prison nurses dedicated to the care of those with HIV and other infectious diseases.

Few studies have examined interventions to improve access to HIV care and services and, to our knowledge, only one, the ARTAS study, was a randomized trial [13]. ARTAS also tested a Strengths Model-based case management intervention versus a more passive standard referral process but, unlike the BRIGHT study, did so among newly diagnosed, non-incarcerated, HIV-infected patients in four US cities. It is noteworthy that in the ARTAS study the case management intervention was found to be more efficacious than standard of care (78% vs. 60% accessing HIV care at 6 months); however, the intervention was found to be less effective in several subgroups, including those with depressive symptoms [13, 21].

The absence of significant differences between post-release outcomes between the intensive case management participants before and after prison release and participants in the standard pre-release discharge planning program for HIV-infected inmates may be due to several factors. Perhaps most important is that although those assigned to the case management intervention accessed care at a high rate, so, too, did control group participants. These rates may indicate that medical care is relatively accessible for HIV-infected former prison inmates in North Carolina. Further, incarceration itself and the HIV care rendered in prison may have led to an enhanced appreciation among inmates for post-release medical care, motivating them to engage in care upon their release regardless of study assignment. Data we collected from participants in this and our preliminary studies of HIV-infected releasees suggest, however, that access to care is perceived by most as a challenge. Qualitative interviews we conducted with a subset of study participants found strikingly consistent responses indicating that (re)establishment of medical care after release was not considered



a priority by former inmates, and was considered secondary to concerns about returning to substance abuse and reconciliation with family [22]. Participation in this trial itself, during which questions were regularly asked regarding access to care, may have served also to motivate participants to seek medical care (i.e., the Hawthorne effect). Lastly, it is also possible that the standard discharge planning being provided to HIV-infected inmates was equally effective as our intensive bridging case management intervention, despite the lack of a post-release component and a high case load among the nurses responsible for pre-release planning. It may be that once a threshold for the subject of post release access to care is reached, aftercare adds little to a well-considered pre-release discharge plan.

Several additional considerations limit the interpretation of our findings. Our sample size precludes detection of small to moderate, but meaningful differences between the two study interventions. The nearly identical rates of access to care and re-incarceration we observed would suggest that a much larger study would likely be necessary to detect what may be relatively modest differences in effect size. Additionally, the study conditions may have influenced the standard of care arm either directly via contamination (e.g., prison nurses adopting techniques used by the BCMrs) or indirectly if the prison nurses, aware their work was serving as a control for an alternative intervention, redoubled their efforts. In addition, access to care was self-reported by participants. Attempts to confirm clinic visits were often difficult due to clinic concerns for patient privacy, despite signed medical information release forms. However, clinical records were collected for over 50% of participants and among this large subset of individuals with available clinic records, no difference in linkage to care between arms was observed and self-report was found to be as accurate as medical records. Lastly, the primary outcome of interest in this study was access of medical care and not the benefits afforded by such care such as post-release medication adherence or viral suppression. Therefore, whether BCM or other aftercare interventions have an effect on these important outcomes remains unknown.

In conclusion, we found high rates of HIV medical care access after prison release among incarcerated HIV-infected individuals. An intensive and motivational case management program spanning incarceration and release was not associated with a greater likelihood of accessing care, receiving major social services or preventing re-incarceration compared to a pre-release discharge planning program without post-release follow-up. While there may be other benefits of continued case management following prison release that were not measured, these findings call into question the value of intensive after care programs for HIV-infected prison releasees.

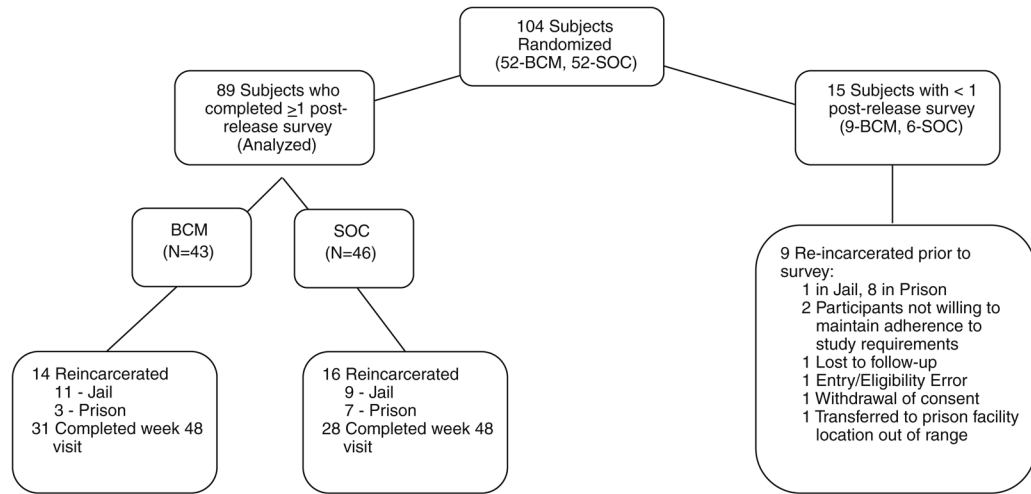
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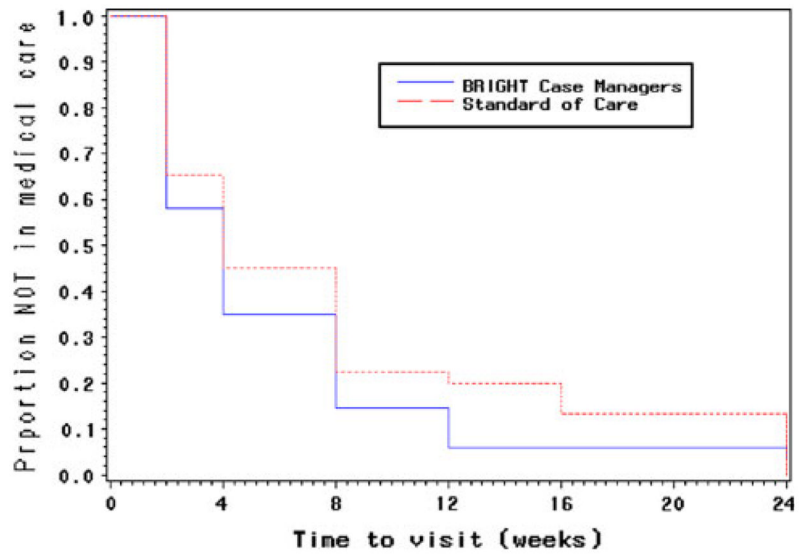
## References

1. Maruschak, LM.; Beavers, R. Bureau of justice statistics: HIV in prisons, 2007–08. U.S. Department of Justice: Bureau of Justice Statistics; 2009 Dec 09. Report No.: NCJ 228307. <http://bjs.ojp.usdoj.gov/content/pub/pdf/hivp08.pdf>

2. Spaulding AC, Seals RM, Page MJ, et al. HIV/AIDS among inmates of and releasees from US correctional facilities, 2006: declining share of epidemic but persistent public health opportunity. *PLoS One*. 2009; 4(11):e7558. [PubMed: 19907649]
3. Wohl, D.; Fleg, A.; Napravnik, S., et al. Virologic response to HAART among incarcerated HIV + individuals [THAB0503]; 17th International AIDS society conference; August 3–8, 2008; Mexico City.
4. Maruschak, LM. HIV in prisons, 2003. Bureau of Justice Statistics Bulletin; 2006. [www.ojp.usdoj.gov/bjs/abstract/hivp04.htm](http://www.ojp.usdoj.gov/bjs/abstract/hivp04.htm)
5. Stephenson BL, Wohl DA, Golin CE, et al. Effect of release from prison and re-incarceration on the viral loads of HIV-infected individuals. *Public Health Rep*. 2005; 120(1):84–8. [PubMed: 15736336]
6. Springer SA, Pesanti E, Hodges J, et al. Effectiveness of anti-retroviral therapy among HIV-infected prisoners: reincarceration and the lack of sustained benefit after release to the community. *Clin Infect Dis*. 2004; 38(12):1754–60. [PubMed: 15227623]
7. Stephenson BL, Wohl DA, McKaig R, et al. Sexual behaviours of HIV-seropositive men and women following release from prison. *Int J STD AIDS*. 2006; 17(2):103–8. [PubMed: 16464271]
8. Baillargeon J, Giordano TP, Rich JD, et al. Accessing antiretroviral therapy following release from prison. *JAMA*. 2009; 301(8):848–57. [PubMed: 19244192]
9. Zaller ND, Holmes L, Dyl AC, et al. Linkage to treatment and supportive services among HIV-positive ex-offenders. *J Health Care Poor Underserved*. 2008; 19:522–31. [PubMed: 18469423]
10. Leukefeld CG, Staton M, Hiller ML, et al. A descriptive profile of health problems, health services utilization, and HIV serostatus among incarcerated male drug abusers. *J Behav Health Serv Res*. 2002; 29(2):167–75. [PubMed: 12032974]
11. Pollack H, Khoshnood K, Altice F. Health care delivery strategies for criminal offenders. *J Health Care Finance*. 1999 Fall;26(1):63–77. [PubMed: 10497752]
12. Molitor F, Kuenneth C, Waltermeyer J, et al. Linking HIV-infected persons of color and injection drug users to HIV medical and other services: the California Bridge Project. *AIDS Patient Care STDs*. 2005; 19(6):406–12. [PubMed: 15989436]
13. Gardner LI, Metsch LR, Anderson-Mahoney P, et al. Efficacy of a brief case management intervention to link recently diagnosed HIV-infected persons to care. *AIDS*. 2005; 19(4):423–31. [PubMed: 15750396]
14. Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? *J Health Soc Behav*. 1995; 36:1–10. [PubMed: 7738325]
15. Rapp RC, Siegal HA, Li L, Saha P. Predicting postprimary treatment services and drug use outcomes: a multivariate analysis. *Am J Drug Alcohol Abuse*. 1998; 24:603–15. [PubMed: 9849771]
16. Rapp CA, Wintersteen R. The strengths model of case management: results from twelve demonstrations. *Psychosoc Rehabil J*. 1989; 13:23–32.
17. The Health Cost and Utilization Study website. Rand Corporation; <http://www.rand.org/health/projects/hcsus/questionnaires.html>
18. University of California, San Francisco. [Accessed 31 March 2010] Enhancing prevention with positives evaluation center. 2008. <http://www.caps.ucsf.edu/tools/surveys/pdf/EPPEC-PatientAssessment.pdf>
19. Radloff LS. The CES-D scale: a self-report depression scale for research in the general population. *Appl Psychol Meas*. 1992; 1:385–401.
20. Ware JE, Kosinski M, Keller SD. A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Med Care*. 1996; 34(3):220–33. [PubMed: 8628042]
21. Gardner LI, Marks G, Craw J, et al. Demographic, psychological, and behavioral modifiers of the Antiretroviral Treatment Access Study (ARTAS) intervention. *AIDS Patient Care STDs*. 2009; 23(9):735–42. [PubMed: 19645619]
22. Haley, D.; Scheyett, A.; Golin, C. perceptions of release among incarcerated hiv-infected persons and implications for practice: the UNC Bridges to Good Health and Treatment (BRIGHT) project qualitative substudy. 16th International AIDS Conference; August 13–18, 2006; Toronto. Abstract THPE0717



**Fig. 1.**  
Participant disposition and outcomes



**Fig. 2.** Kaplan–Meier curves for first medical visit after release for both groups (BCM and SOC) for the BRIGHT study

**Table 1**

Pre-release characteristics of the analysis population by intervention group

	<b>BCM <i>N</i> = 43</b>		<b>SOC <i>N</i> = 46</b>	
	<i>N</i>	%	<i>N</i>	%
Gender				
Male	33	76.7	32	69.6
Female	10	23.3	14	30.4
Race				
White	6	14.0	4	8.7
African American	33	76.7	37	80.4
American Indian or Alaskan native	2	4.7	0	0
Other	2	4.7	4	8.7
Refused	0	0	1	2.2
Education				
8th Grade or less	4	9.3	5	10.9
Some high school	10	23.3	19	41.3
High school graduate	21	48.8	15	32.6
Some college	4	9.3	4	8.7
Completed college	4	9.3	3	6.5
Marital status				
Married	4	9.3	5	10.9
Separated	1	2.3	6	13.0
Divorced	10	23.3	11	23.9
Never married	28	65.1	24	52.2
Mental health diagnoses				
Depression	25	58.1	29	63.0
Anxiety	10	23.3	4	8.7
Psychosis	4	9.3	5	10.9
Substance use				
Use of cocaine in 30 days prior to incarceration	26	60.5	31	67.4
Incarceration history				
Had prior prison incarcerations	32	74.4	34	73.9
HIV history				
Diagnosed with HIV during current incarceration	12	27.9	11	23.9
On antiretroviral therapy at time of release	30	69.7	32	69.6
HIV RNA <400 copies/ml of those on antiretroviral therapy at release	22	73.3	30	93.8

**Table 2**

Self-reported social services during study follow-up use by BRIGHT study arm

	BCM N (%)	SOC N (%)	P-value
Ever received income assistance from social security disability, supplemental security income, emergency assistance from DSS, or emergency assistance from another source			
Yes	14 (32.6)	12 (26.1)	0.50
No	29 (67.4)	34 (73.9)	
Ever received help with health care costs from medicaid or medicare			
Yes	18 (41.9)	15 (32.6)	0.36
No	25 (58.1)	31 (67.4)	
Ever receive help with health care costs from ADAP			
Yes	15 (34.9)	9 (19.6)	0.10
No	28 (65.1)	37 (80.4)	
Ever receive outpatient care for mental health services			
Yes	13 (30.2)	7 (15.2)	0.09
No	30 (69.8)	39 (84.8)	
Ever receive outpatient care for substance abuse services			
Yes	9 (20.9)	7 (15.2)	0.48
No	34 (79.1)	39 (84.8)	
Ever receive any housing assistance (section 8 voucher, public housing, residential program for people with HIV, residential program for substance abuse, or other)			
Yes	12 (27.9)	8 (17.4)	0.24
No	31 (72.1)	38 (82.6)	
Ever receive food stamps or help or help from a food pantry			
Yes	25 (58.1)	31 (67.4)	0.37
No	18 (41.9)	15 (32.6)	