

HIV Care Engagement and Viral Load Suppression in a Comprehensive HIV Care Coordination Program (CCP)

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Updated Abstract

Background: Evidence is needed regarding HIV interventions improving engagement in care (EIC) and viral load suppression (VLS) and reducing demographic disparities in those outcomes. We assessed overall and subgroup-specific EIC and VLS changes following enrollment into a comprehensive medical case management intervention, the NYC Ryan White Part A HIV Care Coordination Program (CCP).

Methods: Using local program data and laboratory records from surveillance, we examined pre- and post-enrollment outcomes for 3,641 clients enrolled before April 2011 and diagnosed >1 year before CCP enrollment, at 28 agencies. For the year before and after enrollment, we estimated EIC (≥2 tests ≥90 days apart, ≥1 in each half-year) and VLS (VL ≤200 copies/mL on latest test in the second half of the year). Relative risks (RRs) and confidence intervals (CIs) for the outcomes were estimated for the sample overall and for subgroups defined by baseline demographic and clinical characteristics, site of enrollment, and duration of enrollment.

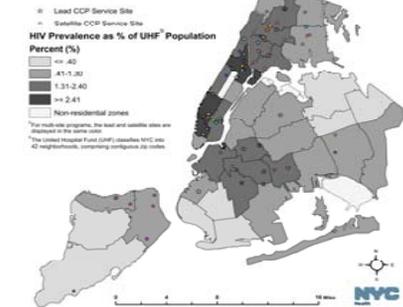
Results: The proportions with EIC and VLS increased from 74% to 91% (RR_{EIC}=1.24, 95% CI: 1.21-1.27) and from 32% to 51% (RR_{VLS}=1.58, 95% CI: 1.50-1.66). Significant improvements held across subgroups. Greater improvements were observed among those enrolled in the CCP throughout the follow-up year and generally among those with clearer risk for suboptimal outcomes at baseline, with the exception of recent drug users, who improved less than non-users. Significant improvements were observed for EIC at 25 (89%) and VLS at 21 (75%) of 28 agencies.

Conclusions: EIC and VLS improvements were robust across most subgroups. Improvements were greater among those with longer enrollment in the CCP, and generally among those with greater barriers at enrollment.

Care Coordination Program Description

- In 2009, with Ryan White (RW) Part A Funding, the CCP was launched at 16 hospital-based and 12 community-based programs (Figure 1).
- A standard CCP protocol guides delivery of medical case management.
- Regular home visits bring the CCP to the clients.
- The CCP aims to promote **health care access and retention**, **treatment adherence** and **viral load suppression** among HIV-positive individuals who demonstrate high risk for suboptimal care outcomes:
 - > newly diagnosed,
 - > previously lost to care/never in care,
 - > irregularly in care,
 - > initiating a new regimen, and/or
 - > exhibiting incomplete medication adherence or response to treatment.
- The CCP model provides
 - > case management
 - > patient navigation including accompaniment
 - > adherence support, including directly observed therapy
 - > health promotion in home visits
 - > assistance with medical/social services

Figure 1. CCP Sites by Neighborhood HIV Prevalence (at end of 2011)



Objectives of Study

1. Compare engagement in care (EIC) and viral load suppression (VLS) in the 12 months before and after CCP enrollment
 2. Examine subgroup differences in outcomes
- * Subgroups defined by baseline characteristics, with the exception of enrollment duration

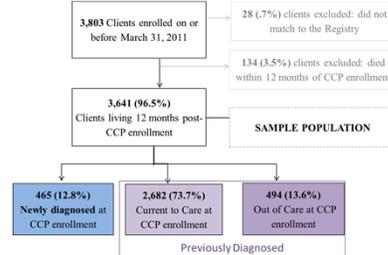
Definitions of Terms

- Baseline Classifications for the Study Sample:**
 - > **Newly Diagnosed:** HIV diagnosis date in 12 months before enrollment
 - > **Previously Diagnosed, Current to Care:** HIV diagnosis >12 months before enrollment, and evidence of care¹ in 6 months prior to enrollment
 - > **Previously Diagnosed, Out of Care:** HIV diagnosis >12 months before enrollment, and no evidence of care¹ in 6 months prior to enrollment
- Outcome Measures:**
 - > **Engagement in Care (EIC):** ≥2 CD4 or VL tests ≥90 days apart, with ≥1 in each half of the (pre- or post- enrollment) 12-month period
 - > **Viral Load Suppression (VLS):** VL ≤200 copies/mL for latest VL test in the second half of the (pre- or post- enrollment) 12-month period²

Study Design and Methodology

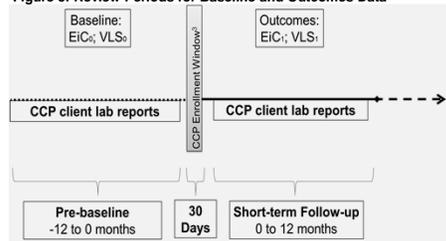
- Eligibility:** CCP clients who were enrolled by March 31, 2011, able to be matched to the Registry, and alive for at least one year of follow-up.

Figure 2: Eligibility Flow Chart



- Hypothesis:** EIC and VLS should improve following CCP exposure.
- Study Design:** Comparison of 12-month outcomes pre- and post-enrollment in the CCP.
- Data Sources:** eSHARE (Ryan White programmatic data) merged with HIV Surveillance Registry (pre-post outcome data), using identifiers common to both sources.
 - > **The Registry** (NYC HIV Surveillance Registry) includes VL and CD4 test dates and results as well as diagnostic events for NYC cases.
 - > **eSHARE** contains required Ryan White provider reporting on client enrollment statuses/dates, demographics, needs, and services.
- Statistical Analysis:** Post- vs. pre-enrollment relative risks (RRs) for EIC and VLS were estimated using GEE, a method for handling correlated data (in this case, because clients served as their own controls).

Figure 3: Review Periods for Baseline and Outcomes Data



Results

Table 1. Baseline Characteristics by Care Status Group within Sample

	Study Sample (%)	Newly Diagnosed (%)	Previously Diagnosed, Out of Care (%)	Previously Diagnosed, In Care (%)
Total	3,641 (100)	465 (100)	494 (100)	2,682 (100)
Male Sex at Birth	2,286 (63)	329 (71)	347 (70)	1,610 (60)
Black or Hispanic Race/Ethnicity	3,329 (92)	403 (87)	457 (93)	2,469 (92)
Median Age in Years (IGR)	45 (34 - 51)	33 (26 - 43)	41 (31 - 48)	46 (38 - 53)
U.S. Country of Birth	2,403 (66)	218 (47)	316 (64)	1,869 (70)
HIV Diagnosis Before 2005	2,422 (67)	0 (0)	314 (64)	2,108 (79)
Median VL ¹ , copies/mL (IGR)	1,660.5 (0 - 35,072)	10,500 (350 - 67,890)	n/a	1,286 (0 - 32,220)
English as Primary Language	2,717 (75)	296 (64)	370 (75)	2,051 (77)
Not Homeless	2,707 (74)	361 (78)	345 (70)	2,001 (75)
Public Insurance	2,643 (73)	256 (55)	301 (61)	2,086 (78)
Current ART Prescription	2,562 (70)	173 (37)	262 (53)	2,127 (79)
Recently Incarcerated ⁴	444 (12)	30 (7)	59 (12)	355 (13)
Recent Drug Use ⁵	595 (16)	52 (11)	63 (13)	480 (18)
Poor Mental Health ⁷	1,047 (29)	144 (31)	132 (27)	771 (29)
High School Graduate	1,898 (52)	284 (61)	284 (58)	1,330 (50)

Figure 4: Length of CCP Enrollment: Post- vs. Pre- Enrollment Change (RR)

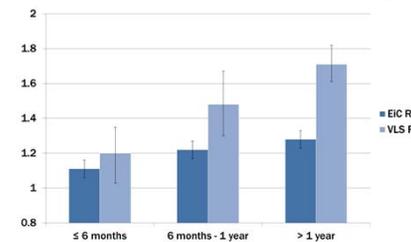
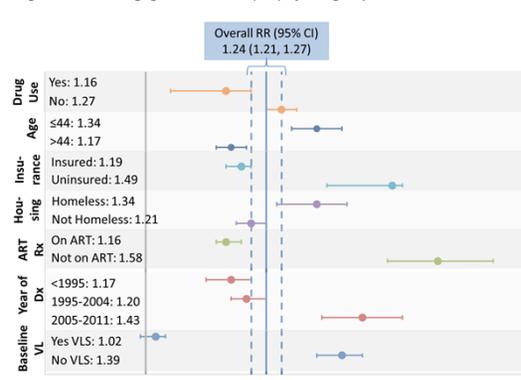


Figure 5: RR of Engagement in Care (EIC) by Subgroup



Notes:

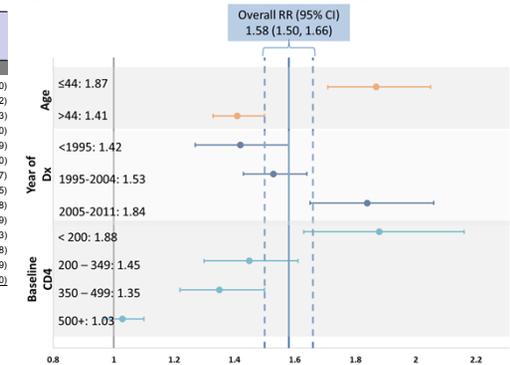
- ¹ HIV laboratory (CD4 and VL) test dates from the Registry are used as proxies for primary care visits.
- ² Missing VL in 2nd half of 12-month period considered equivalent to unsuppressed VL.
- ³ The enrollment process for the CCP involves an initial screening and referral from a CCP-affiliated primary care provider and a formal program agreement process that typically occurs during the 30-day period before the official enrollment date. Due to the common initiation of program contact during this "enrollment window," no laboratory data during this 30-day pre-enrollment period were included in our analyses.
- ⁴ The latest-dated VL laboratory test value before the start of the follow-up (post-baseline) period.
- ⁵ Incarcerated in 12 months prior to CCP enrollment.
- ⁶ Hard drug use (i.e., heroin, crack or cocaine, crystal methamphetamines, or recreational prescription drug use) in the 3 months prior to CCP enrollment.
- ⁷ Indication of lower mental health, based on SF-12v2 mental component summary (MCS) score ≤37.0 at CCP enrollment.

⁸ Length of enrollment during the one-year follow-up period starting with each client's initial date of enrollment.

Prepared by the Bureau of HIV/AIDS Prevention and Control, NYC DOHMH, with data reported to the NYC HIV Registry as of September 30, 2012, covering events through March 31, 2012.

Results Continued

Figure 6: RR of Viral Load Suppression (VLS) by Subgroup



Results Narrative

- EIC and VLS improvements were robust across most subgroups (defined by baseline characteristics, enrollment site, and enrollment duration).
- Generally, those with recognized barriers at enrollment (e.g., low-income, uninsured, unstably housed, and younger populations, and those with lower CD4, unsuppressed viral load, and/or no current prescription for ART at enrollment) showed no significant difference in RRs or showed higher RRs for the desired outcomes. One exception was observed among recent drug users, who had significantly less improvement in EIC than non-users.
- Significant improvements were observed even for those enrolled less than six months, and the relative risks showed an upward trend with increased length of enrollment duration.

Conclusions

- Clients in comprehensive HIV care coordination for persons with evident barriers to care showed substantial and consistent improvement in short-term outcomes, with greater benefit among those enrolled for a full year.
- Significant improvements in both care engagement and HIV viral load suppression were observed even among those with major care/treatment barriers, e.g., mental illness, substance use, and history of incarceration.
- While the general pattern of subgroup differences suggests the potential value of further focusing recruitment on those with greater risk for poor care outcomes, the countervailing finding on recent drug use requires further investigation.

Next Steps

- Compare CCP clients with similar persons with HIV (in usual care) who have laboratory data available during the same periods.
- Examine longer-term outcomes (12-36 months).
- Examine barriers/facilitators for good outcomes in the CCP, using provider-reported, site-level, and client interview data.
- Further explore intervention dose-response effects.
- Assess program cost-effectiveness.

Citation

Irvine, Mary K., et al. "Improvements in HIV care engagement and viral load suppression following enrollment in a comprehensive HIV care coordination program." *Clinical Infectious Diseases* (2014): ciu783.