PATIENT-CENTERED HIV CARE MODEL (PCHCM)

Evidence-Informed for Retention in Care

Evidence-Informed Structural Intervention

INTERVENTION DESCRIPTION

Goals of Intervention

- Improve adherence to antiretroviral therapy (ART)
- Improve HIV viral suppression
- Improve retention in HIV care

Target Population

- Clinic patients

Brief Description

The Patient-Centered HIV Care Model (PCHCM) integrates community-based HIV specialized pharmacists and HIV clinic medical providers to provide patient-centered care for persons with HIV (PWH). PCHCM expands upon the medication therapy management (MTM) model's core components (i.e., medication therapy review, personal medication record, medication-related action plan, intervention and/or referral, and documentation and follow-up) by including information sharing between partnered pharmacy and clinic teams; collaborative medication-related action planning between pharmacists, medical providers, and patients; and quarterly follow-up pharmacy visits. Under PCHCM, clinic staff (e.g., nursing staff) compile patients' medical histories and provide the information to pharmacists. Pharmacists proactively monitor prescription refills to ensure continuous adherence to treatment, provide individualized adherence support, and monitor medical history. Pharmacists assess patients' needs and work directly with their partner clinic to make recommendations and discuss potential action plans and intervention strategies. Pharmacists, patients, and medical providers collaborate to implement the action plans, and pharmacists review the patients' progress at subsequent visits.

Theoretical Basis

- None reported

Intervention Duration

- Ongoing

Intervention Settings

- Community-based HIV specialized retail pharmacy
- Medical clinic

Deliverer

- Community-based HIV specialized pharmacists
- Medical care providers

Delivery Methods
- ART adherence counseling
- Collaborative therapy-related action planning
- Medication therapy management

Structural Components
- Access
  - Increased access and linkage to HIV medical care
- Policy/Procedure—Institutional policy/procedure
  - Revised clinic and pharmacy procedures to accommodate the implementation of the intervention
  - Implemented model to ensure collaboration between community-based HIV specialized pharmacists and medical clinics to provide patient-centered care for PWH
- Physical Structure—Integration of services
  - Integrated services from community-based HIV specialized pharmacists with medical clinic providers to provide patient-centered care for PWH in addition to refilling prescriptions
- Physical Structure—Services provided in a non-traditional setting
  - Implemented model in community-based HIV specialized pharmacies partnered with medical clinics

INTERVENTION PACKAGE INFORMATION

An intervention package is not available at this time. Please contact **Kathy K. Byrd**, Centers for Disease Control and Prevention, Division of HIV/AIDS Prevention, 1600 Clifton Road, NE, Mailstop US8-4, Atlanta, GA 30329.

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EVALUATION STUDY AND RESULTS

Study Location
The original evaluation study was conducted in 10 project sites composed of a medical clinic and one or two community-based retail pharmacies in Albany, GA; Chicago, IL; Fort Lauderdale, FL; Kansas City, MO; Miami, FL; New York, NY; Palm Springs, CA; Philadelphia, PA; St. Louis, MO; and Washington, D. C. between August 2014 and September 2016.

Key Intervention Effects
- Improved retention in HIV care
- Improved HIV viral suppression

Recruitment Settings
- Medical clinics

Eligibility Criteria
Clinic patients were eligible for participation if they were aged ≥18 years at time of enrollment; on or planning to start ART; agreed to clinic visits every six months and to initial and quarterly MTM visits; were willing and able to use the project pharmacies to fill prescription medications; and had one or more of the following:

- an unmet immunological or virological goal
- failed a previous antiretroviral (ARV) regimen(s)
- history of ARV resistance
- on a nonstandard ARV or salvage regimen
- history of medication interruptions
- initiated any new medication
- changed a chronic disease medication
- history of missed appointments
- history of poor adherence
- provider's assessment of being at risk for loss to follow-up
- recent hospitalization or emergency department visit
- two or more chronic medical conditions

Study participants were included in the retention in care analysis if they had a documented HIV diagnosis date that was ≥12 months before the enrollment date. If the diagnosis date was not documented, study participants were included in the analysis if they had a scheduled clinic appointment at the project clinic, HIV viral load or CD4 test, or filled an ARV prescription ≥12 months before the enrollment date. Persons were included in the viral suppression analysis if they had ≥1 viral load result in both the pre- and post-implementation measurement periods; the sustained viral suppression analysis required ≥2 viral load results.

Study Sample

Participants enrolled in the model (n=765) were characterized by the following:

- *43% Black, non-Hispanic; 24% White, non-Hispanic; 13% Hispanic; 10% other/missing; 9% White, ethnicity unknown*
- *73% male; 25% female; 2% transgender*
- *Median age of 48 years*
- *34% Medicaid recipients; 20% Medicare recipients; 15% Ryan White/AIDS Drug Assistance Program (ADAP) recipients; 15% private insurance recipients; 9% uninsured or unknown/missing insurance information; 7% recipients of multiple forms of insurance*

Assignment Method

Not applicable

Comparison

The study used a pre/post research design. Participants were compared pre- and post-model implementation.

Relevant Outcomes Measured

- Retention in care was defined as at least one medical visit with a physician, nurse practitioner, or physician assistant, in each 6-month period of the 12-month measurement period with a minimum of 60 days between medical visits.
    - Pre-implementation retention in care was measured during the 12 months leading up to and including the enrollment date; post-implementation retention in care was measured from one day after the enrollment date to 12 months forward.
- Viral suppression was defined as an HIV viral load of < 200 HIV RNA copies/mL at the last test in the 12-month measurement period. Sustained viral suppression was defined as HIV viral loads < 200 HIV RNA copies/mL at the last two test results in the 12-month measurement period.

- Pre-implementation viral suppression measurement period began 12 months prior to the first comprehensive medication review (CMR); post-implementation viral suppression measurement began the day after the first CMR and extended forward 12 months.

Participant Retention

Because participant retention is not a criterion for the Linkage to, Retention in and Re-engagement in HIV Care (LRC) chapter, the Prevention Research Synthesis project does not evaluate that information.

Significant Findings on Relevant Outcomes

- Overall, a significantly greater proportion of participants were retained in care in the post-implementation period compared to the pre-implementation period (68.5% vs. 60.7%, relative percent change = 12.9%, p = 0.002). This significant effect was also found among the following subgroups:
  - Adults ≥ 50 years (70.2% vs. 62.5%, relative percent change = 12.3%, p = 0.029)
  - Males (68.8% vs. 60.4%, relative percent change = 13.9%, p = 0.005)
  - Blacks, non-Hispanic (73.2% vs. 59.7%, relative percent change = 22.6, p < 0.001)
  - Ryan White/ADAP recipients (78.2% vs. 63.9%, relative percent change = 22.4, p = 0.023)
- Overall, a significantly greater proportion of participants achieved viral suppression in the post-implementation period compared to the pre-implementation period (86% vs 75%, relative percent change = 15%, p < 0.001). This significant effect was also found among the following subgroups:
  - Adults 18-24 years (88% vs. 48%, relative percent change = 83%, p = 0.002)
  - Adults 25–34 years (75% vs. 60%, relative percent change = 26%, p = 0.009)
  - Adults 35–49 years (81% vs. 69%, relative percent change = 18%, p < 0.001)
  - Adults ≥50 years (92% vs. 86%, relative percent change = 8%, p = 0.001)
  - Black, non-Hispanic persons (78% vs. 63%, relative percent change = 23%, p < 0.001)
  - Hispanic persons (94% vs. 82%, relative percent change = 15%, p < 0.001)
  - White, non-Hispanic persons (95% vs. 81%, relative percent change = 17%, p < 0.001)
  - Males (89% vs. 78%, relative percent change = 14%, p < 0.001)
  - Females (77% vs. 68%, relative percent change = 14%, p = 0.006)
  - Transgender (86% vs. 50%, relative percent change = 71%, p = 0.025)
  - Medicaid recipients (81% vs. 71%, relative percent change = 14%, p = 0.002)
  - Medicare recipients (90% vs. 83%, relative percent change = 8%, p = 0.029)
  - Persons whose care was covered by the Ryan White program (80% vs. 65%, relative percent change = 23%, p < 0.001)
  - Persons with no insurance or whose insurance status is unknown (84% vs. 72%, relative percent change = 16%, p = 0.020)
  - Privately insured persons (94% vs. 72%, relative percent change = 31%, p < 0.001)
- Overall, a significantly greater proportion of participants achieved **sustained** viral suppression in the post-implementation period compared to the pre-implementation period (80% vs. 65%, relative percent change = 22%, p < 0.001). This significant effect was also found among the following subgroups:
  - Adults 25–34 years (69% vs. 39%, relative percent change = 76%, p < 0.001)
  - Adults 35–49 years (74% vs. 58%, relative percent change = 27%, p < 0.001)
  - Adults ≥50 years (86% vs. 77%, relative percent change= 11%, p = 0.002)
  - Black, non-Hispanic persons (70% vs. 53%, relative percent change = 32%, p < 0.001)
  - Hispanic persons (88% vs. 64%, relative percent change = 36%, p < 0.001)
  - White, non-Hispanic persons (88% vs. 75%, relative percent change = 18%, p = 0.012)
  - Males (82% vs. 68%, relative percent change = 22%, p < 0.001)
  - Females (72% vs. 60%, relative percent change = 21%, p = 0.005)

- Medicaid recipients (71% vs. 56%, relative percent change = 28%, $p < 0.001$)
- Persons whose care was covered by the Ryan White program (76% vs. 56%, relative percent change = 36%, $p = 0.005$)
- Persons with no insurance or whose insurance status is unknown (83% vs. 63%, relative percent change = 31%, $p = 0.011$)
- Privately insured persons (91% vs. 75%, relative percent change = 20%, $p = 0.033$)

Strengths

- None identified

Considerations

The PRS project did not evaluate the intervention for the Medication Adherence (MA) chapter because the intervention was tested with a one-group, pre-post study design.

Non-significant findings on relevant outcomes

- There were no statistically significant changes in retention in care between pre- and post-implementation of the intervention for the following:
  - Adults 18-24 years ($p = 0.784$)
  - Adults 25-34 years ($p = 0.169$)
  - Adults 35-49 years ($p = 0.094$)
  - Females ($p = 0.086$)
  - Transgender persons ($p = 0.294$)
  - Whites, non-Hispanic ($p = 0.623$)
  - Whites, unknown ethnicity ($p = 0.333$)
  - Hispanics ($p = 0.531$)
  - Other/unknown/missing race/ethnicity ($p = 0.231$)
  - Medicaid recipients ($p = 0.140$)
  - Medicare recipients ($p = 0.232$)
  - Recipients of multiple forms of insurance ($p = 0.121$)
  - Private insurance recipients ($p = 0.069$)
  - Uninsured or unknown/missing insurance information ($p = 0.771$)
- There were no statistically significant changes in viral suppression between pre- and post-implementation of the intervention for the following:
  - Other/unknown/missing race/ethnicity ($p=0.414$)
  - Whites, unknown ethnicity ($p=0.178$)
  - Recipients of multiple forms of insurance ($p=0.317$)
- There were no statistically significant changes in **sustained** viral suppression between pre-and post-implementation of the intervention for the following:
  - Adults 18-24 ($p = 0.102$)
  - Other/unknown/missing race/ethnicity ($p = 0.248$)
  - Whites, unknown ethnicity ($p = 0.739$)
  - Transgender persons ($p = 0.157$)
  - Medicare recipients ($p = 0.134$)
  - Recipients of multiple forms of insurance ($p = 0.157$)

Other related findings

- This intervention is also determined to be evidence-informed for the Structural Interventions (SI) Chapter.

- Black non-Hispanic participants (adjusted risk ratio (ARR) = 1.27, 95% CI = 1.08, 1.48, p = 0.003) and participants of other/unknown/missing race/ethnicity (ARR = 1.30, 95% CI = 1.07, 1.57, p = 0.007) were more likely to have been retained in care during the post-implementation period compared to white, non-Hispanic participants.

Implementation-related findings

- Participants with 1 or more pharmacist-clinic action plan were more likely to have been retained in care during the post-implementation period, compared to participants who did not have a pharmacist-clinic action plan, adjusting for baseline retention (ARR = 1.51, 95% CI = 1.18, 1.93, p = 0.001).
- Participants with 3 or more encounters with the pharmacist were more likely to have been retained in care during the post-implementation period, compared to participants with 1-2 encounters with the pharmacist, adjusting for baseline retention (ARR = 1.17, 95% CI = 1.05, 1.30, p = 0.004).

Findings from Subsequent Studies

Byrd et al., 2020 conducted a sub-analysis and examined whether PCHCM improved retention in HIV care, viral suppression, and adherence to psychiatric medications among persons with HIV and mental health conditions. The study also looked at whether persons with HIV and mental health conditions who adhere to their psychiatric medications have better retention in HIV care and viral suppression than those who are not adherent or not on psychiatric medications.

- Overall, a significantly greater proportion of participants with mental health conditions were retained in HIV care in the post-implementation period compared to the pre-implementation period (68% vs. 60%, relative percent change = 13%, p = 0.009).
  This significant effect was also found among the following subgroups:
  - Non-Hispanic Black (75% vs. 62%, relative percent change = 21%, p = 0.007)
  - Females (68% vs. 56%, relative percent change = 21%, p = 0.036)
  - Medicare insured (91% vs. 65%, relative percent change = 40%, p = 0.028)
  - Ryan White/ADAP recipients (80% vs. 62%, relative percent change = 29%, p = 0.023)
  - Non-psychotic disorder (67% vs. 60%, relative percent change = 11%, p = 0.043)
  - Diagnosed with baseline substance use (68% vs. 50%, relative percent change = 36%, p = 0.036)
- Overall, a significantly greater proportion of participants with mental health conditions achieved viral suppression in the post-implementation period compared to the pre-implementation period (90% vs 79%, relative percent change = 13%, p < 0.001).
  This significant effect was also found among the following subgroups:
  - 35-49 years old (87% vs. 73%, relative percent change = 19%, p = 0.001
  - ≥50 years old (94% vs. 87%, relative percent change = 9%, p = 0.008
  - Hispanic (98% vs. 85%, relative percent change = 14%, p = 0.040
  - Non-Hispanic black (84% vs. 64%, relative percent change = 32%, p < 0.001)
  - Non-Hispanic White (95% vs. 86%, relative percent change = 11%, p = 0.019)
  - Diagnosed with baseline substance use (86% vs 66%, relative percent change = 32%, p = 0.001)
  - Not diagnosed with baseline substance (90% vs. 82%, relative percent change = 11, p<0.001
  - Males (93% vs. 83%, relative percent change = 11%, p< 0.001)
  - Females (82% vs. 71%, relative percent change = 16%, p = 0.032)
  - Medicaid (86% vs 71%, relative percent change = 20%, p = 0.005)
  - Medicare insured (90% vs. 75%, relative percent change = 20%, p = 0.030)
  - Multiple medical insurance (97% vs. 88%, percent change = 11%, p = 0.026)
  - Non-psychotic disorder (91% vs. 80%, percent change = 13%, p < 0.001)

- Overall, there was no significant difference between the pre- and post-implementation periods for adherence to psychiatric medications.
- After adjusting for baseline retention in care, there were no significant differences in the proportion of persons retained in care by adherence level in any psychiatric drug grouping (including persons not on therapy), post implementation.
- There were also no significant differences in the proportion of persons virally suppressed by adherence level in any psychiatric drug category (including persons not on therapy), post implementation.

Shrestha et al., 2020 examined the cost and cost-effectiveness of PCHCM. The study was a sub-analysis using three project sites (Albany, GA; Chicago, IL; Kansas City, MO) that reported complete cost data. Intervention effectiveness was measured as the incremental number of patients virally suppressed (HIV RNA <200 copies/mL at the last test in a 12-month measurement period). Micro-costing direct measurement methods were used to estimate intervention costs. The cost per patient, cost per patient visit, and incremental cost per patient virally suppressed were calculated from the health care providers' perspective. The number of HIV transmissions averted, lifetime HIV treatment cost saved, quality-adjusted life years (QALYs) saved, and cost per QALY saved were calculated from the societal perspective, using standard methods and reported values from the published literature.

- *Cost*:
  - Overall, the annual intervention cost (i.e., combined clinic and pharmacy costs) was $226,741. This cost was composed of the annual clinic cost of $74,043 and the annual pharmacy cost of $152,698.
  - The overall average cost per patient was $813, which includes the average clinic cost of $265 and average pharmacy cost of $547.
  - The overall average cost per patient visit was $48, which includes the average clinic cost of $35 and average pharmacy cost of $59.
- *Cost-effectiveness:*
  - Overall, the incremental cost per patient virally suppressed was an estimated $5,039.
    - The estimated number of HIV transmissions averted was 2.75.
    - An estimated 12.22 quality adjusted life years (QALYs) were saved.
    - An estimated $1.28 million in lifetime HIV treatment costs were saved.
  - Overall and at each project site, the intervention was cost-saving as the program cost was lower than the lifetime HIV treatment cost averted.

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