



POSITIVELINKS INTERVENTION



Center for
Innovation and
Engagement

Funding Background

HRSA's Ryan White HIV/AIDS Program (RWHAP) provides a comprehensive system of HIV primary medical care, essential support services, and medications for low-income people living with HIV who are uninsured and underserved. The Program funds grants to states, cities, counties, and local community-based organizations to provide care and treatment services to people living with HIV to improve health outcomes and reduce HIV transmission among hard-to-reach populations.

NASTAD's Center for Innovation and Engagement (CIE) is funded by HRSA's HIV/AIDS Bureau (HAB), Special Projects of National Significance (SPNS), under a three-year initiative entitled Evidence-Informed Approaches to Improving Health Outcomes for People with HIV (PWH). The purpose of this initiative is to identify, catalog, disseminate, and support the replication of evidence-informed approaches and interventions to engage PWH who are not receiving HIV health care or who are at risk of not continuing to receive HIV health care.

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Intervention Overview & Replication Tips

Why This Intervention?

PositiveLinks (PL) is a clinic-centered engagement in care program that employs a tailored smartphone application (app) with a private digital social support community to help people with HIV reach their care goals. The PositiveLinks platform is a complete integrated solution comprising the smartphone app (for iOS and Android), HIPAA-compliant secure messaging, patient dashboards, and administrative portals that can be linked to patient lab records. The PositiveLinks platform has been tested and shown positive outcomes with a diverse community of members across age, ethnicity, sex, gender identity, HIV risk factors, education, and employment levels.

PositiveLinks enhances engagement in care and a broader virtual community with alerts, reminders, and text messaging.¹² PositiveLinks is built on an approach called *warm technology* that uses the power and reach of communication technology and keeps the focus firmly on human connection and support. Warm technology enables PositiveLinks to provide holistic support to a private and protected intentional community, tailored to its members. Rather than replacing more intimate

forms of communication, PositiveLinks increases the connection among community members, and between members and their care providers, in a cost-effective way.

PositiveLinks is deployed by a clinic or community-based organization (CBO) whose enrolled clients are referred to as members, encouraging clients to see themselves as part of a larger community.

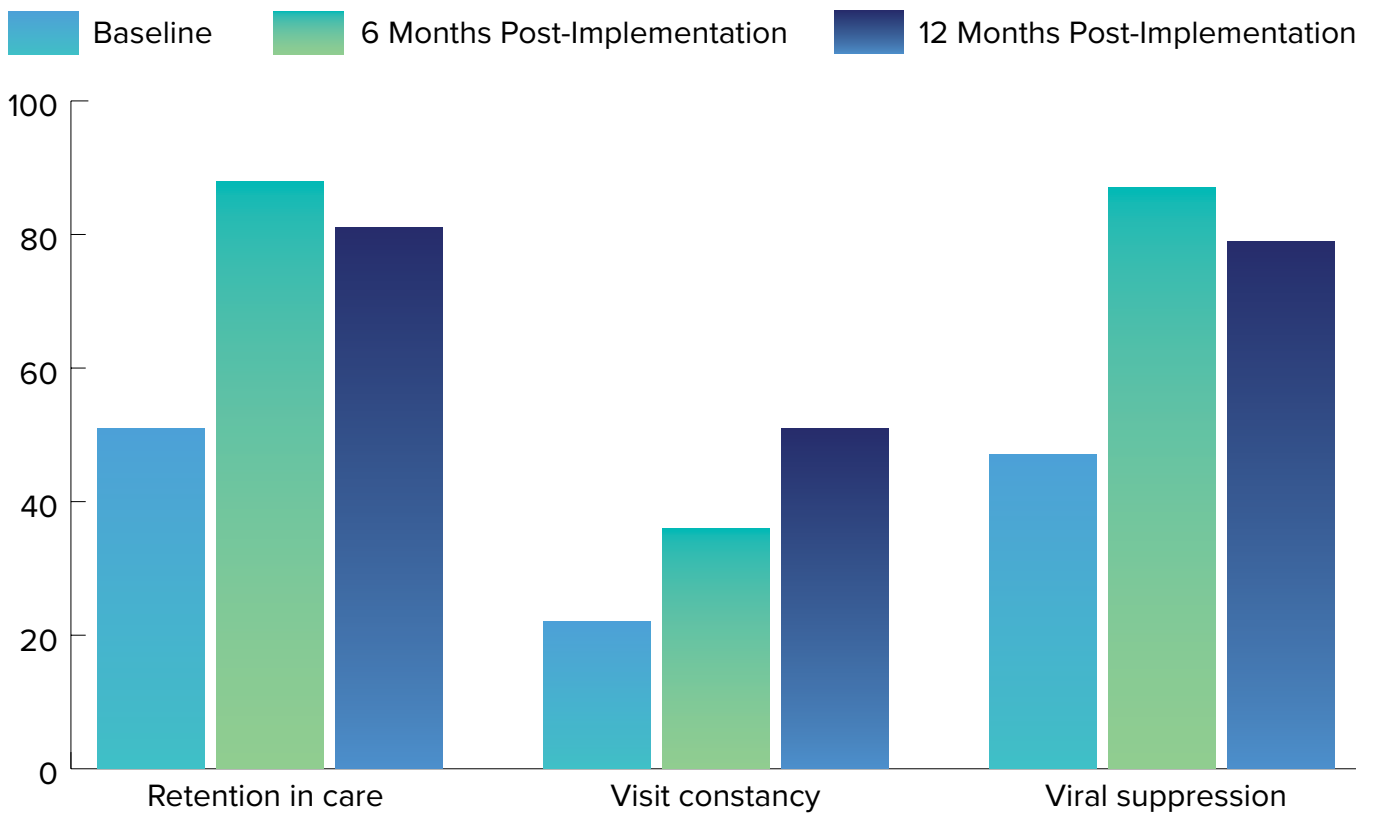
Smartphone apps such as PositiveLinks effectively address multiple barriers to optimal care, including social and geographic isolation.^{1,3} An evaluation of the PositiveLinks program demonstrated that a clinic-affiliated smartphone app paired with care coordination can produce significant changes in engagement in care and clinical outcomes for people with HIV. In a pilot study, PositiveLinks improved CD4 counts, viral suppression, and retention in care (defined as having a minimum of two HIV medical care encounters at least 90 days apart within a year).¹

The intervention also improved rates of visit constancy (defined as the proportion of four-month time intervals in which one visit with an

HIV care provider was completed in a year) (Figure 1). Participant interviews and qualitative analysis of the app’s community message board found that the app provided a sense of connection and social support.¹ In 2020, the intervention developers reported continued

significant improvements in engagement in care and viral suppression as far out as 24 months post-implementation.⁴ PositiveLinks was designed to address clients’ intersecting needs and lifestyles, which significantly contributed to its success.²

Figure 1 — PositiveLinks: Percent Retention in Care, Visit Constancy, and Viral Suppression, Baseline vs. 6- and 12-Months Post-Implementation



Source: Dillingham, R., Ingersoll, K., Flickinger, T. E., Waldman, A. L., Grabowski, M., Laurence, C., Wispelwey, E., Reynolds, G., Conaway, M., & Cohn, W. F. (2018). PositiveLinks: a mobile health intervention for retention in HIV care and clinical outcomes with 12-month follow-up. *AIDS Patient Care and STDs*, 32(6), 241–250. <https://doi.org/10.1089/apc.2017.0303>

“I think in our rural-based clinic that serves the western half of Virginia, 52 counties, this was a real opportunity to build community in a way that we hadn’t truly anticipated when we started this, but which has definitely exceeded our hopes and dreams.”

– POSITIVELINKS PROGRAM DIRECTOR

Intervention at a Glance

This section describes the general process for implementing PositiveLinks at your site. This mHealth platform was developed and tested at the University of Virginia (UVA) Ryan White HIV Clinic, a RWHAP–funded clinic in Charlottesville, Virginia, and has been implemented as usual care service at the UVA Ryan White Clinic and partner sites since 2017. The steps below will help you understand the steps required for implementing the PositiveLinks platform and tailoring it to fit your needs. The PositiveLinks implementation team will work in tandem with and provide technical assistance, including training, to organizations at each and every step. The PositiveLinks intervention was funded and evaluated by the HRSA RWHAP Part A grant.

 <p>Step 1</p>	<p>Assess Readiness and Capacity</p> <p>To identify intervention priority populations, discuss service delivery gaps and health inequities both within and outside the care site. Gather input from potential users, including clients, providers, and clinical staff, to gauge interest in using the app and identify desired app features. Determine the required number of staff and their roles and how to sustain the intervention financially.</p>
 <p>Step 2</p>	<p>Explore Information Technology (IT) Infrastructure</p> <p>Meet with IT staff to understand the Data Security and Compliance review and approval processes often required for implementing a mobile-based platform. Identify a member of the IT team to provide technical assistance and security support for the review and approval processes. Consider whether your organization will integrate the platform with current systems such as electronic medical records (EMRs).</p>
 <p>Step 3</p>	<p>Develop a Plan and Protocols for Sites and Partners</p> <p>Determine the type of data the sites will collect, the frequency of internal and external reporting, the app components that are feasible to implement, and the processes for monitoring and evaluation. Create a comprehensive recruitment strategy and identify an initial cohort of clients. Create and share an implementation plan with stakeholders to ensure that all parties understand intervention milestones, deliverables, and deadlines.</p>
 <p>Step 4</p>	<p>Recruit and Train Staff</p> <p>Generate job postings to and hire key staff, such as a PositiveLinks Coordinator (PLC). Determine site training needs for Strengths-Based Case Management (SBCM) and Motivational Interviewing (MI), two key approaches for implementing this intervention. Conduct provider and administrator training and have providers demonstrate proficiency on the PositiveLinks platform.</p>
 <p>Step 5</p>	<p>Implement the Intervention</p> <p>Launch and disseminate information about the PositiveLinks program to clients. Enroll and train clients on using the PL app. PLC will provide ongoing training as needed to clients and providers on using the platform.</p>
 <p>Step 6</p>	<p>Monitor and Evaluate the Intervention</p> <p>Facilitate conversations with staff, providers, and clients to gather feedback on the intervention. Note outcomes at specific time intervals. Use data to modify client and provider engagement strategies to optimize use of the platform as necessary.</p>

Cost Analysis

The PositiveLinks intervention was funded by a HRSA RWHAP Part A grant and other institutional funding. The federal program supports direct care and treatment services, and Part A is used to provide core medical and support services for people with HIV. Support services that enhance HIV care for people with HIV can also be funded through Part A. HRSA's RWHAP Fact Sheet provides more context on the different parts. Additionally, RWHAP's Policy Clarification Notice 16-02 outlines details on allowable costs. (See Additional Resources Box).

If you would like to conduct a cost analysis of implementing this intervention locally, please see the Additional Resources Box at the end of this document to access a cost calculator to input your local data and an instruction manual.

Resources Assessment Checklist

The following is a list of key decisions your organization will make and tasks to complete in its pre-implementation phase. Additional tools and resources for pre-implementation of PositiveLinks can be found in the Decision Task Checklist, Pre-Implementation Reflection, and Site Readiness Checklists provided by the team at UVA Health's RWHAP-funded clinic in central Virginia. (See Additional Resources Box).

Stakeholders

- Have you identified a strong intervention champion on the case management team or at the leadership level?
- Have you engaged clients, site staff, providers, and partners to integrate their feedback about the intervention?
- Have you gathered information from clients about barriers to engagement in care and viral suppression?

Technology and Computer Systems

- Have you discussed the feasibility of implementing a mobile-based platform and an accompanying portal with IT staff?
- Will the care site provide smartphones? Phone cases? Data plans?
- Will the intervention include integration with EMRs or another client portal?
- Is an IT staff member or team available to consult and provide ongoing technical assistance as needed?

Staff Capacity and Responsibilities

- Do you have support from key care site leadership staff to facilitate PositiveLinks at your site?
- Do staff understand the benefits and goals of PositiveLinks?
- Does your organization have mechanisms in place to recruit a PLC internally or externally?

- Does your organization need to hire an evaluator for the project, or can a staff member at the care site take on evaluation responsibilities as part of their existing duties?
- Does your care staff have the capacity to schedule and complete PositiveLinks-related training sessions? Have they received this training in the past?
- Have you identified any additional training needs?
- Does your organization have a culture of using SBCM (a counseling strategy that builds on a person's successes)⁸ or MI (a counseling method that focuses on facilitating and engaging intrinsic motivation within clients to change behavior)?⁹ For example, do staff have experience with SBCM or MI? Do you have the resources to train and support staff in using SBCM or MI with clients?
- Have you performed a workflow assessment at your care site?

Security and Privacy Protocols

- Does your organization have the capabilities and resources to provide smartphones and to cover the related costs (e.g., phone cases, data plans) if necessary?
- Have you documented that PositiveLinks products are HIPAA-compliant?
- Have you identified policies and procedures at your site that must be in place before implementation of the PositiveLinks intervention?

Security and Privacy Protocols *(continued)*

- Will you require clients to encrypt or use secure passwords on their smartphones?
- Do you have a protocol in place to replace smartphones that are lost or broken?
- Are all components of the app feasible for use by your clients?
- Do you have a protocol in place for responding to an app feature malfunction?

Project Budget

- Do you have funding to support all the intervention components (e.g., smartphones, app development, portal maintenance, staff time, care coordination)?
- Is a sustainability plan built into the proposed funding source for this intervention?

Monitoring and Evaluation Plan

- Have you established the desired measurable outcomes?
- Have you decided what data you will collect? At what intervals? Who will be responsible for data collection?
- Have you decided how data will be collected?

Outreach Plan

- Have you identified specific roles related to the PositiveLinks intervention for partner organizations within your system of care?
- Have you established referral protocols, memorandums of agreement (MOAs), or memorandums of understanding (MOUs) with existing community partners?
- Has your care site identified client recruitment plans?

Setting the Stage

According to the U.S. Centers for Disease Control and Prevention (CDC), there are an estimated 1.1 million people with HIV in the United States.¹⁰ During 2018, approximately 75.7 percent of people with HIV received HIV medical care, 57.9 percent were retained in care, and 64.7 percent were virally suppressed.¹¹ People with HIV who receive ongoing, regularly-scheduled care are more likely to have significantly lower viral loads, higher CD4 cell counts, reduced morbidity and mortality, and improved overall health than those who missed even one medical visit over a two-year period.¹² (Receipt of medical care is defined as a client taking one or more tests [CD4 or viral load] in the measurement year).

Although significant strides have been made in ensuring that people with HIV effectively progress through the HIV care continuum, these figures demonstrate that retention continues to be a critical issue. In 2014, approximately 38 percent of people with HIV were not in care and were, therefore, more likely to not be virally suppressed.¹² Interconnected factors contribute to poor engagement in care, including race, age, gender, socioeconomic status, comorbidities, unmet psychosocial needs, and client distrust in physicians and health care institutions.¹ In the rural southern United States, inequities in HIV care disproportionately affect vulnerable populations who experience racial inequality, poverty, stigma, trauma, lack of social support, and substance use disorders.¹ Improving client engagement and reengagement in care is a national priority with tailored retention measures established by the National HIV/AIDS Strategy (NHAS), the Health Resources and Services Administration (HRSA), and the End the HIV Epidemic (EHE) initiative, among others.



According to the Virginia Department of Health, in 2018, 24,906 Virginia residents were known to have HIV.¹³ The majority were Black or African American (58 percent); gay, bisexual, or other men who have sex with men (48 percent); aged 45–64 years (53 percent), and had some evidence of medical care in 2018 (68 percent).^{13,14} Of the 77 participants in the original PositiveLinks intervention, 64 percent were men, 49 percent Black or African American; 34 percent White, non-Hispanic; and 8 percent Hispanic. More than half of participants reported incomes below 50 percent of the federal poverty level. Participants traveled an average of 37 miles (47 minutes) to the HIV clinic; the maximum distance traveled was 200 miles (127 min). PositiveLinks used different approaches to address disparities, including incorporating design modifications for people with low literacy levels and increasing access to health care resources for rural populations.¹

Description of the Intervention Model

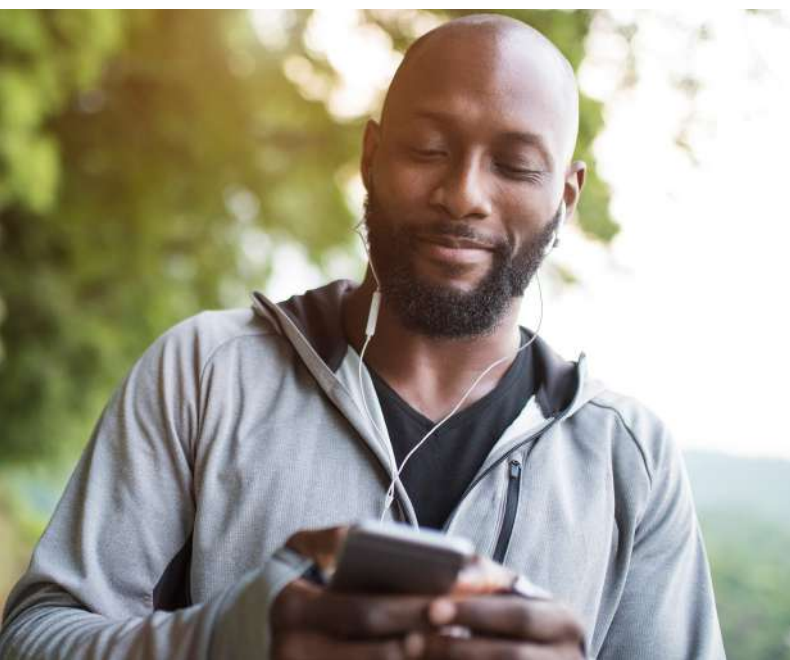
PositiveLinks provides virtual care coordination, self-management tools, and social support to people with HIV. These efforts ensure that people with HIV who are not linked to or engaged in HIV medical care can successfully improve their health outcomes and address barriers to transportation or clinic access. PositiveLinks should be implemented with the intention of making it part of the standard of care for people with HIV. The PositiveLinks intervention developers created a manual that includes detailed guidelines for planning, implementing, and integrating PositiveLinks into practice. (See Additional Resources Box). The following is a summary of the intervention's six overarching phases:

1. Assess Readiness and Capacity

a. *Identify Priority Populations:* Before implementing PositiveLinks, determine which groups will benefit most from the intervention. To gain a broader understanding of potential service delivery gaps, determine the percentage of clients meeting benchmarks for linkage and retention in medical care. Collect and analyze baseline data to decide which groups have lower rates of viral suppression and greater gaps in care. Use institutional knowledge and data, current academic literature, and state and national data on linkage, retention, and medical adherence to determine the intervention's priority populations. Conduct focus groups with clients

to understand how they use smartphone-based technology and assess how interest in and usage of the PositiveLinks app may vary based on factors such as age, gender, and educational attainment level.

- b. *Determine Care Site Staffing Roles and Hiring Needs:* Ensure that staffing is adequate to provide technical assistance for the app, coordinate care, and monitor outcomes or feedback from clients and providers. Establish a relationship with an IT team member to provide initial technical assistance for the app and its data-sharing processes. A PositiveLinks liaison, such as a PLC, serves as the front-facing staff member for the program and is integral to the intervention's success. Ideally, your care site will hire a full-time PLC, but it is also possible for two staff members to share the PLC position. The PLC should be available consistently to provide ongoing client support within the clinic or wherever services are delivered. During pre-implementation activities, decide which institutional stakeholders need to be consulted about staffing requirements and whether the team already has a PLC candidate or will need to hire one. This requires maintaining open lines of communication with hiring managers and confirming whether any staff roles or responsibilities will change as a result of implementing PositiveLinks at the care site.
- c. *Secure a Funding Source for the Intervention:* Your budget development process will vary depending on your organization and whether you plan for full or limited implementation of the intervention. Correspond with internal stakeholders (e.g., budget managers, clinic directors) to explore existing funding streams and funding opportunities. Ideally, the budget should include funding to support one full-time PLC, a percentage of administrative time to manage the PLC, and part-time support of an evaluator or data manager. The budget should also include smartphone-related costs (e.g., phones, cases, data plans) and the costs of computer equipment to perform intervention tasks, transportation for clients, incentives to increase client engagement, staff training, and certification.



d. *Engage Stakeholders:* Collect information from potential clients, clinic staff, and providers (e.g., via surveys, focus groups, meetings) about challenges clients are experiencing with achieving sustained viral suppression and remaining engaged in HIV care, frustrations with the health care system, and the interconnected social determinants of health that can hinder the achievement of positive health outcomes. Initial conversations with stakeholders can focus on:

- Identifying and understanding the barriers to achieving health goals;
- Introducing the concept of warm technology; and
- Demonstrating what PositiveLinks can offer to address some of those barriers (e.g., decreasing social isolation or enhancing existing linkage efforts).

Inquire about the overall success of current site programs and how these efforts can integrate with PositiveLinks. Whether at the case management, operational, or leadership level, strong champions for the program are also important. These conversations can help to match expressed needs with the capacities of the PositiveLinks platform. Once your care site's PositiveLinks app has been developed, ask stakeholders to test early versions of the app, and give feedback on usability.

2. Explore Information Technology Infrastructure

a. *Determine Hardware, Software, and Computer System Needs:* PositiveLinks may be integrated with EMR systems. An example is Epic, a cloud-based system that is used across a broad range of healthcare practices. Assess whether your site uses similar systems or client portals that can integrate with

PositiveLinks. If your site does not have access to secure electronic messaging with clients, PositiveLinks provides a method of protecting communication within the app that is more secure than SMS texting.

- b. *Ensure App Accessibility:* Discuss different ways to modify the app to meet the accessibility needs of your client population. Smartphones offer a range of settings to optimize the app's accessibility by integrating text-to-speech or speech-to-text compatibility, enabling adjustments to text size, color, and brightness, and including captions in videos.
- c. *Establish Smartphone Policies:* Before implementation, ensure that resources are available to purchase the required technological resources. Offer potential clients who already have a PositiveLinks-compatible smartphone (i.e., an iOS or Android phone) the option to use the app on their device. Depending on available resources, explore providing clients with smartphones. This may require establishing smartphone contracts and providing data plans, stipends, and equipment protection. Establish a relationship with a phone company and choose a data carrier that optimizes price and area coverage.



Adaptation

If system integration is not feasible, the PLC or another PositiveLinks administrator can enter data manually via the PositiveLinks portal.



d. *Research IT Security Protocols and Address Security Concerns:* Take appropriate measures to ensure client security and privacy to meet HIPAA requirements in technological systems and operations. Approval processes vary by institution, and it is essential to have conversations with IT staff about security protocols from the outset. Work with IT staff to:

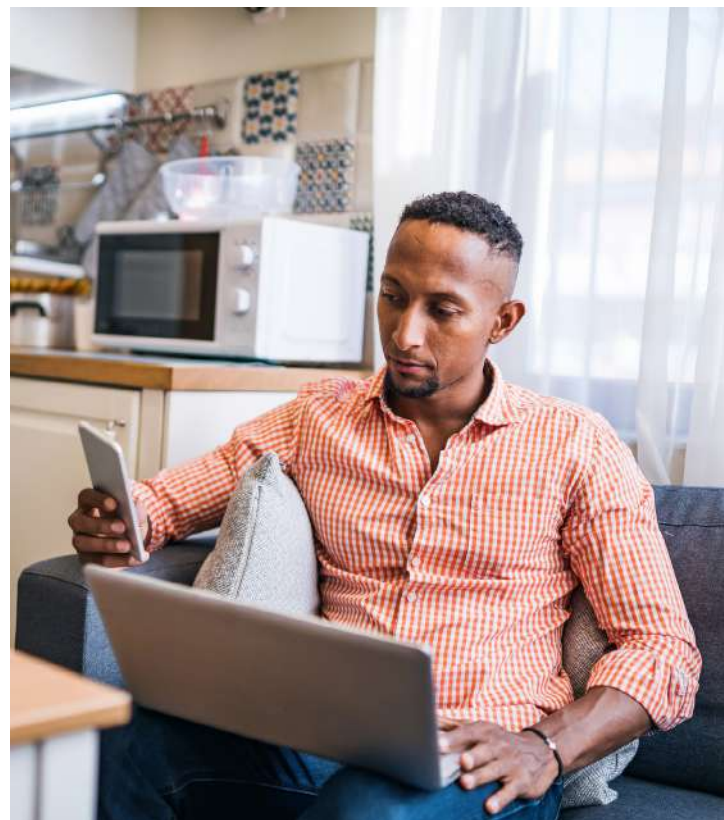
- Discuss the security level of your site’s computers and databases.
- Gather information on the steps needed to fulfill your organization’s IT, compliance review, and approval processes before implementing the intervention.
- Decide whether clients who use the PositiveLinks app on their own smartphones will be required to encrypt their phones.
- Designate the personnel who will be authorized to work on the PositiveLinks web portal.

e. *Select App Features:* The PositiveLinks platform is meant to be modular, allowing components to be customized to fit each site’s needs. For example, one site preferred not to incorporate a messaging feature because they already had a messaging system that worked well for their clients. You can customize the app to meet your clients’ and organization’s needs without eliminating core features (e.g., self-monitoring, social support) or tailored resources and information. Platform content is managed by your PositiveLinks staff via a web portal. Administrators may add or edit client and provider accounts on the portal, so it is important to establish which staff roles have access to specific information within the portal.

App features for clients’ use may include the following:

- **Check-in Queries:** Push notifications at set times guide clients to the PositiveLinks home screen. Once there, clients will be asked to answer questions such as *“Did you take your medications today? (Yes/No)”* (replies can be customized) and *“What is your stress level? (Scale of 1–10)”*

- **“How Am I?”:** Clients can view their responses to medication, mood, and stress check-ins over time. The landing screen shows a monthly calendar accompanied by weekly averages for medication adherence. A range of emojis displays daily mood responses (e.g., very happy, happy, OK, unhappy, very unhappy). Daily stress responses are displayed by color-coded bars (e.g., green bars indicate low stress; yellow bars, medium stress; red bars, high stress). Responses may be displayed for a calendar month or a selected day.
- **Lab Results:** Lab values are graphically displayed to enable clients to see patterns over time and track their most recent levels. Ideal ranges for CD4 count and viral load are also shown. Clients can choose to see their lab results for specific dates. CD4 and viral load data are either transferred from the EMR or manually entered by PositiveLinks administrators on the PositiveLinks portal.



- **Community Posts:** This is a private digital support community where clients can anonymously post new topics or respond to existing posts. During enrollment, each client selects an alias, or username, by which they are known to the PositiveLinks community. They can select an avatar to represent themselves. PositiveLinks administrators and coordinators may view community posts, but providers may not.
- **Appointment Reminders:** Notifications display on the home screen within the app to remind clients of appointments. Appointment information is either transferred from the client's EMR or manually entered by PositiveLinks administrators. Appointment data include the date, time, and location of the appointment and the provider's name. Clients may also use this feature to add their own reminder notifications. They can select the appointments tab to view upcoming appointments either on a calendar or as a list.
- **Documents:** Clients can upload photos of documents to share with their providers. These may include documents required for clinic eligibility, insurance, or housing purposes; images; photo IDs; and paystubs.

Clients may select which providers can view the uploaded documents.

- **Messages and Contacts:** Clients can send and receive secure messages from the care team in a format similar to SMS texting or online chat. Staff can set up this feature to be notified by email when a client sends a message. The contacts feature is used by sites to curate a site-specific list of care-team members (e.g., front desk, HIV care providers, mental health providers, medical case managers) for their clients.
- **Resources:** This feature allows your site to customize a collection of web-based resources (e.g., audio and video files, website links) to provide information relevant to your clients. Topics may include stress management, social support, mindfulness, stigma, and health and social resources for lesbian, gay, bisexual, transgender, queer, intersex, and asexual (LGBTQIA+) people.
- **Questions:** This feature provides answers to common questions that people with HIV have. It connects clients to high-quality, accurate, detailed information and websites or the care team members.



- **Quizzes:** This feature allows sites to create quizzes on HIV-specific topics that enable clients to reflect on their own experiences. Clients can see their quiz responses and the correct response if they respond to a question incorrectly. Responses can also help sites assess potential knowledge gaps (e.g., if many clients missed questions about how resistance to antiretroviral therapy works, staff can upload resources on this topic).
- **Weekly Summaries:** This is a weekly notification that displays on the app home screen, summarizing medication adherence, mood, and stress check-ins for the past seven days. This feature helps clients track their progress and reflect on their responses.
- **Achievements:** To motivate clients to maintain behaviors and continue using the app, achievement badges display on each client's profile for engagement behaviors and for reaching specific benchmarks (e.g., 100 percent adherence).
- **Appointments:** Providers and other staff can view upcoming client appointments.
- **Lab Results:** Providers can see a client's CD4 and viral load results.
- **Services (Restricted Access):** Certain provider roles (e.g., community health workers) can document their interactions with clients for tracking purposes or reporting the delivery of services to clinic administrators or other stakeholders.
- **Messages/Chat:** Providers can securely send messages to and receive messages from clients in a format similar to SMS texting.
- **Resources:** Providers can see the resources available to clients in the app.

Web portal features for providers' use may include the following:

- **Availability:** Providers can indicate their availability to clients (e.g., available, out of office).
- **Member Search:** Providers can search for clients by member username or last name to locate their member dashboards, calendar summaries, documents, and messages between the provider and the client.
- **Summary Page:** This feature displays a client's name and their monthly calendar of check-in responses.
- **Dashboard:** This feature shows graphical displays of clients' check-in responses for medication, mood, and stress over three time periods: one week, one month, and cumulative (since enrollment).
- **Documents:** Providers can upload photos of documents to a client's user account and can view and share them with the client and other providers.

- f. *Create a Workflow.* Before implementing PositiveLinks, create a workflow to determine roles, responsibilities, budget, and other day-to-day project management. This will help to determine how best to integrate PositiveLinks in a way that strengthens a site's continuity of care. New care systems take careful planning and strategizing, and it is important to intentionally think through how PositiveLinks will complement or change existing workflows. Follow up with key stakeholders (e.g., HIV primary care providers, nurses, social workers, case managers, mental healthcare providers, community health workers, front desk staff, clients) to determine how the app will enhance or change their work. Conversations may focus on how a dashboard shared by clients and providers can be useful for care and how the intervention can become a seamless part of standard practice. Consider allowing staff to test the beta version of the app.

3. Develop a Plan and Protocols for Sites and Partners

- a. *Create a Monitoring and Evaluation Plan:* Determine the appropriate time points for and duration of client enrollment, monitoring, and evaluation. Create a list of outcomes and measures to determine whether and to what extent goals are met (e.g., a 30 percent increase in viral suppression rates). The evaluator (if one is hired) can collect

additional demographic data and information on retention indicators and lab values to track client outcomes.

- b. *Produce an Outreach, Marketing, and Recruitment Strategy:* Recruitment strategies work best through a referral system among care site staff, the community, and clients. Maintaining good relationships with community organizations is imperative. To address potential gaps and avoid missed opportunities, develop clear marketing and educational materials for both the care site and community partners. To increase client engagement in the intervention, ensure that marketing and educational materials feature affirming and inclusive messaging. Proactively request feedback from partners and address any issues that arise in a timely manner. If your organization is working with partner agencies to offer PositiveLinks as a resource, create MOUs or MOAs to clearly define and delineate the staff roles at the care site and partner organizations.
- c. *Finalize an Implementation Plan:* Ensure that all parties are knowledgeable about milestones, deliverables, and deadlines by creating an implementation plan and sharing it with stakeholders. Optionally, create a project management tool, such as a Gantt chart, that can be used to track intervention implementation progress.

4. Recruit and Train Staff

- a. *Begin Recruitment:* Finalize staff roles and responsibilities and set up an accessible job application process. To ensure that you have a pool of diverse and representative job candidates to choose from, leverage your existing networks and systems (e.g., job boards, client relationships) in the broader community to fill positions either internally or externally. Consider members of your priority population who may have previously been involved with the clinic. These individuals' experiences may help them to relate to and bond with clients.



- b. *Train Staff, Administrators, and Providers:* Ensure that staff complete the PositiveLinks training program, conducted by the PositiveLinks Implementation team. This training may be delivered either in person or remotely using a video-based system such as Zoom. It can be supplemented by online learning modules and certification. Before implementing PositiveLinks, site staff should demonstrate proficiency in using the app and portal's features and administrative components.

It is helpful if staff engaging with clients are trained in SBCM and MI. The best results with PositiveLinks are seen in organizations with an integrated culture of SBCM. Practitioners of SBCM at the care site include receptionists, social workers, medical case managers, retention and linkage specialists, nurses, phlebotomists, and care providers.

5. Implement the Intervention

- a. *Reach Out to Clients:* Brainstorm innovative ways to reach out to clients who may benefit from the intervention (e.g., referral by providers at the care site). The PLC can then reach out to the potential clients to provide information about PositiveLinks and schedule a time and date for enrollment.

- b. *Enroll Clients and Provide Orientation:* The PLC should allocate a time frame for enrollment (ideally between 45 minutes and two hours). A wider time frame allows the PLC to address individual needs and technical literacy skills, as some clients may not have used a smartphone before. Before enrolling, potential clients should clearly understand the intervention, be aware of potential risks and benefits, and agree to participate. Completion of the PositiveLinks Services and Program Agreement form is an important step in this process.

The PLC may enroll clients in person or remotely, in a private space if possible. The enrollment process might look like this:

- The potential client learns about PositiveLinks or is referred by a provider at a care site and expresses interest in the program.
- The PLC contacts the potential client by email, phone, or in-person to schedule a consent and enrollment session and determine whether the client has a smartphone.
- The PLC facilitates a meeting with the client, shares the program's benefits and risks, acquires consent, and, if needed, provides the client with a smartphone.
- The PLC orients the client to the smartphone and data plan (if applicable), explains how to use the app's features, and helps them choose their profile preferences.

This includes confirming that the client understands how to engage with the digital support community, which provides access to valuable social support and anonymous connection to other people with HIV.

- c. *Use PositiveLinks to Engage and Retain Clients in Care:* PositiveLinks communication tools allow the care sites to integrate supportive methods into routine care, extend the reach of health services, and increase communication with clients beyond typical in-person appointments. Upon program launch, *encourage* clients to use the app and share feedback. Consider incentivizing clients to use the app by coordinating fun and engaging activities such as weekly quizzes and monthly raffles.

6. Monitor and Evaluate Intervention

- a. *Monitor Client Outcomes and App Use:* Conduct ongoing monitoring of client self-reported data. Respond to changes that may be noticed on member dashboards, displaying patterns daily or weekly and over a range of time. Automated reports of “actionable data” are available from the administrative portal to support such monitoring. Staff can track client outcomes (e.g., lab values and visit consistency) and engagement levels with the app (e.g., percentage of check-in responses, community engagement, quiz engagement, client messaging, total app logins).

“We were really trying to think about how to extend strengths-based case management to a population that had [challenges engaging in care] for a variety of reasons, both geographic and resource-related for coming in for visits.”

– POSITIVELINKS PROGRAM DIRECTOR

Logic Model

Logic models are effective tools to assist in planning, implementing, and managing an intervention. Below is a logic model highlighting the resources, activities, outputs, outcomes, and impact of the PositiveLinks intervention referenced throughout this guide.

Resources	Activities	Outputs	Outcomes	Impact
<ul style="list-style-type: none"> • RWHAP, EHE, research, or another funding source that supports technology-based linkage interventions • Organizational culture steeped in SBCM and MI approaches • Relationships and collaborations with health system leadership, IT, clinical staff, and client population • EMR system (optional) 	<ul style="list-style-type: none"> • Engage stakeholders and obtain community input • Develop recruitment and implementation plan • Gather feedback from clients and key staff to assess platform suitability • Train staff and providers to use the app • Recruit and enroll clients • Provide ongoing support to all users • Monitor and evaluate client outcomes, responses, and feedback from the broader PositiveLinks community • Assess need for app enhancements to tailor the platform to meet the organization's goals 	<ul style="list-style-type: none"> • Mobile phone app reflective of organizational and client needs • Providers and clients informed about the benefits of the app • Consistent use of the app by the PositiveLinks community to input and access information • Client engagement with the clinic support community • Appointments available for clients' acute needs within 24 hours 	<p>Among people with HIV:</p> <ul style="list-style-type: none"> • Client satisfaction with a self-monitoring mechanism to improve health • Regular attendance at appointments • Increased satisfaction with health care and social resources • Improved ability to identify stressors and coping strategies • Improved self-efficacy to start and stay in care • Improved trust in the health system • Improved access to acute care • Decreased time to HIV care reengagement • Improvement in HIV and overall health outcomes • Decreased social isolation and internalized HIV stigma <p>Within the implementing agency:</p> <ul style="list-style-type: none"> • Enhanced infrastructure to better serve clients • Demonstrated investment in the client population and HIV relinkage efforts • Expansion of ARTAS counseling to clients • Improved retention in care • Improved HIV clinical outcomes 	<ul style="list-style-type: none"> • Reduced HIV morbidity and mortality • Reduced HIV transmission • Improved health equity for people with HIV

Staffing Requirements & Considerations

Staff Capacity

The following staff implemented PositiveLinks at University of Virginia (UVA) Health's RWHAP-funded clinic and its partner sites:

- *PositiveLinks Implementation Manager*: In the original intervention, staff reported to a PositiveLinks Program Director and Senior Implementation Specialist. Supervision structure is contingent on the organization's size and staff resources (e.g., there may already be data managers). In smaller organizations, staff may report to the Clinic Director or the person who oversees case management services. PositiveLinks leadership responsibilities include:
 - Overseeing the program;
 - Providing ongoing support and mentorship;
 - Managing high-level components of the project; and
 - Articulating how PositiveLinks fits within their site's strategic vision for holistic client care and engagement that goes beyond the typical care site visit.
- *PositiveLinks Coordinator (PLC)*: The PLC is integrated within the case management team, has a consistent presence in the clinic, and establishes meaningful relationships with providers and other key clinic staff. The PLC is the primary point of contact for providers and clients. This should be a full-time position, although it may be separated into a data management and analysis role and a direct service-delivery role. In this situation, however, it is critical that the two PLCs collaborate closely and act based on reported data. While one PLC is enough, it will be important that another staff person is cross-trained and can step in if the PLC is unavailable. (See Additional Resources Box). The PLC's responsibilities include:
 - Managing enrollment, training, and accounts;
 - Providing technical support to clients, providers, and care-site staff;
 - Collecting, reviewing, and analyzing data;
 - Training site staff on counseling, health education, and care coordination;
 - Observing the community message board and all cohort messages;
 - Weekly monitoring and reporting on client and provider use of the platform;
 - Conducting engagement and retention follow-up with clients who are not using the app;
 - Maintaining accurate, timely content in the Resources and Questions features of the app;
 - Creating weekly quizzes for clients;
 - Providing support for data management and analysis;
 - Documenting any technical issues related to PositiveLinks and communicating with the implementation team for troubleshooting; and
 - Helping clients to develop technological literacy skills.

- *Care-Site Provider(s)*: Care-site HIV medical and case-management providers are instrumental in supporting the intervention and reinforcing the importance of using PositiveLinks. The care-site provider's responsibilities include:
 - Assisting in goal setting and tracking;
 - Supporting the PLC to identify and refer potential clients; and
 - Generally supporting clients to make the best use of the intervention to improve their outcomes.
- *Mobile Developer or Care-Site IT Security Stakeholders*: Each care-site team must include or consult with its IT security staff to ensure that the intervention complies with institutional regulations. Care-site IT teams may be required to integrate the EMR system with the PositiveLinks app. Early on, it will be helpful to identify an IT member or team who can provide ongoing technical support and assistance during the review and approval process.
- *Program Evaluator (optional)*: The program evaluator provides oversight of evaluation support, including data management and data analysis.

Staff Characteristics

Core competencies of all staff should include:

- Familiarity with the care site's referral processes;
- Familiarity with smartphone devices and smartphone apps;
- Flexibility and patience;
- Ability to creatively problem-solve;
- A genuine interest in the well-being of people with HIV;
- Cultural responsiveness and comfort with diverse populations and lifestyles;
- A growth mindset;
- Excellent time management and organizational skills; and
- Familiarity with the principles of SBCM, MI, and holistic engagement into care.



Adaptation

If designating or hiring an evaluator is not feasible, this task may be included in another staff member's role (e.g., the PLC).

Replication Tips for Intervention Procedures and Client Engagement

Successful replication of the PositiveLinks intervention involves the following:

- Participation in PositiveLinks Staff Training Program.* This training program is provided by the PositiveLinks Team at UVA Health (Table 1). Training sessions may be conducted in person or online using a method that can deliver video-based, face-to-face, synchronous training. The initial training session is augmented by a certification program for all staff who will support PositiveLinks clients. The certification program offers online modules based on staff roles. The online learning modules should be available throughout the implementation process to ensure that all staff have demonstrated proficiency in using the PositiveLinks app and portal.
- Promote the Intervention.* Marketing materials such as the brochure UVA Health developed can help disseminate information about PositiveLinks and encourage clients to enroll. (See Additional Resources Box). These materials should be available within the clinic and at partner organizations where appropriate. Marketing and dissemination of PositiveLinks materials should be informative, empowering, and reflective of the diverse communities you serve.

Table 1 — Recommended PositiveLinks Staff Training

In-Person Course Name	Content Description	Who Should Attend	Who Will Teach
Introduction to PositiveLinks	PositiveLinks development, features, intended use, and impact	PositiveLinks site care team	PositiveLinks team
PositiveLinks Member Enrollment and App Training	Member enrollment and app training best practices	Partner/site manager, PLC, site providers	PositiveLinks team
PositiveLinks Administrator Portal	Portal content curation, member and cohort monitoring, and reporting tools	Partner/site manager, PLC	PositiveLinks team
PositiveLinks Member Engagement and Retention Strategies	Best practices for promoting and retaining member engagement with PositiveLinks	Partner/site manager, PLC	PositiveLinks team
PositiveLinks Phone and Phone Credit Procurement and Management Practices	Portal tools and best practices for procuring prepaid devices and phone credits	Partner/site manager, PLC	PositiveLinks team

Source: University of Virginia School of Medicine. (n.d.) PositiveLinks Implementation Manual and Workbook (See Additional Resources Box).

Securing Buy-In

Securing the support of leadership, staff, and other relevant stakeholders is an important step when implementing a novel intervention. The following strategies may help to secure buy-in for the PositiveLinks intervention:

- **Prioritize stakeholder input at the client, operational, and leadership levels:** Gather feedback from clients and staff to assess buy-in, identify champions, discuss organizational priorities, gauge the potential client base, and address any questions or concerns that arise.
- **Highlight the importance of warm technology:** Stress how this technology helps to efficiently and sustainably build interpersonal relationships between site providers and clients.
- **Emphasize that PositiveLinks extends provider reach:** Underscore how the technology helps providers interact with clients in meaningful and efficient ways and helps to extend SBCM to a population that has not been retained in care for a variety of reasons, including geographic and resource-related factors.
- **Discuss the technical assistance available to PositiveLinks platform users:** Explain that a comprehensive orientation accompanies the PositiveLinks app and that the UVA Health team is hoping to develop a community of practice through the intervention. Emphasize that these activities either enhance and extend existing strategies or are aspirational within your organization.



Overcoming Implementation Challenges

The PositiveLinks intervention is multifaceted, and implementation can be complex. Anticipated challenges, as well as possible solutions, include:

- **Obtaining IT Approvals:** Prepare relevant documentation and collaborate with in-house staff to obtain IT security review and approval. Have open conversations to determine how nimble your organization can be in adopting new technology and integrating it into the workflow. Initial approvals may take longer than anticipated, making it crucial to maintain open lines of communication with organizational leadership to facilitate the process and create realistic timelines.
- **Obtaining Provider Buy-In:** Develop and strengthen relationships with providers. Clinicians, medical doctors, and nurses have significant workloads. A conversation about the value that the PositiveLinks app adds for them is necessary to address concerns (e.g., potential risks, protocols for clients who show psychological distress, completion of required documentation) that providers may have.
- **Public Health Crises:** Consider the broader healthcare landscape. Public health crises such as COVID-19 may impact your site's ability to deliver care to clients by reducing non-essential client contact. When in-person visits are not feasible, operationalize remote client enrollment and support.
- **Funding a mHealth Intervention:** Identify funding opportunities to support technological resources. Technology-based interventions can be costly, depending on the resources that need to be purchased and maintained, such as smartphones and data plans. However, these resources are key to enabling clients to overcome social and structural barriers to health. Work with internal teams to find funding, especially amid the growing recognition among federal funders of the potential need to support phones and related costs.
- **Sharing Challenges and Solutions with All PositiveLinks Platform Users:** Provide ongoing technical assistance. In addition to gathering feedback and responding to issues as they arise, the PLC can provide updated resources to teams and standardize solutions where appropriate to better support the care site. Potential challenges and solutions can be summarized in a document that includes knowledge and tips from staff. This collaborative exchange of knowledge enables the intervention to nurture a community of practice that empowers the broader PositiveLinks community. Teams can also designate staff members who will directly coordinate or manage the intervention. Other staff can focus on program implementation and troubleshoot problems. By facilitating regular communication with support teams and anticipating potential barriers, you will be able to resolve most issues that could threaten the intervention's success.

“It is important for care sites that are implementing PositiveLinks to know that there is ongoing technical assistance that’s available. It’s not a piece of software or code that we give to them, and we walk away, but there is a community of practice that we’re developing.”


– SENIOR IMPLEMENTATION SPECIALIST

Adaptation of the Original Intervention

While PositiveLinks continues to include core components of the original intervention, UVA Health has added features based on clients’ and providers’ feedback. It has also adapted the app for Spanish-speaking clients (Table 2). Organizations that work in different environments or with larger populations or have varying needs may choose to offer one message board or multiple tailored message boards (e.g., a dedicated message board for youth). The Spanish-language app, called *ConexionesPositivas*, also allows NovaSalud, a local CBO that serves predominantly Latinx populations in Northern Virginia, to provide clients with an additional resource to improve retention.

The Virginia Department of Health supports organizations that receive RWHP Part B funding to implement PositiveLinks. The PositiveLinks team at UVA Health has collaborated with CBOs in Virginia to adapt PositiveLinks to fit the context of other care sites and has continued to follow them. A research consultant at UVA oversees implementation evaluation across different sites and reaches out to key stakeholders to discuss barriers and implementation facilitators. This allows the UVA Health PositiveLinks Team to update processes and the app as needed, stay relevant and responsive to client needs, and continue serving as a model for future organizations.

Table 2 — Adaptation of the PositiveLinks Intervention



Original Model	Adaptation	Rationale
<p>Core components included medication adherence, self-monitoring, and social support</p> <p>English only</p>	<p>Addition of HIPAA-compliant telemedicine</p> <p>Adjustments to the user and community board interfaces, how clients receive self-monitoring queries, and how they view their lab results</p> <p>Development of a Spanish-language app, <i>ConexionesPositivas</i>, with an additional message board for Spanish speakers</p>	<p>HIPAA-compliance ensures the delivery of confidential, secure telehealth services.</p> <p>Adjustments to the interfaces allow clients to tailor the intervention to their preferences.</p> <p><i>ConexionesPositivas</i> increases reach to Spanish-speaking populations.</p>

Promoting Sustainability

To ensure the long-term sustainability of PositiveLinks, consider taking a multipronged approach:

- *Communicate with Stakeholders and Clients:* Proactively share updates and seek ongoing feedback from providers, clinic staff, and clients through focus groups, client advisory boards, surveys, newsletters, and the app itself. This offers the community multiple avenues to provide input and helps your organization determine changes that may be needed. Moreover, this input allows care sites to revisit their organizational priorities and assess the extent to which PositiveLinks is advancing them.
- *Update App Content:* To maximize impact on client engagement and health outcomes, ensure that the platform's resources and announcements are updated and continue to be relevant to clients. For example, the community message board is a space where PositiveLinks staff can add information about care-site activities and broader events in the community over time.
- *Secure Funding:* Collaborating with public health authorities, including health departments, is key to securing future grants to cover the administrative and technological costs of the intervention. Work with your state's department of public health and HIV care leadership to ensure that the intervention supports state goals. Highlighting the impact of PositiveLinks on retention, viral suppression, and overall health outcomes may help you negotiate additional financial support. Different funding sources can help sustain the intervention, including state funds, ADAP rebate dollars, and partnering with your state on its *Ending the HIV Epidemic* plans. Research funding may also allow your care site to support the intervention, particularly if your organization cannot access funding through a local or state health department.
- *Broaden Reach:* The flexibility of PositiveLinks lends itself to adaptation by care sites across the country. Another possible strategy for securing sustainability is to research ways of disseminating information about the intervention to other organizations and health systems. This would help put PositiveLinks on the state and national "radar" as an example of an innovative and effective intervention for people with HIV.



SWOT Analysis

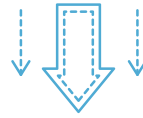
SWOT is an acronym for Strengths, Weaknesses, Opportunities, and Threats. A SWOT analysis is a structured planning method that can assess the viability of a project or intervention. By conducting a SWOT analysis before an intervention, organizations can proactively identify challenges before they occur and think through how to best leverage their organizational strengths and opportunities to improve future performance. A SWOT analysis of the PositiveLinks intervention at UVA Health identified the following:



STRENGTHS

The intervention will increase relinkage and retention outcomes for clients who are out of care by:

- Establishing common goal(s) for the project,
- Enhancing existing relinkage efforts,
- Employing motivated staff, including a PLC who has a consistent clinic presence,
- Communicating through different channels with clients who have significant barriers to care,
- Identifying priority population(s) from the outset to facilitate recruitment and implementation,
- Presenting clients with tiered educational opportunities, and
- Nourishing creative thinking about ways to overcome barriers to health care access in rural populations.



WEAKNESSES

Agencies will find it challenging to implement the PositiveLinks intervention without:

- Leadership to promote the intervention,
- Discussing how activities to implement the app can be integrated into the organization's infrastructure,
- Determining the organization's willingness to embrace novel approaches to care,
- Procuring resources to provide clients with smartphones and data plans,
- Hiring a full-time PLC,
- Creating a client portal or EMR access points for client-provider communication,
- Addressing concerns about security at the client, clinic, and institutional level,
- Understanding broadband access (e.g., wifi, cellular data services),
- Identifying billable services (e.g., client correspondence with providers through the app),
- Establishing policies and procedures for phone repairs and replacement, and
- Providing sufficient training for both clients and staff on the app and other aspects of the intervention.



OPPORTUNITIES

The PositiveLinks intervention offers opportunities to:

- Offer a protected platform developed with and for people with HIV to overcome barriers to accessing HIV care,
- Expand the reach of support services,
- Allow clients to tailor features of the intervention based on their needs and interests,
- Disseminate important information to clients,
- Observe changes in client patterns daily,
- Securely transfer data between the app and the client's EMR,
- Integrate telemedicine efforts,
- Address stigma by facilitating client-provider relationship building and connecting clients to the broader community of people with HIV,
- Build trust and confidence in the system through client-centered care,
- Ensure timely and efficient messaging at the clinic,
- Assist clients with engaging in their own time,
- Provide safe and secure messaging between clients and their providers, and
- Enhance technology literacy among both clients and staff.



THREATS

Threats to the success of the PositiveLinks intervention include:

- Changes in funding availability,
- Changes in organizational priorities,
- Shifts in the public health landscape that may push organizations to pursue alternative ways of enrolling and supporting clients, and
- Lack of a point person(s) to address IT issues as they arise.

Conclusion

Evidence-based mobile health interventions such as PositiveLinks are integral to ensuring that people with HIV are engaged and retained in care. Organizations are uniquely positioned to consider adopting PositiveLinks, given the changing healthcare technology landscape and the need in the public health field for innovative, accessible interventions. The PositiveLinks platform, a clinic- or CBO–deployed smartphone app and the online portal, can enhance engagement at care sites by realizing broader organizational goals and providing health and social support to people with HIV in a holistic way beyond the clinical setting. In addition to closing health care gaps, the intervention further aims to connect clients to a virtual local community.

The components that make PositiveLinks effective include the capacity to self-monitor medication, mood, stress level, and care coordination. The community message board allows participants to connect with peers with HIV who provide psychosocial support, advice, and encouragement.¹⁶ The app enhances clients’ relationships with their care providers and virtual community, which has proved to be a sustainable strategy to retain clients in care. For providers, the PositiveLinks portal provides a complete and convenient visual snapshot of a client’s status between care-site visits. In addition to delivering real-time, actionable data such as check-in response rates, self-reported medication adherence, CD4 counts and viral load, mood, stress levels, achievements, and upcoming appointments, PositiveLinks also provides resources for people with HIV who are new to care or at risk of falling out of care.

The implementation of PositiveLinks was evaluated in a pilot study that used a single-arm prospective design with 6-month and 12-month assessments. Results showed improved retention in care, visit constancy rates, CD4 counts, and viral suppression (Table 3).¹ Participant interviews and qualitative analysis of the app’s community message board found that the app provided users with a sense of connection and social support.¹

Table 3 — PositiveLinks Pilot Study: Summary of Findings¹

	Baseline	6 Months Post-Implementation	12 Months Post-Implementation
Retention in care	51%	88% (P<0.0001)	81% (P=0.0003)
Visit constancy	22%	36% (P=0.016)	51% (P=0.0004)
Viral suppression	47%	87% (P<0.0001)	79% (P=0.0007)

Additional Resources

PositiveLinks Website

PLvirginia.org

Ryan White HIV/AIDS Program Fact Sheet

hab.hrsa.gov/sites/default/files/hab/Publications/factsheets/program-factsheet-program-overview.pdf

Ryan White HIV/AIDS Program Services: Eligible Individuals & Allowable Uses of Funds Policy Clarification Notice 16-02

hab.hrsa.gov/sites/default/files/hab/program-grants-management/ServiceCategoryPCN_16-02Final.pdf

CIE Cost Analysis Calculator

CIEhealth.org/innovations

PositiveLinks Budget Worksheet

CIEhealth.org/intervention/positive-links#resources (Click on Resources)

PositiveLinks Coordinator Job Description

CIEhealth.org/intervention/positive-links#resources (Click on Resources)

PositiveLinks Decision Task Checklist

CIEhealth.org/intervention/positive-links#resources (Click on Resources)

PositiveLinks Pre-Implementation Reflection

CIEhealth.org/intervention/positive-links#resources (Click on Resources)

PositiveLinks Site Readiness Checklists

CIEhealth.org/intervention/positive-links#resources (Click on Resources)

PositiveLinks Implementation Manual and Workbook

CIEhealth.org/intervention/positive-links#resources (Click on Resources)

ARTAS Resources

<https://www.cdc.gov/hiv/effective-interventions/treat/artas?Sort=Title%3A%3Aasc>

PositiveLinks Brochure

CIEhealth.org/intervention/positive-links#resources (Click on Resources)

PositiveLinks Challenges and Solutions

CIEhealth.org/intervention/positive-links#resources (Click on Resources)

PositiveLinks Frequently Used Terms

CIEhealth.org/intervention/positive-links#resources (Click on Resources)

The Cost and Threshold Analysis of Retention in Care (RiC): A Multi-Site National HIV Care Program

https://www.researchgate.net/publication/310666696_The_Cost_and_Threshold_Analysis_of_Retention_in_Care_RiC_A_Multi-Site_National_HIV_Care_Program

Endnotes

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