



**EMERGENCY DEPARTMENT AND
HOSPITAL-BASED DATA EXCHANGE
FOR REAL-TIME DATA TO CARE
INTERVENTION**



Center for
Innovation and
Engagement

Background

The Health Resources and Services Administration's (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 RWHAP funds states, cities, counties, and local community-based organizations to provide care and treatment services to people with HIV to improve health outcomes and reduce HIV transmission among hard-to-reach populations.

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Acknowledgements

NASTAD Authors:

Alexander Perez, Manager, Health Equity
Bishar Jenkins, Fellow, Health Equity
Rosy Galván, Director, Health Equity

Intervention Development Team:

Julie Dombrowski, Infectious Disease Specialist
Tigran Avoundjian, Research Assistant

Contributors









Natalie Cramer, Senior Director, NASTAD
Tara Kovach, Impact Marketing + Communications
Sarah Cook-Raymond, Impact Marketing + Communications

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Stock photos. Posed by models.

Intervention Snapshot

	Priority Population	General Population
	Setting	Emergency Department (ED). However, this intervention may be adapted to fit the needs of your healthcare setting.
	Pilot and Trial Sites	University of Washington Medical System, Harborview Medical Center (HMC), and the University of Washington Medical Center in partnership with Public Health—Seattle and King County (PHSKC).
	Model	The intervention consists of a real-time data exchange system activated when people with HIV with a detectable viral load (>200 copies/mL) present to Emergency Departments. The data exchange system cross-evaluates client data with public health department data to begin re-engaging clients into care.
	RWHAP Ending the Epidemic (EHE) Opportunity	People with HIV and lower CD4 counts disproportionately access EDs for medical care due to insurance status, comorbid conditions including substance use disorder or housing insecurity, and changes in their health status. Intervention outcomes indicate that clients that present to the ED during the alert window are 1.50 times more likely to reach viral suppression within six months.
	Intervention Funding	RWHAP Part A and Part C funds were used to support linkage activities within the medical center complex. Data exchange development and evaluation of the intervention was funded by the University of Washington's Institute of Translational Health Sciences. Facilities and resources were provided by the Harborview Medical Center, University of Washington Medical Center, and Northwest Hospital & Medical Center.
	Staffing	Staff positions in the original intervention include HIV Re-Linkage Specialist (or Disease Intervention Specialist), Database System Team, Data Manager, and Administrative Coordinator.
	Infrastructure Needed	Electronic health records with the capacity to generate an alert Software (e.g., SQL Server Integration Services) to build the data exchange system Re-linkage team



Intervention Overview & Replication Tips

Why This Intervention?

The goal of the Emergency Department and Hospital-Based Data Exchange for Real-Time Data to Care (ED Alert) intervention is to re-engage people with HIV to care and to improve viral suppression rates. This is achieved by utilizing a real-time data exchange system that connects clients with health department linkage specialists when presenting to the emergency department (ED). The outcomes of this intervention yielded considerable success in increasing the frequency of visits to providers in the three months post-intervention, consistent viral load (VL) testing, and the attainment of viral suppression over a six-month period following a provider visit in the post-intervention period. The University of Washington Medical Center partnered with Public Health—Seattle & King County (PHSKC) in Washington to create a real-time data exchange system that is activated when people with HIV with a detectable viral load (>200 copies/mL) present to the ED at hospitals within PHSKC. The data exchange system cross-evaluates client data with public health department data to begin the process of re-engaging these clients into care.¹






Outcomes of the intervention indicate that clients who present to the ED during the Monday–Friday 8:00 am–6:00 pm alert window are 1.50 times more likely (95 percent CI: 1.27–1.76) to reach viral suppression within six months than clients in the pre-intervention period. While the study demonstrates that care engagement and viral suppression rates post-intervention were similar to that of clients who presented to the ED outside of the alert window, it is important to highlight the efficacy of deploying real-time data exchange systems as a vehicle for clients to achieve key clinical markers, such as viral suppression.




This intervention is best applied to an existing data exchange system of relinking people with HIV to care. A program evaluator from the partnering health department stated,

“This intervention cannot be the only tool in your toolbox. It’s a part of a bigger system of how we identify people who are out of care and how we do [effective] outreach.”

Intervention at a Glance

This section provides a breakdown of the ED Alert intervention. The intervention is intended to re-engage people with HIV to care when they present to an ED using a real-time data system.

 <p>Step 1</p>	<p>Characterize Your Health Data:</p> <p>Implementing a data exchange intervention requires a clear characterization of the data elements available through the health system in your jurisdiction. This means having a well-defined picture of available client data, reporting frequency, data sources, variables of interest for the data exchange, existing data-sharing agreements, and the type of software needed to support data exchange activities.</p>
 <p>Step 2</p>	<p>Stakeholder Buy-In:</p> <p>The implementation of this intervention requires approvals between partnering organizations to ensure the safeguarding of client data. This includes the establishment of data sharing agreements, standard operating procedures, and privacy protocols. Since this intervention is applied within the clinical ED setting, obtain support from nursing staff to ensure that re-linkage efforts can coincide with the ED care that staff are providing to clients. Gauge organizational capacity to hire the necessary staff to implement the intervention and ensure support from clinical staff.</p>
 <p>Step 3</p>	<p>Assess and Address Gaps in Staffing and Workflow:</p> <p>The role of re-linkage specialists (disease intervention specialists and health department HIV re-linkage specialists) and reliable Information Technology (IT) administrators are critical to implementing this intervention. Ensure that you have staff members who can oversee the development of the data exchange system and there is sufficient buy-in from the in-house IT department to help facilitate the development of the system. IT staff should be familiar with the health data infrastructure in your jurisdiction and be available to assist with technical issues as they arise.</p>
 <p>Step 4</p>	<p>Setup the Data Exchange:</p> <p>The goal of the intervention is to use a real-time data exchange system that gathers available health system data (e.g., electronic medical records) to determine whether a client who presents to the ED has a previous positive HIV laboratory test and a viral load of >200 copies/mL. An automated alert is then developed that notify health department HIV re-linkage teams. Ensure that you can identify people who are not virally suppressed or have not received a viral load test within a three- to six-month period and reliably extract this data to develop an alert system.</p>
 <p>Step 5</p>	<p>Develop the Alert:</p> <p>Understand the characteristics of your client population to determine what metrics are critical to include in the alert algorithm. There is some flexibility in how to approach this aspect of the intervention. Determine the most consistent barriers for care engagement within your population base and develop an electronic medical alert system around clinical outcomes most affected by those barriers. Determine an alert window (e.g., 8:00 am–5:00 pm Monday–Friday) that will maximize your opportunity to relink clients to care and that aligns with your staffing capacity.</p>

 <p>Step 6</p>	<p>If Needed, Recruit a Re-linkage Team:</p> <p>If an existing re-linkage team or specialist, such as a disease intervention specialist (DIS), is not already in place, prioritize the hiring of health department linkage specialists who will comprise the re-linkage team. This team will begin re-linkage to care once an alert is received through the data exchange system. While this intervention was not created to serve a specific population, it is important that the re-linkage team is representative or shares the lived experiences of the population(s) served to ensure the intervention’s success.</p>
 <p>Step 7</p>	<p>Train ED and Re-linkage Staff:</p> <p>Staff training necessitates an understanding of the data exchange system and how alerts are triggered, and how to engage clients with various lived experiences. It is important that staff are trained in trauma-informed approaches as ED visits can occur due to both medical and circumstantial client experiences.</p>
 <p>Step 8</p>	<p>Re-engage and Retain People with HIV:</p> <p>Implement the intervention to re-engage people with HIV into care and facilitate the attainment of viral suppression within a specific time interval after care re-engagement.</p>

Cost Analysis

Data exchange development and evaluation of the ED Alert intervention was supported by funding from the University of Washington’s Institute of Translational Health Sciences’ TL1 Training Grant (#5 TL1 TR002318-02) and the facilities and resources from the Harborview Medical Center, University of Washington Medical Center, and Northwest Hospital & Medical Center. Within the medical center complex, RWHAP Part A and Part C funds were available and primarily used to support linkage activities. HRSA’s RWHAP Program Fact Sheet provides more context on the different funding Parts. Additionally, RWHAP’s Policy Clarification Notice 16-02: Eligible Individuals and Allowable Uses of Funds, outlines details on allowable costs. ([See Additional Resources Box](#)).

A comprehensive cost analysis for this intervention was not available when this manual was developed. However, you can use the CIE Cost Calculator to create an estimate for implementing the intervention at your organization. ([See Additional Resources Box](#)). Replicators are encouraged to utilize the Logic Model provided to inform the input parameters needed to determine intervention costs.

Resources Assessment Checklist

Before implementing the ED Alert intervention, your organization should walk through the following Resources Assessment (or Readiness) Checklist to assess your capacity to do this work. If you do not have these components in place, you are encouraged to develop this capacity to conduct the intervention successfully. Questions to consider include the following:

- Is an existing system to relink people with HIV to care available within your healthcare setting or partnering health department?
- Does your organization have staff available with experience in SQL servers or similar software to establish alert criteria and to build the data exchange system?
- Does your organization or local health department have access to HIV surveillance data?
- If your organization is not directly affiliated with the health department, is there an established rapport between your organization and the local health department?
- Do you have an established connection with an HIV care clinic if one is not already embedded in your organization?
- Do you have the resources to hire a program evaluator that will oversee ongoing monitoring and evaluation of client outcomes?
- Are there allocated funds within the public health department, or other sources to support implementing this intervention (e.g., RWHAP funds, CDC funds, special funding categories, etc.)?
- In your existing re-linkage efforts, are there mechanisms in place to connect persons to care outside of the 9 am–6 pm weekday schedule? If not, would it be feasible for your organization to establish after-hours clinic services?
- Is there a staff person who can solely focus on championing the program and amplifying the project's goals to external stakeholders?

Setting the Stage

According to the U.S. Centers for Disease Control and Prevention (CDC), there are an estimated 1.2 million people with HIV in the United States. 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.² 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.³ While significant strides have been made in ensuring people with HIV effectively progress through the HIV care continuum (see [Additional Resources Box](#)), these figures demonstrate that retention continues to be a critical issue. A detectable viral load and lower CD4 counts are associated with increased morbidity and mortality. Subsequently, these clients may experience changes in their health status that would necessitate an ED visit. Emergency room visits are an opportune setting to re-engage people with HIV into care, especially as there is also evidence that people with HIV disproportionately access the ED for medical care due to insurance status and comorbid conditions, including substance use disorder or housing insecurity.⁴

The ED Alert intervention uses an innovative, real-time data exchange system. The intervention was designed as a partnership between the University of Washington Medical System, Harborview Medical Center (HMC), and the University of Washington Medical Center. The Madison Clinic, based at Harborview Medical Center, is the largest RWHAP-funded HIV specialty clinic in Washington State and provides care to approximately 2,800 people with HIV. Public Health—Seattle and King County (PHSKC) real-time data exchange scans the UW Medicine Enterprise Data Warehouse (EDW) every five minutes to identify clients presenting in the ED and inpatient (IP) units. Alert-eligible visits were defined as visits for clients who (1) were in the hospital on a weekday between 8:00 am–6:00 pm; (2) had any previous positive HIV laboratory tests; and (3) had a last recorded viral load that exceeded 200 copies/mL prior to their visit. If a client is eligible, the data exchange



sends a short messaging system (SMS) notification to the PHSKC HIV care re-linkage team to facilitate linkage to care. The re-linkage team receives client information using a SQL Server Reporting Services (SSRS) report, which is available through the UW Medicine network and updated in real time. The re-linkage team reviews the SSRS report as soon as possible after receiving an SMS alert, typically within a few hours. Client information remains on the report until the client is discharged. After reviewing the alert and client information, the re-linkage team contacts the nurse caring for the client to check on the client's health status, and, when possible, meets with the client while they are in the ED or hospital to discuss HIV care re-engagement, identifies barriers to care, assists with making a follow-up appointment, and links the client to supportive services.

The re-linkage team maintained a brief Excel spreadsheet with information about client interactions, but they did not systematically track alerts. During the evaluation period, the data exchange sent SMS notifications only for clients registered in the ED or admitted to the hospital between 8:00 am–6:00 pm Monday through Friday. However, the data exchange collected data for clients presenting to the ED or IP during

after-hours or weekends. These data remained in the database for three days after the prompting of the initial alert. The data were collected to make an extra effort to contact clients who presented outside of the normal hours and did not have the opportunity to connect with the re-linkage team. After July 2017 (post-evaluation period), the ED added a database of Madison clinic clients and began cross-referencing clients on a surveillance-based data to care list within the UW Medicine list. “No VL test in the past 12 months” was added as an additional alert-eligible parameter. The creation of this database helped prioritize clients who experienced multiple barriers to re-engagement in care. These barriers included housing insecurity, lack of consistent and reliable transportation, and navigating comorbid conditions.

A pre-/post-design was used to evaluate the impact of real-time data exchange. The post-intervention period was defined as the two years after the data exchange was implemented. The pre-intervention period was defined as the two years before the data exchange was implemented, with a six-month washout period. An intent-to-treat approach was used in the evaluation design (i.e., effects were estimates on the whole of HIV care outcomes among populations of unsuppressed people with HIV with an ED visit or IP admission regardless of contact with the

re-linkage team). UW Medicine Enterprise Data Warehouse client data were linked to PHSKC’s electronic HIV/AIDS reporting system (eHARS) using a probabilistic matching algorithm (fastLink). Information was matched using first and last name, gender, race, ethnicity, date of birth, and social security number. The intervention manually matched clients with an alert-eligible visit in the EDW who did not have a match in eHARS using fastLink (N = 27). After manual review, all clients with an alert-eligible visit had a matching record in eHARS. The program evaluator also manually reviewed all matches identified by the matching algorithm for false matches. No false matches were identified.

Overall, 90 percent of alert-eligible visits occurred at HMC. In the post-intervention period, clients were 1.08 times (95 percent CI: 0.97, 1.20) more likely to reach viral load test after an ED visit/IP admission than clients in the pre-intervention period. Clients were 1.50 times (95 percent CI: 1.27, 1.76) more likely to reach viral suppression in the six months after an eligible visit in the post-intervention period compared to clients in the pre-intervention period. Viral load testing after an ED visit or IP admission increased among clients with visits in and outside of the alert window, and there was no significant difference-in-difference (DID) in these increases (DID: 1.00, 95 percent CI: 0.84,



1.18). Similarly, there was no DID in the increase in viral suppression within six months between clients in both groups (DID: 1.01; 95 percent CI: 0.84, 1.20). Overall, clients with ED visits or IP admissions in the post-intervention period were 50 percent more likely to reach viral suppression in the six months after their visit compared to clients in the pre-intervention period. It is important to note that the differences identified here may be attributed to secular trends based on comparisons with client data for those admitted outside of the alert window.

The program evaluator reiterated that the intervention's success was due to a larger ecosystem between the UW Medicine System, UW Medical Center, and Public Health—Seattle & King County, which was supportive of efforts to re-engage people with HIV to care. The program evaluator highlights that it is important to understand individual clients' lived experiences and determine re-engagement success based on a qualitative, contextual understanding of their barriers as opposed to metrics such as re-engagement after three or six months. For example, 39 percent of clients who presented to the ED or IP unit during the alert window reported a lifetime usage of substance use, prompting the re-linkage team to apply a harm reductionist approach in their re-engagement efforts to support clients by meeting their holistic needs.

Cross-evaluating ED and IP hospitalization data with HIV surveillance may be a promising strategy to prioritize data to care investigations to serve vulnerable populations that are most in need of re-engagement assistance.¹ This clinical encounter provides an opportunity for health department staff conducting HIV care re-engagement work to engage clients who may be difficult to contact due to housing insecurity or inconsistent telephone numbers. This intervention integrates HIV surveillance data with ED and IP data in real time to improve the efficiency and quality of HIV data to care interventions.¹



Description of the Intervention Model

The ED Alert intervention uses a real-time data exchange system to identify clients who are out of care and whose last recorded viral load exceeds 200 copies/mL and connect them with linkage specialists while in the ED. Implementing this intervention ensures that clients who are not in HIV care can successfully re-engage in care and reach viral suppression, thereby improving health outcomes. The implementers of this intervention utilized a mixture of research funding to evaluate the intervention described here but leveraged RWHAP Part A and Part C funding to support activities related to service linkage. RWHAP Part A funding can be useful to potential replicators for activities related to core medical services (e.g., the AIDS Drug Assistance Program), treatments, early intervention services, mental health services, substance use disorder outpatient care, etc.) and supportive services (e.g., medical transportation, food banks, housing, psychosocial support, etc.). These can also be supplementally supported by RWHAP Part C funding should your organization be eligible to receive those funds. The intervention can be divided into four overarching phases:

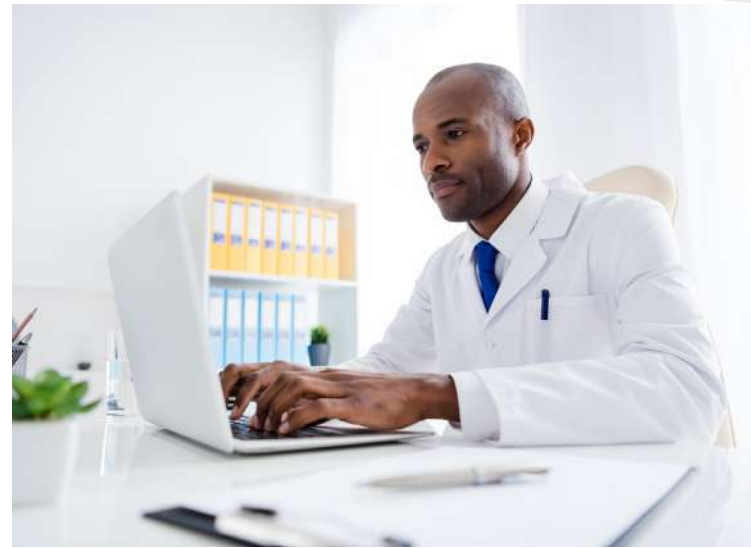
1. Characterize Your Health Data System and Secure Buy-In

- a. *Understand the Collaborative Health System's Data Structure:* Familiarize yourself with the data structure of electronic health records (EHRs) to understand how to extract key data about clients who activate the alert system and assess how often the exchange system will run. Identify a specific software (e.g., SQL Server Integration Services) to build the data exchange system and make the data accessible for the disease intervention specialists through automated reports.
- b. *Evaluate Data Use Agreements:* The ED alert system was created through a partnership between the UW Medical System and Public Health—Seattle & King County. Replicating this intervention requires negotiating data use agreements between the jurisdictional health department and the healthcare system to ensure that the health department can collect client data from the healthcare system when a client presents to the ED. Establishing a data-sharing agreement includes identifying



potential security issues, creating a data-sharing protocol, and determining data transfer methods, among other things. NASTAD offers data-sharing agreement templates and guidance that may help you establish an agreement with your local health department if one is not already in place. ([See Additional Resources Box](#)).

- c. *Secure Buy-In:* The success of implementing this intervention necessitates leadership buy-in. Partnerships of this magnitude require approvals between each institution to develop the data matching process and to ensure the safeguarding of client data to reduce liability between participating institutions. Identify an agency champion who can coordinate care team members to identify and address client alerts and mediate discussions between IT personnel and the re-linkage team. Appoint a dedicated IT point of contact to address system issues as they arise and ensure ongoing technical assistance where needed. Involve leadership and staff in brainstorming ways to ensure meaningful engagement of people with HIV through focus groups, one-on-one conversations, and meetings with community advisory boards if possible.
- d. *Identify or Recruit Staff Where Appropriate:* Ensure there is a dedicated re-linkage team or individual available to engage with clients in real time once an alert is received. The PHSKC team repurposed their existing health department disease intervention specialists to work on this intervention specifically, but in cases where this is not possible, recruit a DIS or re-linkage specialist for this role. All re-linkage team members should be familiar with motivational interviewing strategies, Anti-Retroviral Treatment and Access to Services (ARTAS) strategies, and harm reduction approaches to ensure effective engagement with clients. ([See Additional Resources Box](#)). It is important to note that implementing this intervention in Seattle allowed for quick re-engagement due to the proximity of the health department HIV re-linkage team to the Harborview ED. Coordinating the location of your re-linkage team based on your unique needs will be an essential consideration in identifying or recruiting members of your



team. You may also consider a dedicated administrative coordinator tasked with liaising between relevant parties involved in the delivery of the intervention (e.g., ED staff, IT staff, HD staff, etc.) as a way of reducing the burden for those engaged in direct service. A data manager may also be a useful addition to help monitor ED alerts, manage novel HIV program data, and work on data structure issues that may be out of reach for IT staff.

2. Build the Alert Tool and Operationalize its Use:

- a. *Build the Alert Tool and Determine Usage:* The UW Medical Center designed an alert tool to activate the disease intervention specialists to begin the process of re-linkage to care. Prioritize a collaborative approach to ensure that the health department receives important clinical data with alert reports and to determine how frequently alerts will be sent from the medical center. It is important to establish alert system criteria by prioritizing persons who are out of care and have a detectable viral load (>200 copies/mL) or other eligibility criteria determined by federal or state regulations.
- b. *Activate Disease Intervention Specialists:* PHSKC established guidelines with their disease intervention specialists to identify how to respond to alerts. The original intervention re-linkage team at PHSKC manually reviewed

surveillance data each time an alert was received to ensure the client in question was truly out of care. Your relationship with the health department or surveillance unit may differ, so ensure that an appropriate process is in place to match alert data with surveillance data as needed. Consider pursuing a flexible and adaptable approach to re-linkage efforts since each client is unique, and their lived experiences inform their ability to remain engaged in care. Rather than applying a prescriptive approach, allow the re-linkage team to use discretion and leverage each client's strengths to navigate re-linkage on a case-by-case basis.

3. Integrate the Data Exchange System into the Existing Re-linkage Infrastructure:

- a. *Train ED Staff and the Re-linkage Team on Alert Processes:* Integrating a novel data exchange and alert system requires that all relevant staff are trained on the intervention process, including providers, re-linkage specialists, and other individuals with additional roles (e.g., data managers, administrative staff, etc.). This should include knowing the characteristics of clients who would trigger an alert, knowing what staff need to be reached when a client needs re-engagement services, knowing when a client cannot reasonably be engaged in care (e.g., restrictive autonomous capacity), understanding the referral process, and any other necessary procedures relevant to your clinic infrastructure. Establish a procedure to train new staff if there is turnover. Leverage your agency champion or administrative coordinator to check in with the different teams to ensure a streamlined workflow. If re-linkage staff are not trained in motivational interviewing, ARTAS, or harm reduction strategies, take the time to make sure they are certified before engaging with clients.
- b. *Incorporate Additional Alert Criteria Responsive to Client Needs:* Engage clients whose multiple marginalized lived experiences converge into concrete barriers for continued engagement in HIV care.⁵ After designing and utilizing the new data exchange system, integrate additional criteria into the alert

system algorithm to include anyone who has previously been seen at your clinic as a way of triaging clients experiencing the most barriers to care.

4. Conduct Real-Time Re-linkage Efforts:

- a. *Apply the Re-linkage to Care Model:* Upon receiving an alert from the data exchange system, the re-linkage team arrives at the ED to begin the process of relinking a client to care. Identify the head nurse in charge during that shift to determine if the client's medical status is stabilized and if it is feasible to speak with the client.
- b. *Build Rapport with Clients and Identify Their Needs:* Understanding clients' lived experiences and affirming these experiences and their identities are the foundation for building rapport. This is an important component of re-linkage efforts, as sometimes the cause of people being out of care is not having opportunities to have holistic clinical experiences or address the potential barriers they face. Microaggressions (e.g., trans-exclusionary clinical practice, provider bias, and stigma towards substance use) can also impede engagement in care and treatment adherence. After rapport is established, triage client needs and refer to appropriate services inside or outside your clinic.
- c. *Follow up with Clients After Their ED Visit:* Conduct additional outreach with clients' HIV providers or other agencies' clients when referred. Assess persistent barriers to care engagement and provide additional services when needed. Evaluate clinical metrics (e.g., viral load, CD4 count) after follow-up with providers.
- d. *Reach Clients who Present to the ED Outside of the Alert Window:* After developing the data exchange system, transmit client alerts after-hours and keep them on the alert list for three days. Follow up with the care provider and the client if the client is discharged from the hospital. Flag medical record identifications for clients who present outside of the alert window to ensure the re-linkage team can act quickly to relink them to care if they present to the ED again.

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"> • Diversified funding: RWHAP, other government funding, foundation grants, private and in-kind resources; • Connections with supportive services (e.g., housing, substance use support) to facilitate client referrals; • Data-sharing agreements with key health system partners (e.g., HD, ED); • IT staff with the capacity to link databases and create alerts, including a dedicated data manager; • Dedicated linkage workers (e.g., disease intervention specialists) with training in motivational interviewing, ARTAS, and harm reduction principles; and • A dedicated administrative coordinator to streamline communications. 	<ul style="list-style-type: none"> • Establish data exchange between the ED and other key health system partners, including the health department; • Establish the anticipated caseload, data management system, and strategy; • Repurpose or recruit staff dedicated to facilitating linkage to care and support services, administrative coordination, or data management where necessary; • Train staff on intervention strategies, with ongoing booster training as necessary; • Create staff and client feedback loops to ensure intervention integrity and sustainability; and • Implement intervention and re-engage clients into care. 	<p>People with HIV are:</p> <ul style="list-style-type: none"> • Identified, linked, and retained in care and other support services when they might not otherwise seek out or be offered re-linkage assistance; and • Referred to support services as needed. 	<p>Among people with HIV:</p> <ul style="list-style-type: none"> • Streamlined re-linkage efforts during ED visit; • Same-day linkage to care and support services where feasible; and • Holistic care received in an ED setting. <p>Within the implementation agency:</p> <ul style="list-style-type: none"> • Increase in services offered via low-resource methods; • Significant increase in the number of scheduled and kept HIV care appointments; • A decrease in the capacity needed for retention outreach efforts; and • A more streamlined set of coordinated care services. 	<ul style="list-style-type: none"> • Increased retention in care; • Increased viral suppression; • Decreased number of people with HIV who have high viral loads that can lead to opportunistic infections and increased transmission to others; and • Normalization of HIV medical care in ED settings.

Staffing Requirements and Considerations

Staffing for the ED Alert intervention is crucial to its success. The following staff positions were utilized in the original intervention:

- *HIV Re-linkage Specialist (also known as a Disease Intervention Specialist):* The re-linkage specialist monitors the alert system for incoming alerts from the medical center and conducts re-linkage efforts with clients in the ED. These specialists can hold roles within the health department before assuming the position, as their experiences in the health department setting can inform their ability to navigate HIV care coordination. This individual should know of existing social services available in the jurisdiction or have an interest in identifying such resources for client referrals. Given this intervention was designed to strengthen efforts at re-engaging populations that have experienced systemic inequality, this individual should be a creative thinker to provide the best care for clients and meet their holistic needs outside of HIV care that may contribute to viral suppression and other health outcomes.
- *Database System Team:* This team is comprised of individuals familiar with electronic health records systems who can extract data for research and programmatic activities. This team designs the system while the program evaluators conduct data management.
- *Data Manager:* This individual manages programmatic data and should have the capacity to adjust the alert parameters on an as-needed basis. Server maintenance and monitoring of data alerts are key responsibilities for this staff member.
- *Administrative Coordinator:* This individual manages communications between ED staff, the re-linkage team, the data manager, and the database systems team to help reduce the workload of individuals with competing priorities. The administrative coordinator can help bolster intervention fidelity by routinely checking in with different teams to gather feedback and ensure workflow is streamlined.

Staff Characteristics

Core competencies of all staff should include:

- Excellent organizational and team-building skills;
- Experience working with people with HIV and a sensitivity to the overlapping systems of oppression that contribute to treatment barriers;
- An appreciation and understanding of harm reduction approaches, motivational interviewing strategies, and the Anti-Retroviral Treatment and Access to Services intervention, which is based on a strengths-based case management model;
- Connections with community-based organizations and resources that serve as referral sites for clients;
- The ability to draw upon creative thinking when deciding how and where to re-engage people with HIV to care, with an understanding that each client may require a different approach to re-engagement;
- Proficiency in constructing and maintaining data systems; and
- A commitment to active listening to understand why clients are not in care.

“The dedicated health department data manager speaks to the importance of social support and working with staff who understand community needs: ‘Beyond just being able to connect people to an HIV care provider, I think the skill set definitely needs to focus on identifying all of those external barriers that affect their ability to stay engaged in HIV care . . . either knowledge of existing social services or support services that are available, or a willingness to identify those resources and actively seek out help.’”

Replication Tips for Intervention Procedures and Client Engagement

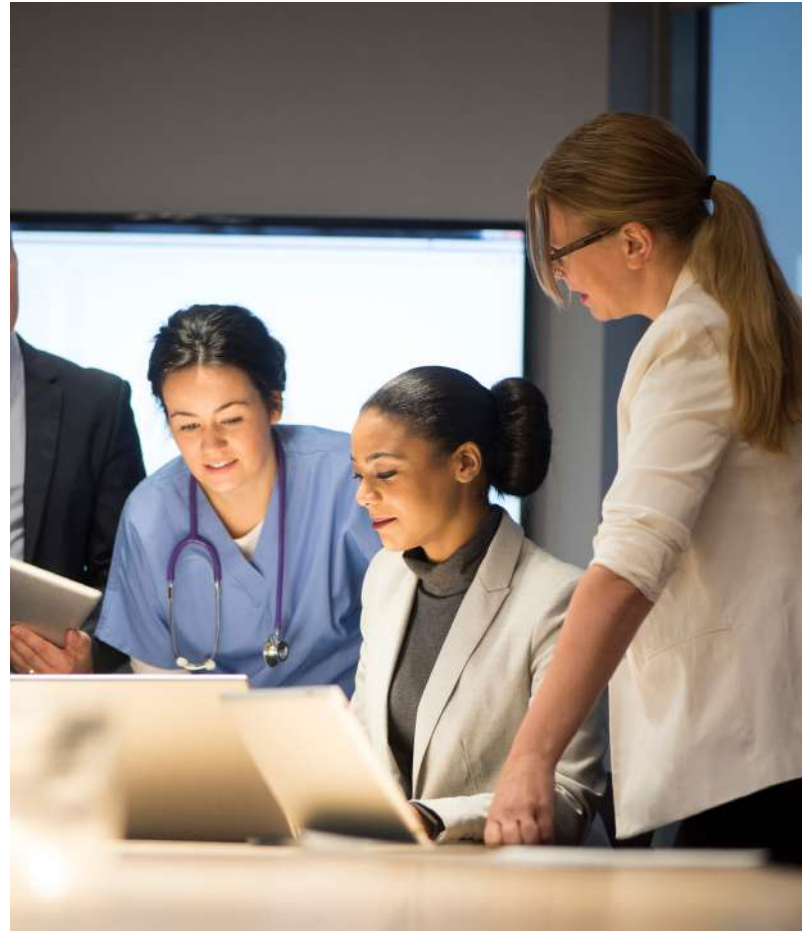
The following considerations will enable your organization to replicate the ED Alert intervention more successfully:

- *Established Relationships with ED Staff:* The success of this intervention requires a relationship with the hospital staff, including on-call nurses and emergency room doctors. It is important staff understands the initiative’s benefits and their aid in building clinical capacity. Developing a connection with the HIV care clinic in the hospital system is also important as infectious disease doctors and staff can serve as stand-ins until linkage specialists from the health department arrive.
- *ED Staff Training:* If your organization is seeking to implement this intervention, designing a motivational interviewing and informed consent training for nursing and front desk staff is beneficial. Nursing and front desk staff are often the first people that clients interact with in the clinical setting, and these interactions can either promote or impair how clients view providers, which has an impact on retention in care.
- *Assembled Linkage Team:* This intervention should be implemented in concert with existing re-engagement efforts in your organization. Existing staff, who understand the HIV care continuum, understand barriers to care, and are familiar with supportive community-based organization networks for people with HIV which are essential components of the intervention. This ensures continuity of services and does not require additional training for the linkage team.
- *Triaged Approach to Care:* For health systems that are not in proximity to the health department, it can be difficult to respond in a timely fashion when a client presents to the ED. This intervention can be adapted because in-person client interaction might not be necessary with every alert. The on-call infectious disease doctor could speak to the client before the health department staff arrives at the hospital. There are some instances where a telephone call or a video conference could suffice in re-engaging a client to care. The COVID-19 pandemic is prompting an expansion of telehealth services, which includes telephone and video appointments. As such, adopting client re-engagement via phone and video is consistent with the move toward expanding options in how HIV care is delivered.

Securing Buy-In

The success of the ED Alert intervention depends on garnering buy-in from leadership and ED staff who will interact with clients the most during their hospital stay. Some recommendations include:

- **Highlight the importance of ED staff roles** and ensure that front desk staff, nursing staff, and emergency room doctors understand the intervention's value and how staffs' roles relate to the intervention goals.
- **Incorporate the perspectives of people with HIV** who may receive re-linkage services and the health department re-linkage team to further inform activities and build community support.
- **Build and maintain relationships with leadership across all stakeholders to ensure their support.** These relationships are especially useful if challenges arise that a data manager or linkage specialist cannot address. Leaders can vouch for the project as an important initiative that deserves support. Additionally, having strong relationships with ED staff allows the linkage specialist to cross-collaborate and gather information about clients who may be on a provider's panel.
- **Intentionally connect staff with social service organizations that offer wraparound services.** This ensures clients receive several benefits and allows staff to leverage existing relationships with providers to tailor referrals based on their life experiences and needs.
- **Decrease the time burden for clinical staff whenever possible by leveraging dedicated staff.** This can be achieved by having a dedicated linkage specialist, hiring

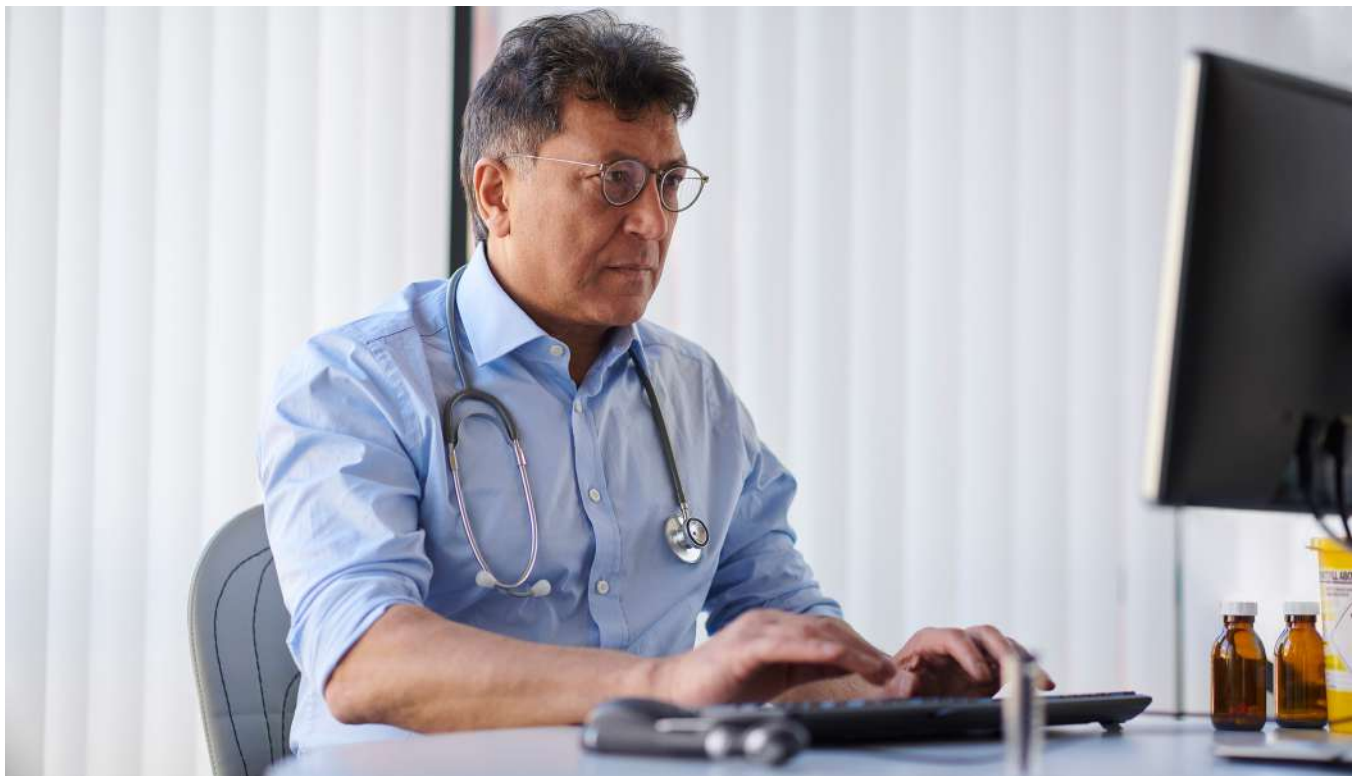


a dedicated administrative coordinator, and working with providers and staff to identify opportunities to avoid extra work. Staff will be more interested in adopting a new intervention if they consider the intervention to be something that organically embeds itself into their responsibilities.

Overcoming Implementation Challenges

Barriers to implementing the ED Alert intervention can vary based on the replicating site's existing infrastructure and workflow. However, some anticipated challenges and suggestions to overcome them are noted below:

- **Lack of Buy-In:** It is not possible to effectively implement this intervention without obtaining buy-in at the leadership and managerial levels across all key stakeholders required for data exchange and re-linkage activities. Identify a champion within the organization who believes in the intervention, can highlight the benefits of the intervention and can promote it to leadership while maintaining momentum and staff morale.
- **Lack of Administrative Support:** In cases where a dedicated administrative coordinator or data manager are not available, staff may find it difficult to balance and maintain the monitoring of alerts and client data while also being involved in direct service. Be clear on all staff roles and responsibilities and recruit dedicated people to fill these roles to streamline workflow and promote sustainability.
- **Staff Turnover and Ongoing Training:** The re-linkage specialist, administrative coordinator, and data manager are important for program continuity. Hire dedicated staff for each of these roles solely responsible for their specific duties. Train other staff as part of succession planning should there be staff turnover. Ensure that the collaborative health system has existing staff in place to maintain the data exchange system.
- **Data-Sharing Challenges:** Gather information about current clinic policies and lessons learned from other interventions to improve the data-sharing process.
- **Delayed Data Sharing:** Ensure data extraction and surveillance data matching is conducted in a timely manner. By improving the timeliness of data sharing, your organization can ensure that, for example, you have the most up-to-date client information, which can facilitate prompt re-linkage efforts.⁶



Promoting Sustainability

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

- *Explore Diverse Funding Sources:* Successful replication of the ED Alert intervention may require organizations to explore various funding sources, particularly those supporting an ongoing health system data exchange and linkage services for clients with varying insurance coverage.
- *Promote Flow of Information between ED and Re-linkage Team:* During initial conversations with leadership and stakeholders, discuss anticipated barriers to effective data exchange, client caseload, data variables to be collected and shared, strategies for effectively managing data, and processes to match data with health department surveillance records should this be done manually. This ensures data are accurate and timely and promotes a healthy flow of information between ED providers and the re-linkage team.
- *Consistently Monitor and Evaluate Project Outcomes:* By taking proactive steps to

measure the success of re-linkage efforts, a clinic can identify areas of improvement that can increase the number of clients linked to care and address any barriers. Clinics can also gather feedback directly from linkage specialists, providers, staff, and clients in various ways (e.g., group or individual check-ins or surveys). By creating a consistent and intentional feedback loop, clinics can ensure outreach efforts are effective and concerns are prioritized as they arise.

Efforts can be evaluated by focusing on the number of clients who are ultimately relinked to care. To do this, complete ongoing process and outcome evaluations that document the following:

- Number of cases closed out by the linkage specialist;
- Number of clients who are truly out of care;
- Estimated number of clients who intervention staff think would have re-engaged in care without the intervention; and
- Number of clients linked to care because of the intervention.

SWOT Analysis

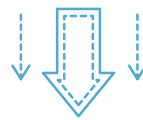
SWOT is an acronym for Strengths, Weaknesses, Opportunities, and Threats. A SWOT analysis is a structured planning method that can assess the viability of a project or intervention. By conducting a SWOT analysis in advance of an intervention, organizations can proactively identify challenges before they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



STRENGTHS

The ED Alert intervention increases viral suppression in people with HIV and retains them in care by:

- Coordinating a data exchange with key health system partners to ensure real-time identification of people with HIV who have fallen out of care,
- Re-engaging people with HIV to care and supportive services on the same day of their ED visit,
- Employing a dedicated linkage worker to address alerts promptly,
- Addressing the late HIV diagnoses gap experienced by people of color who may not otherwise be engaged or retained through traditional medical care,
- Filling gaps in medical records that may contribute to health inequities, and
- Establishing strong relationships between the ED and health department staff.



WEAKNESSES

Agencies will find it challenging to implement this intervention without:

- Necessary funding for the maintenance of the data exchange system,
- Buy-in from leadership and community stakeholders,
- Dedicated linkage workers or administrative personnel,
- Local data-sharing agreements with local or state health departments,
- Comprehensive and secure data exchange systems,
- Dedicated staff with backgrounds in HIV, linkage, and EHR data systems, and
- Ability to reach the client and coordinate their care once they are identified in real time.



OPPORTUNITIES

The ED Alert intervention offers opportunities to:

- Re-engage people with HIV into care by matching out-of-care client lists with surveillance data in real time,
- Leverage the broader health information landscape to close the out of care gap, and
- Streamline linkage and retention using a dedicated linkage team.



THREATS

Threats to the success of the intervention may include:

- An inability to secure funding for the data exchange system,
- Not retaining staff who design and oversee the data exchange system,
- An inability to identify, recruit, or secure buy-in from leadership and ED staff (nurses, front desk workers, etc.),
- A lack of willingness to integrate efforts with health departments to re-engage people with HIV to care, and
- A lack of available social support services to help address barriers to retention for people with HIV.

Conclusion

The ED Alert intervention applies a data-to-care approach to identify people with HIV who are out of care and whose viral load exceeds 200 copies/mL. This intervention utilizes a real-time data exchange system of alert prompts used to re-engage people with HIV to care when they present to the ED or IP units. This intervention found that post-intervention participants were 1.08 times more likely to have a viral load test within three months after an ED visit or IP admission and 1.50 times more likely to reach viral suppression within six months than clients in the pre-intervention period. Emergency room visits are opportune to re-engage people with HIV to care, especially as there is evidence that people with HIV disproportionately access the ED for medical care due to insurance status and comorbid conditions.



Additional Resources

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

HIV National Strategic Plan

hiv.gov/federal-response/national-hiv-aids-strategy/national-hiv-aids-strategy-2021-2025

CIE Cost Analysis Calculator

CIEhealth.org/innovations

HIV Care Continuum

<https://www.hiv.gov/federal-response/policies-issues/hiv-aids-care-continuum>

NASTAD Data Sharing Agreement Templates and User Guide

nastad.org/resource/data-sharing-agreement-dsa-templates-and-user-guide

Anti-Retroviral Treatment and Access to Services (ARTAS)

cdc.gov/hiv/effective-interventions/treat/artas?Sort=Title%3A%3Aasc&Intervention%20Name=ARTAS

Endnotes

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⁶Hall, H. I., Mokotoff, E. D., & Advisory Group for Technical Guidance on HIV/AIDS Surveillance (2007). Setting standards and an evaluation framework for human immunodeficiency virus/acquired immunodeficiency syndrome surveillance. *Journal of Public Health Management and Practice*, 13(5), 519-523. <https://pubmed.ncbi.nlm.nih.gov/17762698/>