



An Interactive Preventive Care Record



A Handbook for Using Patient-Centered Personal Health Records
To Promote Prevention



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Prepared by:

Virginia Commonwealth University, Department of Family Medicine, Virginia
Ambulatory Care Outcomes Research Network (ACORN)

Authors:

Alex Krist, M.D., M.P.H.*
Stephen Rothemich, M.D., M.S.*
Paulette Kashiri, M.P.H.*
Rebecca Etz, Ph.D.*
Ghalib Bello, M.S. ‡
Robert Johnson, Ph.D.* ‡
Eric Peele§

Steven Woolf, M.D., M.P.H.*, †
John Loomis**
Kristin Schmidt*
Steven Mitchell*
Melissa Hayes*
Daniel Longo, Sc.D.*
Anton Kuzel, M.D., M.H.P.E. *

* Virginia Commonwealth University, Department of Family Medicine

† Virginia Commonwealth University, Center on Human Needs

‡ Virginia Commonwealth University, Department of Biostatistics

§ RTI International

**Fairfax Family Practice Centers



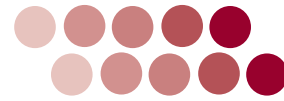
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- **Our practice-based research network partner**—the Virginia Ambulatory Care Outcomes Research Network (ACORN).
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For More Information

Questions about this handbook should be directed to Alex Krist, M.D., M.P.H., Virginia Commonwealth University at ahkrist@vcu.edu.

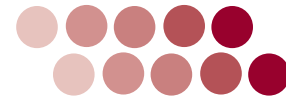




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Introduction

Purpose of This Handbook

This step-by-step guide introduces you to—

- Using personal health records (PHRs) to promote prevention.
- Preparing your practice to use a PHR for promoting prevention.
- Implementing and sustaining the use of a PHR for prevention.

The intended audience for this guide includes primary care practice personnel (e.g., office managers, clinicians, and nurses), practice leaders responsible for selecting informatics systems and ensuring that they are implemented well, and practice informatics staff.

Although the content of this guide can apply to using any PHR to promote prevention, we have focused on a specific type of PHR called an Interactive Preventive Health Record (IPHR). An IPHR is a highly advanced, patient-centered, evidence-based, patient portal focused on prevention. As information systems continue to advance, we believe that more PHRs will have interactivity functionality in the future.

Given the similarities between preventive and chronic care, the steps in this guide can also apply to using an IPHR to promote chronic disease management.

We have used organizational change theory to help determine the steps in this guide. While some steps may be specific to large practices and health systems, the concepts apply equally well to smaller primary care practices.

Handbook Development

The recommendations in this guide are based on our experiences creating, implementing, and evaluating an IPHR in three studies conducted between September 2007 and March 2012. The studies involved 14 primary care practices with a wide variation in location, patient populations, internet use, electronic health record (EHR) experience, PHR experience, information technology infrastructure, organizational culture, and practice ownership. Three different EHRs that are widely used nationally—Allscripts Enterprise™, Allscripts Professional™, and Epic EpicCare™—were used by the participating practices. In March 2012, when this guide was drafted, more than 25,000 patients regularly used the IPHR, with 300 to 400 new patients signing up per week.

The continuum of studies represented were funded by the Agency for Healthcare Research and Quality to test the effectiveness of an IPHR on the delivery of recommended preventive services, whether practices could adopt and implement an IPHR for their entire patient population, and whether an IPHR could be disseminated to typical primary care practices.

Two studies were observational cohorts (R21 HS018811-01 and RFTO #17, 290-07-100113) and one was a randomized controlled trial (R18 HS17046-01). All three studies used combinations of key informant interviews, learning collaboratives, and practice observations to guide the implementation and use of the IPHR. All three studies employed both quantitative and qualitative analyses including EHR data, IPHR data, patient surveys, clinician surveys, and transcripts from interviews and collaboratives.



Handbook Organization

This guide is organized into four basic sections with references and appendixes for more detailed information. Whenever possible, we have provided hyperlinks to external information, resources, and tools.

- Section 1: Information about IPHRs
- Section 2: Getting Started
- Section 3: Setting Up the Technology
- Section 4: IPHR Implementation
- Section 5: References

Using This Handbook

This guide addresses the entire lifespan of implementing an IPHR. We discuss topics from what makes a PHR an IPHR to sustaining the use of an IPHR once it is implemented. Most readers will not benefit from reading this guide from cover to cover. Different sections will benefit different people at different periods in the IPHR implementation process.

Different audiences may want to read different sections of this guide at different times.

Practice leaders will be interested in Section 1 when selecting a PHR/IPHR, Sections 2 and 3 when creating a practice/organization strategy to start IPHR implementation, and Section 4 when implementing the IPHR and again to review sustaining IPHR use 6-12 months after initially fielding the IPHR.

Informatics staff will be interested in Section 1 to understand the IPHR's functions and Section 3 to guide the technical integration of the IPHR.

Practice personnel will be interested in Section 1 to understand the IPHR's functions and Section 4 when implementing the IPHR and again 6-12 months after implementation when focusing on sustaining IPHR use.

Icons

The following icons are used throughout the guide to highlight certain information:



Highlights key tips and important points you may want to focus on.



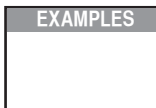
Highlights additional resources if you are interested in more information.



Highlights additional tools that you might want to use.



Highlights caveats or cautions.



Provides relevant examples.

General Guide Caveats

- **An IPHR is not the only solution to ensure that patients get the preventive services they need.** Many interventions have been demonstrated to increase the delivery of prevention.¹ An IPHR should be one part of a larger solution.
- **The best way to get IPHR functionality will differ for different practices.** Some practices may need to buy an application to augment their information system's functionality. Other practices may be able to just change how they use their current system.
- **Organizational change theory is one model to guide an implementation process.** Other models could be used to guide the implementation of an IPHR.^{2,3}





Section I: Information About IPHRs

We broadly define a PHR as an electronic health information system for patients. PHRs can be stand alone or integrated into the EHR of the patient's clinician. We define an IPHR as a PHR that can perform very specific functions. An IPHR is patient-centered, advanced, and evidence-based. An IPHR is designed to make preventive information actionable for patients and clinicians.



Read more about different types of PHRs at—

[JAMIA. 2006; 13:121-6⁴](#)

[NEJM. 2009; 360:1276-8⁵](#)

The Importance of Prevention

The immediate question you might ask is “Why should I use my PHR to promote prevention?” The simple answer is threefold: (1) prevention is highly effective, (2) many Americans are not up-to-date with recommended services, and (3) prevention is important and relevant to most patients.

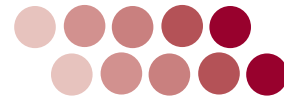
Clinical preventive services, broadly defined as screening tests, immunizations, counseling, and preventive medications, are highly effective at extending and improving the quality of life. Screening tests, through the timely identification of reversible or treatable conditions, can reduce mortality from major chronic diseases by 15 percent to 30 percent.⁶⁻⁸ Immunizations can lower the incidence of serious infections by as much as 50 percent.⁹ Effective health behavior counseling can dramatically reduce the 38 percent of deaths attributable to smoking, physical inactivity, unhealthy diet, and problem drinking.¹⁰

Yet Americans are suffering from a “prevention gap”—receiving only half of recommended care.¹¹ A host of patient, clinician, and health care system barriers exist.¹²⁻¹⁵ Patients may lack knowledge about needed services, have limited motivation to receive services, or face logistical challenges. Clinicians may fail to address needed services due to oversight, lack of time, and competing demands. The health care system is fragmented and there are few tools and little infrastructure to support both clinicians and patients. To a large extent, the typical system for delivering preventive care is reactive, relying on patients to schedule wellness visits and on clinicians to recognize when preventive care is due.

One proposed solution is to harness the power of PHRs. Well-designed PHRs can give patients evidence-based information about what is recommended—tailored to their individual risk factors (e.g., age, gender, comorbidities, prior testing, family history, health behaviors)—and presented in understandable language and format.¹⁶ PHRs can remind patients when services are due, supply guidance to deal with inconsistent recommendations, and direct patients to decision aids for choices that require shared decisionmaking.¹⁷⁻¹⁹ To act on their choices, PHRs can give patients written plans and concrete logistical support.^{20, 21} Because a key barrier for clinicians is lack of time and resources to provide these resources, PHRs can automate and systematize this process.²²

Defining an IPHR

An IPHR is a highly patient-centered, advanced, evidence-based, patient portal focused on prevention. Both patients and clinicians use an IPHR—clinicians through their EHR and patients through their PHR. This brings clinicians and patients together around the common goal of



prevention. An IPHR also supports many of the functions of a patient-centered medical home.^{23, 24} As currently designed, most EHRs and PHRs do not have IPHR functionality.

Overall, an IPHR can perform five general functions:²⁵

1. Collect information from patients.
2. Collect clinical information from existing electronic records.
3. Present patients with their clinical information, translated into lay language.
4. Give patients concrete, individualized clinical recommendations by applying their information to evidence-based guidelines.
5. Facilitate informed patient action integrated into clinical care through the provision of personally tailored educational material, decision aids, risk calculators, motivational messages, logistical support, and reminders.

Clinically, an IPHR can assist patients, clinicians, and staff as follows:

Patients

- Help patients prepare for wellness or chronic care visits.
- Give patients personalized health recommendations.
- Motivate and activate patients to get needed care.
- Help to explain lab results to patients.
- Direct patients to self-management tools.
- Share decision aids with patients.
- Act as a reminder system for patients and practices.



Clinicians and staff

- Meet Medicare Annual Wellness Visit requirements.
- Support Meaningful Use.
- Report Physician Quality Reporting System measures.
- Serve as a tool for performance monitoring and benchmarking.
- Allow easy population management of entire practice populations.

Some EHRs and PHRs have IPHR functionality; many do not. As EHRs and PHRs advance in the future, they will hopefully incorporate more IPHR functionality.



TABLE 1. CHARACTERISTICS OF TRADITIONAL EHR/PHR VERSUS IPHR FUNCTIONALITY

Basic EHR or PHR Functionality	IPHR Functionality
Recommendations are individually determined and maintained by practices using the EHR/PHR	Recommendations are centrally determined and maintained based on national evidence-based guidelines
Content is displayed in clinical language	Content is displayed in patient/lay language
Content is stored and displayed as entered into the system	Content is interpreted and the system explains the meaning of information
Content is generic, varying only by age and gender	Content is individually tailored to important user characteristics
Design is primarily informed by the vendor	Design is primarily informed by users
Recommendations are made with little or no supporting material	Tools, resources, educational material, decision aids, and logistical support are provided to patients to help them take action
Content is similar for all users nationally	Content is tailored to local resources and support
Systems are designed without significant consideration of practice workflow and needs	Systems are designed to integrate into practice work flow and needs
Functions may require users to trigger actions (e.g., overdue care reminders)	Functions are automated, requiring minimal practice action to provide patients information

Read more about IPHRs at:

- [JAMA. 2011; 305:300-1](#)²⁵
- [BMC Med Inform Decis Mak. 2011; 11:73](#)²⁶



Access these videos about IPHRs:

- [JAMA Author Interview](#)—A vision for patient centered health information systems
- [VCU News Center](#)—Making health information technology more patient-centered.

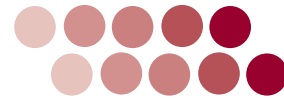
Take a tour of one IPHR called:

- [MyPreventiveCare](#)



Go to screenshots showing how one IPHR works:

- <http://annfammed.org/content/10/4/312/suppl/DC1>



IPHR Results To Date

The 14 study practices that implemented an IPHR demonstrated that patients will use an IPHR, clinicians and nurses can integrate an IPHR into their daily workflow, and an IPHR does increase the delivery of recommended preventive services.

An IPHR was found to help patients and practices in the following ways:

An IPHR increased delivery of preventive services

- Nearly twice as many patients were up-to-date on all recommended preventive services after using an IPHR.
- Increase in colon cancer screening from 53 percent to 72 percent.
- Increase in cervical cancer screening from 80 percent to 91 percent.
- Increase in tetanus vaccination from 58 percent to 71 percent.
- Increase in pneumococcal vaccination from 48 percent to 62 percent.
- Similar increases were not seen for non-IPHR users.

EXAMPLES

IPHR use doubled the percent of patients up-to-date on prevention.

An IPHR helped find patients overdue for care and helped practices update their records

- An IPHR identified that among patients—
 - 49 percent were due for a screening test.
 - 56 percent were due for a vaccination.
 - 91 percent needed health behavior counseling.
 - 55 percent needed to consider a preventive medication.
 - 35 percent had inadequate control of a chronic condition.

EXAMPLES

After using an IPHR, 59 percent of patients gave practices information to update their records.

Practices were able to get patients to use an IPHR

- In 1 year, 14 practices got 25,210 patients to create an IPHR account, representing up to 25 percent of the patients seen by the practices.



● “It’s just so easy to use and there are no complications.”—Practice Nurse

● “It is just part of our everyday spiel, you know, when we’re talking to patients.”—Practice Clinician





An IPHR helped practices care for patients



- “The nurses are like, “This is great. We get less phone calls.”—Practice Clinician
- “We get a lot of [patients] that call in and say...[I] was just on the website and it suggested that [I] follow-up for this or that.”—Practice Office Manager
- “The patient probably places a higher value on it because they’re feeling like the information they’re getting is a direct response to their results and values.”—Practice Clinician
- “Patients are really interested in self-teaching more than I realized. [I say] go check that cholesterol information. All of a sudden, [the patient has] read some articles and understands what is going on.”—Practice Clinician



Read about the results of patient use of an IPHR at:

- [BMC Med Inform Decis Mak. 2011; 11:73²⁶](#)



Read about the effect of an IPHR in a randomized controlled trial:

- [Success stories from the AHRQ-funded health IT portfolio](#)
- Krist AH, Woolf SH, Rothemich SF, et al. Randomized trial of an interactive preventive health record to enhance the delivery of recommended care. *Ann Fam Med* 2012;10(4):312-9.

Not all practices will have the same results we observed.

While we took efforts when developing this guide to include practices that represented primary care, only 14 practices participated in our studies. Practices were located in Virginia. Although several practices served disadvantaged patients, practice patients generally had computer and Internet access.





Section 2: Getting Started

This section describes the characteristics of a practice that is ready to implement an IPHR, the resources needed to effectively implement an IPHR, and the technical process of linking an IPHR into an existing EHR.

General IPHR Implementation Process

The implementation process described in this guide is based on organizational change theory.^{2, 3, 27-31} It is designed to engage practices to create a shared vision on how to integrate an IPHR into care delivery using practice champions, learning collaboratives, and a patient-centered communications strategy. Specific components include—

Learn more about organizational change theory from the National Cancer Institute's [*Theory at a Glance*](#).



1. Securing leadership buy-in and support.
2. Developing a culture conducive to change.
3. Establishing a guiding coalition.
4. Generating a sense of priority.
5. Developing and communicating a shared vision.
6. Setting goals for short-term wins.
7. Empowering members to act on the vision.
8. Consolidating improvements and institutionalizing success.

Assessing Readiness for an IPHR

A practice is ready to implement an IPHR if it has the following:

- A culture that prioritizes effective evidence-based preventive services. Prevention delivery goes beyond ensuring that patients receive a service and includes educating patients, generating longitudinal prevention plans, supporting self management, and ensuring incorporation of patient values and beliefs.
- Top leadership commitment and support for the IPHR implementation process. Staff, funding, and time are needed for organizational change.
- An existing EHR. An IPHR requires the automated transfer of detailed patient clinical information. Without this information, an IPHR cannot fully function.
- Informatics expertise or assistance. Until add-on programs can be simply installed on EHRs, like applications on a smart phone, some informatics expertise is required to create a seamless integration between an IPHR and an existing EHR.

EXAMPLES
You are ready to implement an IPHR if you have: 1. A focus on prevention 2. Leadership support 3. An EHR 4. Informatics expertise



Questions to consider prior to deciding whether to implement an IPHR:

- Does an IPHR fit with your practice's mission?
- Will an IPHR help your patients?
- How do you envision an IPHR fitting into your workflow?
- Can an IPHR work with your information systems?
- Are you implementing other changes that would compete with implementing an IPHR?

Resources Needed To Implement an IPHR

Several resources are needed to implement an IPHR—(1) leadership, (2) change support, (3) information technology infrastructure, (4) practice personnel, and (5) receptive patients.

Leadership

Successful IPHR implementation requires active involvement from three levels of leadership, each with a distinct and essential role. If leadership fails at any of these three levels, the resulting IPHR implementation will be suboptimal.

- **Organizational leadership** is charged with creating a sense of priority for implementing an IPHR, directing activities at the organization level, and ensuring that needed resources are available for IPHR implementation.
- **Practice leadership** locally supports and tailors the IPHR implementation to an individual practice's needs, culture, and resources.
- **Individual leadership** refers to all IPHR implementation participants and all IPHR users. Leadership activities include supporting organizational and practice leadership, participating in implementation activities, coordinating daily use, and actively providing positive reinforcement and encouragement.

Change Support

Implementing an IPHR requires personnel time and expertise.

- A **facilitator** is needed to coordinate and run learning collaborative meetings. An effective facilitator needs some familiarity with running learning collaboratives.
- **Practice champions** are local experts committed to implementing an IPHR. Champions serve as practice cheerleaders who catalyze change.
- **Learning collaborative members** serve as a practice's guiding coalition for implementing an IPHR. It is important for all of a practice's personnel to have representation within the learning collaborative. If learning collaboratives are multi-practice, representatives from each practice must be included.
- While **specific staff training activities** will vary based on each practice's needs, all staff members need protected time to learn about the IPHR and understand their role in using the system. Often practice champions and/or learning collaborative members can lead training activities.



Technology Infrastructure

Given the detailed and extensive clinical data needs of an IPHR, it cannot function without an effective practice health information technology infrastructure. Specific requirements include:

- **An EHR.**
- **Preventive data** stored in a standardized electronic format within the EHR.
- **Lab and radiology interfaces** to allow for the automated flow of preventive data into the practice's EHR.
- Ability to **assess and track EHR data quality** to ensure that preventive data is being stored in a manner the IPHR can access and interpret.
- **Informatics personnel** to function as intermediary between EHR and IPHR vendors, configure local systems, assess and track EHR data quality, solve problems, and maintain the EHR-IPHR connectivity.



Get a list of the clinical data elements you will need for your IPHR to work from [BMC Med Inform Decis Mak. 2011; 11:73.](#)²⁶

When preparing to show patients their health information through an IPHR, many practices will have to make both technical and workflow changes to improve the quality of clinical information in their EHR.



Practice Personnel

Practice personnel are the front-line staff who will use an IPHR on a daily basis for clinical activities. If implemented well, an IPHR can save time for many practice personnel.

- **Phone center staff** can initially inform patients about an IPHR, encourage them to use the system, answer questions about the system, and use population management tools to reach out to patients overdue for care.
- **Front desk staff** can systematically direct patients to use an IPHR for their clinical care as they check in for an appointment.
- **Nurses and Clinicians** can encourage patients to use an IPHR as well as use it themselves to activate patients to get needed care, provide self-management tools, deliver decision aids, explain lab results, and act as a reminder system.

Patients

Ultimately, patients must use an IPHR to receive clinical benefits. The ability to customize the content and language of an IPHR to different patients and practices allows IPHRs to appeal to a wide range of populations. However, patients must be able and willing to use the internet for their health. Given that the percent of Americans who looked online for health information increased from 30 percent to 62 percent between 2006 and 2009, this is not likely a barrier for most practices.³²

EXAMPLES

"I've been waiting for you guys to do something like this for a long time."—Patient's response to one practice's IPHR implementation.



TABLE 2. SUMMARY OF RESOURCES NEEDED TO IMPLEMENT AN IPHR

Staff Members	Responsibilities	Time Requirements
Organizational leadership	Provide leadership, guidance, and support for the implementation; hold practices accountable; assist with problem solving	Project oversight throughout
Practice leadership	Locally support the implementation; hold practice members accountable for implementation	Project oversight throughout
Learning collaborative members	Participate in learning collaboratives and perform associated tasks between sessions; direct local implementation; train staff locally	Attend seven 1.5 hour learning collaborative sessions; 10 hours per month for implementation tasks
Clinicians	Participate in training; use the IPHR	0-2 hours per month
Practice staff	Participate in training; use the IPHR	0-2 hours per month
IT staff	Integrate the IPHR and EHR; create seamless practice and patient experiences; provide ongoing performance reports; maintain integration with system upgrades	Time varies (anticipate 100-200 hours)



Section 3: Setting Up the Technology

From the technical perspective, the primary task with setting up an IPHR is getting two separate systems—an EHR and an IPHR—to work together. The IPHR must first get information out of the EHR, to share with patients, and then push information back into the EHR, to share with clinicians.

In order to be effective, this process needs to be seamless. For patients, it should be convenient and user-friendly. For clinicians, it should be integrated into existing workflows and information systems.

Getting Data out of the EHR

The first technical step of integrating an IPHR into an EHR is to enable the IPHR to get patient data from the EHR. The data transfer needs to—

- Provide the most up-to-date patient data.
- Include all necessary information about preventive care.²⁶
- Be initiated by a patient using the IPHR.
- Be secure and HIPAA-compliant.

EHR Data Transfer Mechanisms

Four general mechanisms exist for EHR data transfer. Each mechanism has advantages and disadvantages. These options may be available in EHRs as part of their normal functionality.

Data transfer mechanisms are rapidly changing with the evolution of both Meaningful Use and Health Information Exchanges.^{33, 34}



1. **Have the EHR write a prevention summary document and send it to the IPHR.** Many EHRs have the capability of generating standardized, patient-level summaries that can be electronically exchanged. Summary documents like the Continuity of Care Record (CCR) and Continuity of Care Document (CCD) are examples of standardized patient health summaries.^{35, 36} An IPHR could be configured to trigger the transfer of an EHR's CCR or CCD to obtain a patient's clinical data.
 - + Advantages—standardized format; maintained by EHR vendor; and many EHRs have these summary documents, as they are mandated by Meaningful Use.
 - Disadvantages—IPHR may not be able to initiate the transfer of a summary; vendors' pre-programmed summaries may not contain all of the data needed by an IPHR; and the EHR vendor controls the content of the summary.
2. **Have the IPHR “request” data from the EHR using a built-in query program.** This transfer mechanism is called a **Web service**. A Web service is a program embedded within an EHR that other systems can trigger to perform a predefined action. Some EHRs have Web services that will transfer clinical data elements to external systems. An IPHR could be configured to trigger these EHR Web services.
 - + Advantages—standardized format and maintained by EHR vendor.



- Disadvantages—may need to trigger multiple Web services to get all of the data an IPHR needs; Web services may not be available to transfer all of the data needed by an IPHR; and the EHR vendor controls the content of the Web services.
- 3. **Build a parallel copy of the EHR data that an IPHR can use directly.** This method is commonly called a **data warehouse**. A practice could create a separate data warehouse, containing all the data an IPHR might need. Then an IPHR could be configured to access the warehouse for a patient's clinical data.
 - + Advantages—a practice can control the content and design of a data warehouse; a warehouse separates IPHR functions from patient care functions, and accessing data from a warehouse is quicker than directly accessing an EHR's database.
 - Disadvantages—a warehouse will need to include data for all of a practice's patients (even those not consenting to use the IPHR) in order for a new user to be able to use the IPHR; a warehouse needs scheduled updates; and EHR data entered after the latest warehouse update would not be available.
- 4. **Directly access data within the EHR database.** An IPHR could be configured to directly access data within an EHR using an open database connection (ODBC).
 - + Advantages—can access all of the data needed by an IPHR and can be tailored to a range of ways that practices enter data in their EHR.
 - Disadvantages—requires knowledge of EHR data architecture; requires ongoing maintenance to support connections; practices may be nervous about directly accessing their EHR database; and a poorly designed connection could slow an EHR's performance.

Use [AHRQ's Health Information Exchange Evaluation Toolkit](#) to help set up your health information exchange.



Getting IPHR Data Into the EHR

The second technical step of integrating an IPHR into an EHR is to establish a mechanism for an IPHR to send information back into the EHR for the clinician. By sending information into the EHR, an IPHR can—

- Allow patients to update their clinical information.
- Create a mechanism to populate the EHR with patient reported data (e.g., health behaviors, values, psychosocial issues, goals, etc.).
- Inform clinicians about what information patients reviewed when visiting the IPHR.
- Provide clinicians with care summaries.
- Provide clinicians with reminders about overdue care.

IPHR Data Transfer Mechanisms

Three general mechanisms exist for an IPHR to send information into an EHR after a patient uses an IPHR. Each mechanism has advantages and disadvantages for data transfer.



1. **Discrete data.** The highest level of integration is for an IPHR to send information into an EHR as discrete data elements. This mechanism generally uses HL7. Data elements can be reviewed by clinicians and if accepted, can become part of the EHR data.
 - + Advantages—automatically populates EHR with data; data imported into EHR can be queried and tracked and can be incorporated into an EHR’s Meaningful Use features (clinician alerts and reminders).
 - Disadvantages—requires greatest effort to create and maintain and may create multiple EHR tasks for clinicians to review and verify.
2. **Electronic document.** Alternatively, an IPHR can generate a single summary document and send it electronically into an EHR. This mechanism also generally uses HL7. The summary document will likely appear in the EHR as an electronic document, similar to a note generated by a clinician.
 - + Advantages—automatically populates EHR with summary notes and summary can be easy for clinicians to review at point of care.
 - Disadvantages—does not populate EHR with data.
3. **Faxed document.** If the above two options are not available, an IPHR can automatically send a faxed summary document into an EHR.
 - + Advantages—easiest mechanism to send information into an EHR.
 - Disadvantages—does not populate EHR with data and may need to manually link the document to a patient’s chart.

Creating a Seamless Practice Experience

In order to be used by practices, it is important that the IPHR be seamlessly integrated into the practice’s EHR. Several characteristics create a seamless experience:

- Clinicians access IPHR information directly through their EHR.
- Transfer of IPHR information into a practice’s EHR is automated.
- IPHR data to be reviewed and verified should have a similar workflow as lab results.
- IPHR summaries should have a similar workflow as other documents.
- IPHR alerts and reminders should have a similar workflow as other alerts.
- IPHR information should be automatically directed to the appropriate practice staff.

Creating a seamless, integrated experience often requires cooperation and assistance from the EHR vendor.

Creating a Seamless Patient Experience

Practices may have multiple patient websites and portals that perform different functions. For example, a practice might have a general practice Web site, an administrative portal for scheduling appointments and paying bills, and a portal for secure messaging.



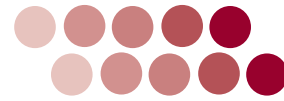
Ideally, these Web sites and portals should be integrated to create a seamless patient experience. The simplest integration can be links on each site to the others. However, patients would need to create accounts on each site and sign into each site when transferring between them. More sophisticated integrations can create single sign-on experiences for patients, allowing them to transfer between sites without needing to log out and log in.

Working With Vendors

EHR and IPHR vendors have many clients and many competing demands. Complicating this, different vendors have different capacities to exchange the minimal prevention data set or integrate with other systems. Assisting a practice with locally tailoring or improving their system may not be a high priority for a vendor. Some vendors may even view integrating external components as competition with their product.

Strategies for success when working with EHR and IPHR vendors include—

- **Understand your vendor's interests**—Learn about the way your vendor thinks their system works. This may be different from how you use your system. Learn about your vendor's roadmap for future development. How do your interests fit into this roadmap? Sources of information may include your vendor's Web site, regional and national meetings held by your vendor, and your vendor's representative.
- **Work through existing relationships**—You should have a relationship with your vendor and that relationship should be important to your vendor. Vendor representatives for smaller practices tend to be sales representatives, whereas larger health systems may have direct contact with more senior staff and designers. Ultimately, you will need to work with your vendor's decisionmakers and even programmers.
- **Create an economy of scale**—The more clients that benefit from an integration, the more a vendor is incented to work with you. Create an economy of scale by doing an integration for a group of practices or doing an integration generalizable to other clients.
- **Be flexible**—Vendors may have resource and design constraints that limit what they can do. Be prepared to be flexible and creative in solving problems.
- **Do it yourself**—Ultimately, if a vendor cannot help you with an update or integration, you may need to hire an external consultant or even do it yourself.



Section 4: IPHR Implementation

If your practice is ready for an IPHR, has the necessary resources, and is technically able to integrate an IPHR into your EHR, then you are ready to begin the implementation process.

Learning Collaboratives

The implementation process uses principles of organizational change theory to guide practices through a series of steps to make both cultural and workflow changes. Each step is coordinated and carried out through a series of learning collaboratives. Learning collaborative members are responsible for disseminating decisions and actions throughout the practice, as well as monitoring the fidelity of the IPHR implementation and encouraging sustained use. Accordingly, a good learning collaborative is essential to a successful implementation.

The learning collaborative is a group of 4 to 10 practice members representing all practice personnel who would use an IPHR. Practice groups implementing an IPHR can either have a central learning collaborative, with members from all offices, or a separate learning collaborative for each practice.

Successful learning collaboratives—

- Promote mutual respect between members.
- Value members' perspectives equally.
- Encourage all members to speak and participate.
- Empower members to make office changes.





TABLE 3. GENERAL LEARNING COLLABORATIVE TIMELINE AND AGENDA

Learning collaborative #1: 4 months prior to implementation	Review the function and purpose of the IPHR. Discuss the goals and role of the learning collaborative. Consider how clinicians enter data into the EHR that is needed by the IPHR.
Learning collaborative #2: 2 months prior to implementation	Begin to illustrate the practice's current workflow for preventive care and the plans for changing the workflow with the IPHR. Review the practice's baseline preventive care delivery measures.
Learning collaborative #3: 1 month prior to implementation	Complete the practice's workflow analysis. Develop a training program to get practice personnel prepared to implement the IPHR.
Learning collaborative #4: 1 month after implementation	Share initial go-live experiences. Identify and troubleshoot implementation problems.
Learning collaborative #5: 2 months after implementation	Review and discuss the proposed workflow revisions.
Learning collaborative #6: 4 months after implementation	Share successes and challenges with IPHR implementation. Develop strategies to overcome the challenges.
Learning collaborative #7: 6 to 12 months after implementation	Develop strategies to sustain IPHR use. Decide on future directions for the IPHR and prevention delivery.

Preparing Practices To Launch an IPHR

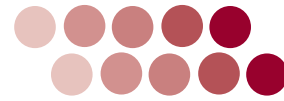
Step 1—Assemble your team

Before you can have your first learning collaborative, you need to assemble your practice's implementation team. Specific team members include—

- Learning collaborative facilitator (1)
- Learning collaborative members (4 to 10)
- Performance monitoring and reporting staff

Strategies to consider when seeking learning collaborative members include:

- **Find champions**—Ideally, learning collaborative members should buy into, support, and want to implement an IPHR.
- **Include all stakeholders**—Stakeholders are staff and clinicians of systems influenced by the IPHR. Stakeholders not included in the implementation process can become derailers. Types of stakeholders to consider include staff and clinicians involved with:



- Prevention delivery.
- Patient centered medical home design.
- Meaningful use recognition.
- Nursing activities.
- Managing phone calls.
- EHR support.
- Patient portal configuration and use.

Incorporate “derailers”—derailers are staff and clinicians who can sabotage the implementation process. One derailer in a practice can undermine an otherwise successful implementation. If a potential derailer can be included in the design of the implementation process, the derailer may be converted to a champion.

● **Get a range of perspectives and experience.**

Once your team is assembled, you can conduct your first learning collaborative.

Step 2—Evaluate your EHR data quality

Evaluating and monitoring EHR data quality is an essential step to make sure that the information patients view in the IPHR is correct. **Showing patients incomplete or inaccurate medical information reflects poorly on a practice and is not good quality care.**

Prior to the second learning collaborative, have performance monitoring and reporting staff query the practice’s EHR to generate (a) performance rates for the services addressed by the IPHR and (b) lists of patients overdue for care. The queries should use a similar methodology as the EHR to IPHR transfer.

At the second learning collaborative, members will need to review queries to make sure that the information appears valid. Specifically they should: (1) identify any errors in the EHR data transfer process that the IPHR will use and (2) identify any problems with how clinicians and staff enter information into the EHR. Data transfer errors should be reported to the IT staff integrating the IPHR and EHR.

Before implementing an IPHR, staff and clinicians often enter information into their EHR in a manner that works well for their needs, but is not amenable to an automated, electronic transfer. Many practices need to relearn how they enter EHR information when they transition to making information available to patients through an IPHR.

Common errors that prevent an electronic transfer of information include—

- Not entering information into the record.
- Not recording information in the EHR’s standard place.
- Not recording information in the standard format.
- Not using the electronic order functions within an EHR.
- Not recording information with the appropriate specificity.





- Typing information into bodies of notes as text.
- Not recording an electronic date with information.
- Relying on scanned documents for information.

As EHR data entry problems are identified in the first and second learning collaborative, members need to find ways to improve the quality of their data. Strategies include—

- Creating laboratory and radiology interfaces to automate EHR data population.
- Training staff and clinicians to enter information properly.
- Redefining staff roles to include the electronic entry of incoming information.
- Having staff re-enter incorrect information.
- Developing more efficient systems to handle paper documents.

Ideally, performance data will be presented to learning collaborative members, clinicians, and staff on a regular basis throughout and after implementation to allow for ongoing monitoring of the quality of EHR data entry.

Step 3—Understand your workflow

During the second and third learning collaboratives, members are tasked with first mapping out their current workflow for the delivery of preventive services and then redesigning their workflow to incorporate the IPHR. Adding an IPHR will likely involve several key shifts in how practices deliver preventive care that have workflow implications:

1. **Reactive to proactive.** Preventive care is often reactive. Patients call and schedule an appointment, they are seen, and care is delivered. An IPHR workflow is more proactive, identifying patients who need care before they contact the office to schedule an appointment.
2. **Paternalistic to shared.** Preventive care is often paternalistic. Clinicians tell patients what preventive services they need. However, for many preventive services there are options—whether to get a test, when to start getting tests, how often to get tests, which test to get, etc. An IPHR workflow is more shared, providing patient with information and tools about choices and incorporating patient risks and values into decision making.
3. **Individualized to systematized.** Preventive care is infrequently standardized, with each clinician and practice having a unique approach and interpretation about what preventive services to deliver. An IPHR provides support for a more standardized systematized workflow for prevention.
4. **Visit-based to extended care.** Preventive care is often visit-based. Clinicians deliver services and counsel patients solely during office encounters. Yet visits are not always warranted, not always convenient for patients, and not always adequate for some services like health behavior counseling. An IPHR workflow extends care beyond encounters, providing counseling and support to patients at home or work and even arranging for the delivery of services outside of the encounter.
5. **Clinician-centered to patient-centered.** Collectively, a more proactive, shared, systematized,



and extended approach is more patient-centered. Central to a patient-centered workflow is providing patients what they need when they need it and allowing them to more effectively manage their health.

Use [AHRQ's Workflow Assessment for Health IT Toolkit](#) to help you understand your current workflow and start thinking about how to integrate an IPHR.



Think about these questions when modifying an existing workflow to include an IPHR:

- How will you get patients to create an account?
- How will you get patients to use their account to prepare for visits?
- For what tasks will you use the IPHR?
- How will you use the IPHR for health behavior counseling?
- How will you use the IPHR for chronic disease management?
- How will you use the IPHR to help patients understand their laboratory results?
- Who will initially receive IPHR summaries?
- What will you do if the IPHR identifies a patient as overdue for care?
- Do you have the capacity to deliver care (e.g., immunizations, referrals) outside of an office visit?
- How can you use the IPHR to help update and maintain your EHR records?

Step 4—Train practice staff and clinicians

Examples of training activities include—

- Informational handouts.
- Handbooks.
- Emailed updates and reminders.
- Group lectures.
- Group “hands on” activities.
- One-on-one training.
- Question-and-answer sessions.
- Creation and use of a personal or test IPHR account.
- Peer-to-peer learning.
- Ongoing feedback and reinforcement.

EXAMPLES

Training should address three general topics:

1. Becoming familiar with the IPHR.
2. Learning about how to better enter information into the EHR.
3. Redefining roles for the revised workflow to include the IPHR.

Each practice will need to decide which training activities will most beneficial. During the third learning collaborative, members should discuss and decide upon training activities. Learning collaboratives will likely want to readdress training after the IPHR go-live date, as knowledge and training deficiencies become apparent.



Engaging Patients

During the first 6 months after going live with an IPHR, the main focus for many practices will be getting patients to create an IPHR account and to use the system. Accordingly, a key task for the fourth through sixth learning collaboratives is to review and improve on how the practice is doing with getting patients registered.

There are four general workflows for signing patients up to use an IPHR:

1. When patients are in the office, provide information about how to create an IPHR account and have the patient create an account outside of the office after the visit.
 - + Advantages—easy to explain the value of the IPHR during an encounter.
 - Disadvantages—patients will not have used the IPHR prior to the visit, and patients may not sign up when they leave the office.
2. Prior to an office visit, provide information about how to create an IPHR account and have the patient create an account prior to their visit.
 - + Advantages—patients will have used the IPHR prior to the visit, and personnel can reinforce the value of the IPHR at the visit if they have not signed up.
 - Disadvantages—may be difficult or time consuming to explain the IPHR and how to sign up prior to a visit.
3. Have patients create an IPHR account while they are in the office at a kiosk computer station or laptop.
 - + Advantages—good use of patients' time when waiting for an appointment; direct confirmation that patients have signed up, and opportunity to provide support.
 - Disadvantages—may be time consuming to do in office and may delay the appointment.
4. Automatically create IPHR accounts for all of a practice's patients.
 - + Advantages—quickly gets all patients signed on to the IPHR.
 - Disadvantages—most patients will not use their account without reinforcement, and there may be privacy concerns if patients do not select their own usernames and passwords.

In general, all of a practice's staff needs to be involved in the process of getting patients signed up to use an IPHR. Workflows that rely solely on clinicians to get patients to use an IPHR will not likely succeed. Likewise, without clinician support and reinforcement, practice staff cannot get patients to use an IPHR.



TABLE 4. STAFF AND CLINICIAN ROLES FOR GETTING PATIENTS TO USE AN IPHR

Phone Center Staff • Advise patients to create an account • Have patients use the IPHR before visits • Answer questions about the IPHR • Help patients who have trouble creating accounts	Check-in Staff • Advise patients to create an account • Give patients information about how to create an account
Rooming Staff / Nurses • Check if patients have created an account • Advise patients to create an account • Have patients use the IPHR to learn more about their results • Use IPHR summaries as standing orders to begin giving preventive services • Make clinicians aware of the IPHR summary	Clinicians • Advise patients to create an account • Have patients use the IPHR to supplement health behavior counseling • Have patients use the IPHR to learn more about their results • Have patients use the IPHR to supplement chronic disease management • Use IPHR summaries as a reminder for needed care

The following four steps can be helpful to encourage patients to use an IPHR:

Step 1—Create a message

Create a clear concise office message to (a) explain what the IPHR is to patients, (b) convey how the IPHR can be used to improve health, and (c) generate interest in using the IPHR. Once created, this message can be used by staff when talking to patients about the IPHR and can be incorporated into practice informational material.

Step 2—Reinforce and systematize/embed the process

Make encouraging patients to use an IPHR part of the standard workflow for practice activities. This provides patients reinforcement about the value of the IPHR. It also makes informing patients about the IPHR a routine response for staff and clinicians. Several opportunities to engage patients occur during most office visits. Two examples are provided in Table 5.



TABLE 5. ENGAGING PATIENTS DURING CHECK-IN AND LAB WORK

Example #1: Engaging patients during check-in	Example #2: Engaging patients during lab work
Step 1. Prior to appointments, staff attach information about how to create an IPHR account to check in materials. Step 2. When patients check in, front desk staff directs patients to IPHR material. Step 3. As nurses bring patients to exam rooms and collect vital signs, they review the IPHR material with the patient. Step 4. When clinicians see the patient, they further reinforce the IPHR material.	Step 1. Inform patients when ordering laboratory tests that they can learn more about their results through the IPHR. Step 2. Give patients information about creating an IPHR account when giving patients laboratory test orders. Step 3. Remind patients that they can learn more about their results through the IPHR when they are having their blood drawn. Step 4. When informing patients of their results, remind them to go to their IPHR account or create an IPHR account to learn more about their results.

Step 3—Automate the Process

Whenever possible, look for ways to automate the process of informing patients about the IPHR.

This is one part of creating a systematic engagement process. Examples include—

- Lobby and exam room posters and brochures.
- Practice Web site informational links.
- Information added to upcoming visit reminders.
- Check-in kiosk alerts.
- Messages on health maintenance forms.
- Information included in patient mailings.
- Email invitations.
- Information embedded in aftercare summaries.

Step 4—Track Performance

Throughout the implementation process, plan to monitor how the practice is doing with getting patients to use the IPHR. Specific measures might include (a) the number of new IPHR accounts created, (b) the number of patients seen who have an IPHR account, and (c) the percent of all of the practice's patients who have an IPHR account.

Provide clinicians and staff IPHR user reports including overall practice measures and individual clinician measures every 1 to 2 weeks. At each learning collaborative after go-live, members should

EXAMPLES
Measuring IPHR use can— 1. Identify problems with engaging patients, 2. Encourage increased effort for clinicians with poor uptake 3. Reinforce behaviors for physicians with good uptake.



review performance measures to identify high and low performers. Talk with these clinicians and staff to learn about barriers and facilitators for getting patients to use the IPHR.

Practice Use

A second key focus during the first 6 months after going live with an IPHR will be encouraging the practice's staff and clinicians to use the IPHR. During the fourth through sixth learning collaboratives, members will need to review and improve on how well the practice is using the IPHR.

The general concepts for engaging patients to use an IPHR also apply to getting clinicians and staff to use an IPHR. Learning collaborative members should *create a message* explaining to clinicians and staff how to use the IPHR to deliver care and should incorporate this message into the training process. Workflow should be *systematized, automated, and reinforced* to make it easier for clinicians and staff to use the IPHR as intended. Finally, practice use of the IPHR should be tracked, and clinicians and staff should be *provided feedback* about how well they are using the IPHR.

There are two general categories of new tasks for practices using an IPHR:

1. Practices need to address IPHR summaries.
2. Practices need to use the IPHR as a tool for care delivery.

Addressing IPHR summaries

Most IPHR summaries provide practices with—

1. Information that patients have reviewed and corrected in their record.
2. Information provided by patients, typically regarding health behaviors, psychosocial issues, values, and goals.
3. An overview of preventive and chronic care dates and values.
4. A list of needed preventive services and chronic care needs.

Practices need a planned workflow to deal with the information provided by IPHR summaries. An IPHR can be programmed to automatically direct summaries to specific clinicians or staff. A key decision for practices is who should receive this information. The two main options are—

- The primary care clinician (defined in the EHR or by the patient).
 - This option works well for practices that have limited nurse or staff support, rely on clinicians to make decisions, or do not use standing orders to promote care.
- Central office staff such as a unit clerk or nurse.
 - This option works well for practices whose clinicians have limited time for additional activities and who have advanced nursing and support staff who can enter or accept information into the EHR and act on standing orders.



Most IPHRs format the information, whether discrete values or a one page summary, to appear like a laboratory value or task for review and action. Potential actions in response to summary information include—

- Update or correct the patient's EHR record.
- Respond to specific services that are overdue.
 - Send the patient a referral for a service (e.g., mammogram).
 - Call the patient to discuss screening options (e.g., colon cancer screening method, breast cancer screening interval) and implement decision.
 - Arrange for a nursing visit to receive a service (e.g., immunization).
 - Contact a patient to schedule a wellness or chronic care visit.

Using an IPHR to deliver care

Make the IPHR the way your practice delivers wellness and chronic care. The IPHR can become a necessary tool for clinicians, staff, and patients. Examples of how to use an IPHR to deliver care include:

Use IPHR summaries at office visits. IPHR summaries provide a fast and easy way for clinicians and staff to identify overdue services and find out about patient's health behaviors. Prior to the clinician seeing a patient for a wellness or chronic care visit, a nurse can review the summary and initiate the delivery of services using standing orders such as administering overdue vaccines, starting referrals for services, and initiating health behavior counseling. When the clinician sees the patient, the clinician can also review the summary, reinforcing what the nurse initiated and delivering the remaining overdue services. During acute care visits, an IPHR summary can also allow for the quick identification of overdue services. These services can be delivered at the acute care visit or a separate visit can be scheduled if needed.

Encourage patients to use the IPHR to promote shared decisionmaking. If practices can encourage patients to use an IPHR prior to a wellness visit, the IPHR will highlight decisions that require shared or informed decisionmaking. It will then provide evidence-based educational material and decision aids. These materials can inform patients about service delivery options and allow them to participate in the decisionmaking process more meaningfully.

Supplement health behavior counseling with IPHR resources. Providing intensive health behavior counseling is challenging for practices. An IPHR can assist clinicians with health behavior counseling. Clinicians can initiate conversations about improving diet or exercise, losing weight, or quitting smoking and then refer patients to an IPHR for more detailed information. Clinicians can then follow up with patients to review the IPHR material, answer further questions, and check on the patient's progress with improving their health behaviors.

Direct patients to the IPHR to understand laboratory results. When informing patients of their laboratory results, clinicians and staff can refer patients to an IPHR. The IPHR can explain common preventive and chronic care results tailored to the patient's profile and link the patient to additional resources to make the information actionable.



Have patients use the IPHR to manage chronic conditions. Clinicians and staff can use the IPHR as an important resource to help patients better manage chronic conditions. In addition to the above functions, an IPHR can also—

- Help inform patients of treatment options for chronic conditions.
- Guide behavior change prior to initiating or changing a medication.
- Explain risks and benefits of medications.
- Help patients to understand the relationship between multiple chronic conditions and the patient's overall health.

Sustaining Use

Activities to sustain use of an IPHR begin with the go-live date and continue as long as a practice uses an IPHR. During the fourth and fifth learning collaboratives, members will need to work on short-term activities to sustain the use of an IPHR. During the sixth and seventh learning collaboratives, members will need to work on long-term activities to sustain the use of an IPHR.

Short-term activities to sustain the use of an IPHR. If the activities to engage patients and promote practice use of an IPHR are successful, these activities will serve to sustain use of the IPHR. Additional short-term strategies to sustain the use of an IPHR include—

- Continuing to provide feedback and benchmarking on both the number of patients engaged to use the IPHR and the impact on the delivery of preventive services.
- Leadership regularly reinforcing the importance and value of the IPHR.
- Setting a short-term office goal, then tracking and celebrating attainment of the goal.
- Identifying successful strategies and encouraging other clinicians and staff to adopt them.

Long-term activities to sustain the use of an IPHR. Sustained, long-term use of an IPHR requires continued attention. The goal is for both patient and practice use of the IPHR to become second nature, so that its use can facilitate the ultimate goal of improved delivery of care and well-being. Long-term strategies to sustain the use of an IPHR include—

- Ongoing monitoring of use and feedback.
- Making the IPHR's features part of the practice's mission.
- Incorporating the IPHR's functionalities into other practice initiatives such as being a patient-centered medical home.
- Using the IPHR to assist in meeting Meaningful Use criteria or participating in other payer initiatives.
- Promoting the IPHR as a means to differentiate your practice from other local practices.



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