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Coming to Terms

With

TERMINOLOGY

TERMS

EHR  PMS  EDR  HIT  EMR

Let’s talk about terminology for a moment. If you think you’re confused about the difference between EHR and EMR, just be glad you weren’t in the room when staff discussed which terminology to use in this manual! The acronyms you see above (and many, many more) will all be covered in the glossary section of the manual. Based on our staff and consultant discussions, however, for the purposes of this manual, we will refer to implementation of a PMS (practice management system) and EMR (electronic medical record). While much of the focus is on the more complex preparations for EMR implementation, we want to be clear that the Network is implementing both a new PMS and EMR, with the PMS rolling out first. We have tried to simplify the language by referring to one or both systems, or more generally referring to “this project”.
INCONCERTCARE AND IA/NEPCA
HEALTH INFORMATION TECHNOLOGY (HIT)
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For any outpatient health clinic, the decision to transition to an electronic medical record (EMR) is certainly one of the most significant changes in the career of most health care workers or the clinic. Aside from the obvious changes that immediately come to mind when an agency decides to go “paperless,” there are countless changes in work flow that are hard to even visualize prior to the project implementation. Throw a new practice management system into the mix and you can expect nothing less than chaos!

The key to successful implementation of an EMR is to visualize those workflow changes in the planning stage of EMR implementation and to create new work flow processes that are proven best practice. Our ultimate goal is to see clear improvements of the “old” work processes and patient flow because we have optimized utilization of the EMR. Implementation of optimally revised work processes may not be the only key element to successful electronic medical record implementation, but it is the unrecognized and often avoided key that so many health care agencies do not address. Too many clinics bringing in EMR with the best of intentions end up with genuinely frustrated health care staff and leadership -- in a season of a clinic’s growth that should by all rights feel like a time of celebration!

We are here to provide: motivation, a time line, direction and support to help you anticipate and address these work flow changes now, before they can trip you up in your implementation phase.

THE MOST IMPORTANT THING WE CAN DO IMMEDIATELY IS TO START CHANGING OUR MIND SET – RIGHT NOW, AND ON A DAILY BASIS. Think about what processes already need improvement in our current practice. How could they be improved? Extend our imaginations into our everyday work tasks to visualize how we would handle certain tasks without a paper chart, but instead by entering data and documentation into a laptop or desktop computer. This is our opportunity to improve our practice by:

- Ensuring accuracy,
- Ensuring completion and
- Developing efficient and client friendly patient care systems.
We want to be clear with you that this process of changing your entire clinic workflow is very hard work. It is also time consuming. However, lack of attention to this key area is the primary reason that 75% of EMR implementations FAIL. We are here to help you succeed!

If this feels at all overwhelming, please remember that the mission and purpose of the Iowa Nebraska Primary Care Association (IA/NEPCA) and INConcertCare (INCC) is to provide professional support and assistance to you whenever possible. We are here to help!

The IA/NEPCA and INCC Staff HIT Implementation Team:

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The Network HIT Implementation Steering Committee:

This committee will set the direction for HIT implementation across the Network, providing feedback and recommendations on planning, implementation, and rollout plans as the process evolves. This cross-discipline committee represents the various perspectives involved in planning and implementing an EMR at the health center level; but, it will address these issues from the Network perspective as well.

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**PLEASE NOTE:** This manual is intended to be read and used by all staff members at all participating centers. The first part of the manual (Section I, Parts A through D) are background information. This information is essential in conveying a retrospective of the planning and building of infrastructure for this project which has already occurred and to provide background and rationale for the rest of the manual.

While the early parts are important background reading for the reader to understand the enormity of the project which is being undertaken, *it does not primarily address the implementation process at the center level*. Beginning with Section I, Part E, “Getting Started” the centers’ staff and leaders are integrated into the process; process and operational steps address the work each center will undertake in order to have a successful implementation within their own agency.
INCONCERTCARE AND IA/NEPCA
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SECTION I: PRELIMINARY PLANNING KEY POINTS

1. PMS implementation precedes EMR implementation by at least six months. The new PMS system should be allowed to function for at least three months, or a whole revenue cycle, before it is replicated at another site. Because the implementation processes are so functionally similar, the PMS project is an excellent practice “drill” for the larger project yet to come. Readers are encouraged to read through the entire manual at least once before beginning the PMS implementation process to understand the detail and support information.

2. A multi-level, multi-disciplinary center-based Network Steering Committee for HIT implementation will drive the centers through the Network work plan and time line, and make recommendations to the Board regarding key decisions, such as standardization issues.

3. The Network HIT Steering Committee will create a set of ground rules, and a list of goals and objectives to reach that will drive the project implementation process.

4. The Network HIT Steering Committee will ensure that all meeting agendas, minutes, action steps, accountability, dates due, and completed tasks are documented, along with work plan and budget information.

5. The Network HIT Implementation Steering Committee will create and approve a communications plan that will facilitate optimal staff input, discussion, and successful implementation.

6. All centers must complete a readiness assessment for EMR implementation. Discuss any apparent concerns or needs within your group; or bring to the Network if unable to resolve internally.

7. All centers will complete the “Planning Information/Needs Assessment” for costing and budgeting at the Network level. Also make notes or create a diagram demonstrating where you think the hardware will be placed and where you may need power or connection sources.

8. Keep in mind that the entire process generally takes one to two years. Although this is a well-known and widely experienced reality, it becomes personal to the organization
when pulling together timelines and implementation plans. The first step after creating clear goals is to identify milestones, and realistic dates by which these milestones can be achieved.

9. All centers must have thorough discussions with their Board of Directors, with absolute transparency, and ensure the Board’s support in moving forward with the implementation.

10. Center leadership, with the assistance of the Network HIT Steering Committee, will ensure that all staff members have been involved in discussion regarding the project implementation. All disciplines and levels should be represented either in the Network HIT Steering Committee or on a Center Implementation Team.
SECTION I:

PRELIMINARY PLANNING

OVERVIEW OF HEALTH INFORMATION TECHNOLOGY (HIT)

HIT (Health Information Technology) is the use of computer applications to record, store, protect, retrieve, and transfer clinical, administrative, and financial information electronically within health care settings. The ultimate goal of HIT is to improve the quality and efficiency of patient care.

Recent research demonstrates that increased use of information technology is an important step in improving quality of care and patient safety. The recent focus on HIT adoption was jump-started by the Institutes of Medicine 1999 report on patient safety entitled, To Err is Human: Building a Safer Health System, which highlighted improved use of computerized applications as a core strategy for improving safety and quality of the health care system. The Agency for Health Research and Quality (AHRQ) funded the National Resource Center for Health IT (NRC) in 2004 and approximately $166 million in HIT projects throughout the United States. HRSA has supported the health centers, other safety net providers, and ambulatory care providers' adoption of HIT since the 1980s through various grant programs ranging from operational funding to funding that is dedicated to HIT implementation.

Despite its potential advantages for efficiency and quality, the adoption of HIT has proceeded slowly, particularly among health centers, other safety net providers and ambulatory care providers, as documented by a recent publication of the National Association of Community Health Centers, Electronic Health Information Among Community Health Centers: Adoption and Barriers. Reasons for this include lack of skilled resources, budget constraints, poor project management, and the challenges associated with change management.

The Health Resources and Services Administration (HRSA) and its Office of Health Information Technology (OHIT) have begun to play a unique and critical role in the national strategy for HIT. HRSA’s vision is to leverage the power of HIT to improve patient outcomes, quality, and reduce health disparities for people who are uninsured, isolated, or medically vulnerable. As part of their mission, they aim to provide health centers, other safety net providers, and ambulatory care providers with tools to successfully implement HIT in a manner appropriate for their and their patients' needs and abilities. The compilation of their work served as a major resource for this manual. In addition, OHIT has initiated an HIT Technical Assistance Center to support grantees that use HRSA HIT resources, or who are otherwise engaged in HIT implementation.
Over the last few years the United States Government has taken increasing interest in promoting national adoption. In 2004, President Bush announced the creation of a new Office of the National Coordinator for Health IT (ONC) in his State of the Union Address, calling for the widespread use of Electronic Health Records by 2014. Among the initiatives directed or coordinated by ONC are the National Health Information Network (NHIN), the Certification Commission for Health IT (CCHIT), which has the purpose of certifying HIT products, and the American Health Information Community (AHIC) developed to discuss and generate recommendations on key topic areas.

The two basic components of HIT addressed in this manual are the practice management system (PMS) and electronic medical record (EMR). The basic functions of each are described below.

**PMS Systems**

- Patient Demographics
- Insurance Verification
- Appointment Scheduling
- Claims and Statements
- Reporting

**EMR Systems**

- Health Information and Data
- Results Management
- Order/Entry Management
- Reporting and Population Management
- Electronic Communication and Connectivity
- Patient Support
- Decision Support
- E-Prescribing
- Interoperability
- Federal, State, Local & Grant Reporting
A. PRACTICE MANAGEMENT SYSTEM (PMS)

1. BACKGROUND -- PMSs are software systems that support administrative workflow in medical clinics. Administrative and support staff use them to manage patients’ demographics and insurance information, arrange appointments, support billing and collections, and track the practice’s productivity and financials status. Federally qualified health centers (FQHCs) and rural health clinics have some distinct differences in their operations and practice management, and therefore in their PMS needs. Along with being non-profit, they often have multiple public and private funding sources. While these factors can bring additional benefits, they also bring along greater oversight from federal and state funding, as well as other private grant funding sources.

FQHCs provide a wider range of services than do traditional private practices, given their mission to meet the broader health care needs of the underserved. For example, an FQHC may provide adult primary, pediatric, prenatal, behavioral health, and HIV-related care as well as dentistry, podiatry, and ophthalmology/optometry services. Because they do receive public funding and a favorable tax status, they must file annual reports to government agencies and other funders.

Changes in health care delivery, reimbursement, and health information technology (HIT) are prompting many centers to reassess their PMS. Many clinics are planning to implement an electronic medical record (EMR) and are looking for a PMS that will most smoothly integrate with it, so they can purchase the two together.

2. HOW FQHCs NEEDS ARE DIFFERENT -- Here are some of the tasks that are different for an FQHC than for a typical for-profit clinic:

   a. Registration: Reports submitted to federal and state agencies must include certain socioeconomic data that other health care providers typically do not record. Additionally, state and federal agencies frequently change their data requirements. PMSs must be able to store the currently required data and, ideally, enforce the recording of this data during patient registration.

   b. Scheduling: FQHCs are more likely than private physician practices to offer group visits for prenatal counseling, behavioral health care, and social-support services. Consequently, their PMS must be able to schedule group visits.

   c. Patient check-in: Because FQHCs provide a wider range of services the check-in process generates appropriate documentation for a variety of visit types ranging from
adult medical care to prenatal care and vision care. This means their PMS must be able to print customized patient-specific and visit-specific super bills.

d. **Pre-Visit Insurance Coverage Verification Process:** Ideally, this can be done in an automated batch each afternoon for the next day’s appointments. This can facilitate a much smoother check-in.

e. **Charge entry and claim/bill generation:** The billing process accounts for the greatest differences and idiosyncrasies of the FQHC administrative processes. These processes include the following:
  
  - Federal sliding fee billing
  - Split billing between two payers
  - Roll-up billing, or “bundling”
  - Payer-specific edit checks: (for example, Medicare Part B reimburses FQHCs for physical exams for Medicare beneficiaries; other providers are not reimbursed for these. Clinic PMSs should accommodate specialized edit checks to catch errors or omissions in the claim that may prevent or delay insurance payments.)
  - Dental billing: Although the administrative work flow for dental visits is similar to that for medical encounters, there are different coding systems for documenting dental diagnoses and procedures, and different rules and requirements for submitting correct dental claims.
  - Payment posting: Although bundled claims are billed and paid as a single charge, payments must be posted such that the proportion of payment for each service is specified. The PMS must support this function.
  - Reporting: FQHCs must file a variety of reports documenting the population they served and the services rendered. They may also have to submit reports to certain grant agencies to account for funds received, substantiating that they were used appropriately. Clinics’ PMSs must have the built-in capability to produce the reports or to support custom report writing – in other words, they should be “end-user friendly.”

3. **Upgrade Considerations and Recommendations**

a. Patient demographic and insurance data must be moved to the new system. Prior to this, determination must be made as to what category or span of patients’ data will be entered into the system prior to the patient’s return. Because many FQHCs cannot move claims data to the new PMS, they operate both the old and new systems in parallel (and consolidate all reporting) until outstanding claims and patient balances are paid.
b. Many organizations cannot move scheduling data to the new system, so they must operate both the old and new systems for awhile.

c. All existing interfaces must be recreated and re-implemented.

d. Staff must be retrained, and, in some cases, administrative workflows must be modified according to the new system’s capabilities (e.g. a new system that offers better integration of front-office and back-office functions may require that scheduling staff be retrained to check outstanding patient balances at the time of appointment scheduling).

e. A newer, more complex PMS may require additional information technology (IT) support to maintain it.

4. PMS and the Growth of FQHCs

FQHCs play a critical role in health care, and practice management systems play an important role in the operation and management of FQHCs. New developments in health information technology and health care administration trends have created opportunities for FQHCs to improve efficiency and quality at a rapid pace. However, to fully leverage these opportunities, FQHCs must have a modern PMS that can integrate effectively with electronic medical records while meeting HIPAA transaction standards, and/or support the outsourcing of billing and HIT maintenance. Although upgrading a PMS can entail significant expense and effort, FQHCs should strongly consider the benefits and costs of purchasing or upgrading if they do not have an up-to-date system.

Key considerations, including support for billing and reporting, support for outsourced billing, electronic data exchange, and EMR integration are an appropriate starting point in determining the need to upgrade, and how to negotiate with the vendor to best meet the center or network’s specific service needs.

5. Implementation of a New or Upgraded PMS

It has been said that implementation of a new or upgraded PMS is like a miniature “dress rehearsal” for the implementation of the EMR that will follow. The major steps of the process are the same as with the EMR; the work plan simply pertains to the data, tasks, and procedures that regularly occur in the management of the practice.

The sections that follow are written primarily with language that addresses the implementation of EMR. It is recommended that this entire manual is read, discussed, and absorbed before the action stages of implementation are initiated. Although the implementation of PMS clearly comes before implementation of EMR (by an average of about six months or so), the implications of the EMR must always be under consideration as decisions are made about the implementation of PMS.
For the entire patient flow and practice management to function efficiently, accurately, and with a constant foundation of exceptional customer service (anticipating and exceeding the patient’s needs and desires), the PMS must be functionally integrated with the EMR. The “front” needs to be integrated with the “back.” The areas must become as one functional area, with one mutual vision and purpose. For this ideal metaphor to become a reality it must begin with the first steps of PMS implementation. Some key decisions must be agreed upon before the work plan for PMS is designed (for example, levels of standardization in identified functional areas).

Every step, small or large, must ultimately lead to the agreed upon vision of integration, standardization, and communication as described above. Every decision for PMS must be congruent with the plans for the EMR; areas of standardization in the EMR may be initiated or supported through consistent systems planning in PMS, and vice versa.

The work plan should ultimately look like a simpler, shorter model of the EMR work plan. It may provide experiences that lead to lessons learned prior to EMR implementation. It is a real and live opportunity to practice consistent and positive implementation of the communication plans, as well as to successfully carry out congruous and cohesive elements of well-conceived project management plans. As the details of the project implementation are read and studied, they may be somewhat simplified and easier to get one’s mind around if they are considered in the context of the PMS implementation.

As the later sections on EMR explain, some of the most challenging aspects of a network level HIT implementation include:

6. Workflow Analysis
Make a comprehensive list of every single practice management process – even the tiniest one, such as answering the phone to scheduling an appointment. Use the resources in this manual’s EMR Section III to map out the current work flow process. The work flow analysis, called “A Systems Approach to Operational Redesign” provided as a link within this manual, offers detailed instructions:


A variety of examples are included in Section III because each will work better for some than others. Look at each process with a fresh but critical eye. After ample discussion to determine the ideal process, identify step by step the simplest way to accomplish the task. Keep in mind that for a period of time, you will be using the PMS exclusively, then
adding the EMR (probably one component at a time), while still utilizing the paper chart also. Try mapping out the steps that will be required to do this as simply and efficiently as possible. Then troubleshoot: Where are the holes in the process? What can/will go wrong? What are we missing here? It often takes several tries to get to the “right” answer. Even that will likely change and evolve once the process is actually being performed.

a. Data Conversion
- One of the biggest project elements involved in planning for PMS implementation is data conversion. Along with an opportunity to clean up the data storage, the determination of what data fields to download into the new system is paramount. The HIT Implementation Steering Committee, along with the center level Implementation Teams, will spend a great deal of time and energy working through all of the questions and issues that are raised in this process.
  - It is generally recommended that PMS data conversion be limited to basic demographics. Anything beyond that is often found to be prone to errors.
- Employees that are the most familiar with the identified current work processes (e.g. coding and billing) will be looked to and relied upon for conveying the requirements of the process at hand: what has worked and what has not; what could be done (or not done) that has never before even been considered; and what is realistic and what is not.

b. Placement of Devices
- Much of the hardware that is purchased with an EMR in mind will first be utilized for PMS. Placement at the time of PMS implementation is critical; it must work well now, and it must work well when the EMR is up and running.

c. Applications Testing
- There will be applications testing by IT and project staff before real-time use in actual patient visits to ensure that all processes and links are working as intended. Mock visits are often used to test out the systems. Each application is then signed off by a qualified individual before it begins to be utilized with real patients and real staff.

d. Staff Training
- The same steps will be taken as in the EMR in terms of training all staff: first, basic computer training must occur to ensure adequate skills; second, training (and training and training) for all the tasks, processes, data entry, data collection, communications, and reporting that is part of the normal work day.
Again, all staff members are encouraged to read and study this entire manual before actively participating in the planning and implementation of the PMS. Much of the HIT background, rationale, context, and detail are clearly stated in the EMR portion of the manual. It has been placed there because the EMR implementation is a much bigger and more complex project which more directly impacts direct patient care. Nonetheless, the importance of an efficient, clinic-appropriate PMS should never be minimized as anything less than critical to a well-integrated, patient-focused FQHC. It is integral to the clinic’s operations and the overall care and experience of the patient in what is being painstakingly and very carefully designed: our patients’ medical home where they receive affordable, preventative, holistic, and individualized care – care that anticipates and exceeds their needs and desires.

**Key Point:** PMS implementation precedes EMR implementation by at least six months. The new PMS system should be allowed to function for at least three months, or a whole revenue cycle, before it is replicated at another site. Because the implementation processes are so functionally similar, the PMS project is an excellent practice “drill” for the larger project yet to come. Readers are encouraged to read through the entire manual at least once before participating in the PMS implementation process, as much of the detail and support information is in the EMR section.
C. PROJECT MANAGEMENT AND OVERSIGHT

As with all complex projects, adopting EMR requires a serious approach to project management and oversight. In addition to knowing what you want from your project and identifying and procuring the resources you need to achieve your objectives, developing and sticking to a project plan is critical. This section focuses on the project implementation plan developed by INCC and also on establishing effective communication, selecting project management tools, and documenting project activities.

1. INCC has assembled a multi-disciplinary, multi-level center-based **INCC NETWORK HIT STEERING COMMITTEE** to assist with the critical decisions and support measures that will affect the entire Network. This committee will meet regularly to guide the process of planning the project implementation. The committee is designed to work with transparency; therefore a thorough communication plan will be utilized with each significant decision made.

   a. A significant initial role for the Network HIT Steering Committee is to **establish the role and structure of the committee** and to **identify some “ground rules”** (e.g. “Interruptions are not appropriate” or “No thought or idea is considered ‘stupid’ in this committee”).

   b. The Steering Committee will also discuss and put into writing what the vision is: what success will look like and how it will be measured. It is appropriate to have a **Mission Statement or a vision, goals and objectives, and action steps** to guide the way. This document will give the committee a point of reference and a sense of priority when tough decisions need to be made, or when there is tension within the committee.

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**Key Point:** A multi-level, multi-disciplinary Network HIT Steering Committee will guide the centers through the Network work plan and timeline, and make recommendations to the Board regarding key decisions, such as standardization issues. The Network HIT Steering Committee will create a set of ground rules and a list of goals and objectives that will drive the project implementation process.

2. Similarly, each health center is creating a **CENTER IMPLEMENTATION TEAM** that will answer questions and resolve issues that are specific to each center. These committee members will be gathering information from the clinic staff that does the actual work with these tasks on a daily basis, to ensure that the EMR improves each process, and never complicates it. See Section II for the important tasks set before these teams comprised of multidisciplinary center staff.
3. The Network Steering Committee will also assemble and work with smaller **Specialty Sub-Committees** that are experienced in certain aspects of clinic workflow. These sub-committees will work on analyzing the more specialized work processes that occur on a regular basis in the clinics and how to integrate them into the EMR. These committees will work together to establish the degree of standardization to which the Board and Steering Committee have committed. Standardization of the EMR templates and operational processes to the greatest degree that it is effective is essential to optimizing the benefits of the EMR.

4. **Additional Staffing for HIT** -- INConcertCare will also be hiring a full-time HIT Project Manager and a Network Technician.

There will be more information on HIT committees and teams in the next section.

5. **Documentation of Project Implementation**

Good documentation is very important in ensuring that a project remains well-managed and organized. Once the implementation has started, the Steering Committee will be involved in regular meetings with additional workgroups formed as needed. All meetings must be well-documented with a summary list of action items, each of which has a due date and a primary accountable individual. These meeting minutes should be shared with all meeting participants in a timely manner after the meeting so that discrepancies or unresolved topics can be resolved. Excellent documentation is essential for consistent and reliable communication with center staff.

The Network Steering Committee’s timeline and work plan should be consistently utilized for documentation and analysis of progress. It is best to keep all information rather than risk not keeping one thing that may be needed at a later date.

In addition, the Steering Committee should regularly provide status updates to senior leadership to ensure that they remain well-informed on the progress of the project and are informed in a timely manner if there are any changes to the schedule and/or scope of implementation. The Steering Committee will also need to regularly update the project plan to show activities that have been completed, new tasks that have been identified, and any changes in task schedule. Budget information also needs to be documented and kept current.

Finally, the Steering Committee should also document all risks that are identified and develop plans for how these risks will be mitigated. This will be done by a Risk Management Sub-Committee. The resulting risk management plan will also be shared with senior leadership.
Each of these activities should be assigned to a specific individual on the committee who is accountable for ensuring that the activity is completed by an identified date.

**Key Point:** Network HIT Steering Committee will ensure that all meeting agendas, minutes, action steps, accountability, dates due, and completed tasks are documented, along with work plan and budget information.

6. **Identification, Tracking, and Resolution of Unanticipated Factors**

As part of system implementation and testing, new issues will be uncovered. It is important that all issues are carefully recorded and a priority status assigned to each of them. Oftentimes, these unanticipated issues may be critical. Unless they are resolved, the application “go-live” maybe impacted. In some instances, other issues may be higher in priority and the organization may decide that it would be better to address the lesser of the two issues at a later time.

There are a number of different tools that can be used to track issues, from a simple Microsoft Excel document to commonly used open source tools. Two specific tools which are fully customizable and originally focused on software development cycle bug tracking are:

- **Open Ticket**
  - A simple, basic open-sourced trouble-ticketing system
  - SQL backend, based on Zope web application server technology
  - A basic but functional system, which allows users to create tickets with various priorities and assign them to a team
  - Includes a simple ticket search interface
  - Problem types and status are fully configurable
  - No security mechanism
  - Has some ability to track time spent on a problem report

- **Bugzilla**
  - A "Defect Tracking System" or "Bug-Tracking System." Defect Tracking Systems allow individual or groups of developers to keep track of outstanding defects in their product effectively.
  - A third option is to create a simple table or spreadsheet on a shared drive that can be used to list unfinished tasks and who is accountable. Dates should be included to ensure that action is being taken on a regular basis.
D. FOCUS ON COMMUNICATION

1. DEVELOPING AND EXECUTING A COMMUNICATION PLAN

An essential component to effective management and oversight for HIT adoptions is a well-thought-out and executed communications plan. Another of the Steering Committee’s early objectives is to create this communication plan in writing, to define the criteria described above, and to work well within the Network environment and the centers for which it is designed.

a. The communication plan should be simple and clear.

b. It may define the specific details of what information will be disseminated, how often, to what groups of people, and the instructions to that level of staff of how and when to share what information to the staff that they supervise.

c. The plan may also define the criteria for what decisions should be made by the committee, what decisions should be made by subcommittees or presented to staff members, and what decisions should be center-specific. Some of this may have to be determined as the situations arise, but communication must always be included in the discussion of important decisions or changes.

d. The plan should also identify multiple ways that the staff may have input (sub-committees, center committees, email, phone, suggestion boxes, etc.). Utilization of surveys, potentially using a program such as “Survey Monkey,” will encourage staff to use their computers and assure them that their input is truly desired.

e. The Network HIT Implementation Steering Committee may want to discuss what decisions are not open to staff input and be diligent in not requesting input when a decision is ultimately not open to staff input.

Key Point: Network HIT Implementation Steering Committee will create and approve a communications plan that will facilitate optimal staff input, discussion, and successful implementation.

2. ENSURING THAT COMMUNICATION REMAINS A TOP PRIORITY

a. Maintaining buy-in among clinical and administrative leadership as well as users on the front-line is critical to preventing projects from being delayed due to policy decisions, financial reasons, or user resistance. Without regular, open communications between the key stakeholders we cannot assure that everyone is in agreement. Also, it is important to communicate effectively so that when the
inevitable challenges and delays do occur, there is broad understanding of the causative reasons and potential solutions.

b. Effective communication requires input from all levels and disciplines of the health centers, as they will be directly affected by the implementation of the HIT. Proactively seeking input and feedback from staff, and addressing it openly, is the best way to curtail staff resistance and “techno-phobia.” It is important to open up the lines of communication as soon as possible and to set up a plan where: 1) The Network HIT Implementation Steering Committee is committed and accountable for both providing regular updates, queries, and feedback to appropriate stakeholders, and 2) the staff is made aware of multiple ways to give feedback and input, and are assured that it is safe to offer feedback.

c. A diligent, consistent effort should be put forth to avoid “group think,” where decisions are made without challenges or discussion. There will likely be individuals in the group who have diverse thoughts, but will be afraid she or he is alone in his or her beliefs, or that his or her ideas are not worthwhile. Every effort should be put forth to assure that each person’s input is heard and valued.

d. Some of the messages that can be communicated clearly and often include:

- Perceived usefulness of the HIT: Staff must understand the benefits to their health center and to their ability to deliver quality patient care
- Perceived and communicated user satisfaction: Management must convey realistic and positive expectations about the HIT
- Perceived ability to facilitate usability of the system in areas where staff can have real and practical input: these areas include functionalities, templates, screen layout, and user interface

e. Expected concerns that may be verbalized by staff include:

- Fear of job loss (self or co-workers)
- Decreased access to patient information, compared to paper chart access
- Decreased access for patients to clinic services, due to complications during implementation
- Fear of making mistakes, looking un-intelligent, and not knowing how to fix errors (in front of patients, co-workers, or supervisors)
- Major changes in daily work patterns and responsibilities
- Disruption of patient care due to “modern technology”
3. ** ADDRESSING CONCERNS REALISTICALLY AND HONESTLY**

   a. Reassure staff that learning curves are normal, people have a variety of reactions to change, and that these concerns are natural under the circumstances

   b. Assist with creating processes in the transition period so that staff does not have to struggle through new processes in the patient’s presence

   c. Address real issues and concerns with genuine caring and provide a response to concerns in a timely manner
E. GETTING STARTED AT EACH CENTER

Beginning an HIT initiative is a major undertaking for most health centers and safety net and ambulatory care providers. As centers embark upon a HIT project, key considerations include identifying the overall HIT strategy, the goals and objectives of the project, center readiness, and overall feasibility. From the Network perspective, standardization of data collection, documentation, and other aspects of system design will be ongoing considerations throughout the planning and implementation process. The purpose of this section is to guide the Network and individual centers through these decision making processes.

1. CLARIFYING GOALS AND OBJECTIVES

a. It is crucial to understand from the beginning of implementation what your center hopes to gain from health IT adoption. One of the first major activities of the Center Implementation Team will be to determine a list of essential goals and objectives that should be achieved as a result of this project implementation. We believe asking and answering the following questions is critical.

- What business needs does this project satisfy?

As with any major network or association project, in the planning phase each individual center should critically assess what is driving the implementation of the project. What are we looking to gain from this implementation, and what needs or gaps will it fill?

- Is clinical system implementation part of the strategic plan for your center?

Is implementation of the EMR already in your strategic plan? Will the Network’s involvement help to alleviate some of the barriers or concerns you have? What new barriers or concerns does the network proposal present to your center at this time?

- What specific problems are we trying to solve as a center, network, and association? Frequently, centers may embark on a technology initiative to address a specific problem. For example, a bar-coded medication administration system could be installed to reduce medication-related errors. Understanding the root cause of process problems is important. Oftentimes, if problems arise as a result of broken processes, it is unlikely that the installation of a new information system will rectify that problem. Technology
should be seen as an enabler and not a panacea. New technology will work well when operational processes work well. An EMR cannot fix processes that are not working.

It is recommended that both the Network HIT Implementation Steering Committee and the Center Implementation Teams take on the task of identifying their respective lists of priority goals and essential outcomes at the beginning of this project. This task can be a very positive, team building initiative that will start to make the groups a cohesive, integrated, effective force to direct the project within the network. The task does not have to be complex or take hours to complete. The simple presence of goals and objectives can help provide direction and unity when difficult decisions are later encountered. This process that evolves throughout the Network Steering Committee’s work will likely occur within the center level teams as well.

2. **FOCUSING ON THE CENTRAL OBJECTIVE: IMPROVING THE QUALITY OF CARE**

While there may be many reasons to adopt HIT, the most important one -- especially for community health centers -- is to improve the quality of care that can be accessed by low income and uninsured individuals. With this EMR implementation manual, we are assuming that the primary reason for HIT adoption is overall improvements of the quality of care delivered by health centers, other safety nets providers, and ambulatory care providers. In particular, HIT applications such as disease registries and electronic medical records have been demonstrated to facilitate improvements in care delivered, particularly to individuals with chronic illness who are disproportionately represented among health center patients. In developing and prioritizing "wants" and “needs” for HIT adoption, it is important to consider how the changes that are contemplated will ultimately improve the quality and efficiency of care that is delivered.

From the onset of planning, the design of the EMR must be developed to enhance collection of all required data that is, or may likely be, needed for reporting purposes or for evaluation of patient care and performance improvement.
3. **PERFORMING A READINESS ASSESSMENT FOR YOUR CENTER**

When choosing whether or what to implement, administrators should have a sense of what their current environment looks like from a readiness perspective. Several tools to assess readiness exist and can be used to help answer these questions. By completing a readiness assessment a center will take a major step in identifying where current gaps exist and what needs to be done to close those gaps. Several of these tools ask you to describe characteristics of your organization including culture, leadership models, staff aptitude with computer applications, existing resources and IT infrastructure to help guide your decisions regarding next steps. We have included the tool that IA/NEPCA used to help your center to determine its readiness for EMR implementation. Please see Appendix I.1 at the end of this section.

**ACTION STEP (All Centers):** All centers must complete a readiness assessment (Appendix I-1) for EMR implementation. Discuss any apparent concerns or needs within your group, or bring them to the Network if unable to resolve internally.

4. **ENSURING COMPLIANCE WITH PRIVACY REGULATIONS**

Most health care providers are well aware of regulatory and accreditation requirements associated with providing health care. It is important that you consider continued compliance with privacy and security as a priority at the start of any health IT project. In particular, the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and its associated rules must be taken into account. Please feel free to use the link that follows for more specific information on HIPAA regulations in our health care environment:

[HIPAA Administrative Simplification: Toolbox for Small Group and Safety-Net Providers (PDF - 472kb)]

There will be more resources on this topic provided in Section II.E.

5. **COMPLETING YOUR CENTER’S INVENTORY AND NEEDS ASSESSMENT**

As part of the process of an EMR implementation, health centers must make detailed plans for infrastructure upgrades. A useful starting point is completing a technology inventory of the systems currently in place at each individual site. When evaluating the current infrastructure, a complete assessment of the following core components should be completed: 1) network, 2) servers, 3) desktop PCs, and 4) peripheral devices like printers and fax machines. Many new clinical systems today require specific server and PC configurations. By reviewing the vendor specifications for their software (once selected), a
plan can be developed for the exact infrastructure upgrades that will be required. In Appendix I-2 at the end of this section you will find the form template that INCC is utilizing to take initial inventory of the centers’ computer-related equipment.

6. **IDENTIFYING DEVICE LOCATIONS**

As you are completing your “Planning Information/Needs Assessment” form, work as a team within your center to determine locations for your new hardware and electronic devices. At this point, it will be a high-level determination and may well be revised when you look at work-flow and process changes. Do, however, make note of where you think at this point in time your hardware and devices will be located.

**Key Point: (All Centers):** All centers will complete the “Planning Information/Needs Assessment” for costing and budgeting at the network level. Also make notes or create a diagram demonstrating where you think the hardware will be placed and where you may need power or connection sources.

7. **CREATING TIMELINES: YOUR CENTER AND YOUR NETWORK**

Consider the very early processes your center began with: the first steps of determining feasibility, identifying potential funding sources, and working with the Board for consensus in order to even begin the process. Consider the length of time needed for vendor selection, especially in the Network environment with multiple centers and exponentially numerous needs. Consider the process of establishing a cohesive steering committee which understands the goals and the significant layers of its mission. Consider the dedication of the committee members in developing the rapport and trust needed to make difficult decisions.

There are also the center level implementation teams, the specialty committees, the selection and purchase of hardware, the actual placement and installation, and the changes in process and procedure that must be analyzed, documented, communicated, and taught. The implementation project is a monumental one that must be done extremely well in order to truly facilitate the reality of our mission and visions for patient care.

a. While there are several resources available that provide templates for developing project plans for HIT implementation, it is important that the development of the plan be a team exercise that is specific to the group of people with primary responsibility for guiding the process for the project implementation. At the Network level, this is the IA/NEPCA and
INConcertCare HIT Steering Committee. Additionally, you will be creating your own work plan for implementation within your own center. This, too, will involve a multidisciplinary steering committee from within your own staff. We have attached the INCC PMS/EMR Implementation Time and Action Calendar at the end of this section (Appendix I.3). Although the timelines and “deadlines” are necessarily fluid because of the complexity of our Network and funding, this is an excellent tool for documentation of completed tasks and chronology of steps.

b. We have also attached a template of a simpler project timeline which may work well as a basis for the implementation timeline in your center (I.4). Resources for your work plan may include information from the INCC timeline and work plan, the action steps in this manual, and even utilizing the headings in this manual.

c. A good first step is to review goals and objectives the Steering Committee identified for the project and begin to list out the various components of work that must occur to meet those objectives. In the context of rolling out a specific application like an electronic medical record, these components or "activity blocks" may include team development, communications within the organization, workflow mapping, handling of existing data, training, upgrading hardware, vendor procurement, customization, systems testing, go-live planning, and contingency planning. The steps are practical: so look beyond variance in terminology and utilize project management steps that may have worked for you in the past.

Vendors often provide limited project plans that will cover the application implementation and training components of the project. The vendor-supplied project plans often need to be augmented to include all aspects of the project, for example, the time taken for workflow and process mapping, infrastructure upgrades or changes to the existing environment to support new hardware. The exact scope and nature of these components will differ depending on the goals of our implementation; however, it is useful to review some generic guides and sample plans to get a sense of the areas that you should incorporate.

**Key Point:** Keep in mind that the entire process generally takes one to two years. Although this is a well-known and widely experienced reality, it becomes personal to the organization when pulling together timelines and implementation plans. The first step after creating clear goals is to identify milestones and realistic dates by which these milestones can be achieved.
8. **Constructing Realistic Financial Projections**

a. The adoption of an EMR is a challenging and complicated undertaking for any provider office, and especially for a FQHC. It is important to realize that many of the benefits may not be directly financial. This is largely due to the unique financial structure of the health care safety net, including limited revenue sources, challenging patient populations, and variable government reimbursement rates.

b. Key considerations include these facts:
   - A clear positive return on investment may be difficult to demonstrate. The financial costs of operating and maintaining an EMR are ongoing.
   - Upfront costs can be high, and the resources required to sustain the EMR long-term are significant.

c. Examples of costs that will be incurred include:
   - Purchase and installation of IT network and hardware, including servers, PCs/thin clients, printers, scanners and routers
   - Purchase of the initial software and supporting applications
   - Use of external consultants
   - Training clinic staff
   - Purchase and/or construction of interfaces that make the EMR more productive (lab, pharmacy, hospital)
   - Hiring additional IT staff
   - Lost productivity during implementation

d. Capital costs remain the most significant barrier to adoption for FQHCs. Consequently, centers -- with the support of the Network -- need to identify potential funding sources to pay for initial start-up costs and, ideally, also for long-term operating and maintenance costs.

An important reality for the centers, as well as the Network, to fully comprehend is that while the gain in cost efficiencies accrue to the health center, the costs will continue to accrue at the Network level. The ongoing funding of the Network will be a continued financial consideration for centers, specifically compensation for the ongoing costs of the Network system.

e. The benefits of EMR implementation, once funding is identified, will likely occur in improvement in quality of patient care rather than in net financial savings. For example:
   - Improved operational efficiencies
   - Reduction in transcription costs, office supplies and services
• Ability to access real time patient information from multiple locations
• Space efficiencies
• Automated standard reporting data that is required by government agencies and funders
• Reduced administrative staff time
• Enhanced reporting capability and quality improvement measurements
• Improved claims processing
• Improved recruitment and retention of providers
• Elimination of misplaced or lost charts
• Improved prescription management
• Improved population based care

f. Please refer to the Network budgeting process and spreadsheets for integration into your own center’s budget. These have been provided to each center’s Executive Director and are also located at INCC.
**EMR Savings to Consider:**

- **Cost Reduction**
  - Reduced transcription costs
  - Reduced internal and external copying expenses
  - Labor savings
  - Malpractice insurance savings
  - Lower paper chart and storage expense
  - Reduced paper office supply costs (paper, chart materials, prescription pads, etc.)
  - Postage

- **Revenue Enhancement**
  - Increase in health maintenance services
  - Improved coding accuracy
  - Increase in the number of visits per day
  - Increase in the amount of revenue-generating space (if the medical records area is used for something else)

- **Improved Administrative Efficiency**
  - Fewer chart pulls and less filing
  - Universal access to charts
  - Reduction in phone tag
  - Improved intra-office communication
  - Fewer call-backs from pharmacies
  - Easier compliance with chart requests and chart audits

- **Improved Clinical Efficiency, Patient Care and Service**
  - Higher quality documentation
  - Built-in protocols and reminders
  - Improved medication management
  - More efficient use of RN, LPN and MA time, as opposed to provider time
  - More efficient signing of charts
  - Patient call-backs and telephone triage
  - Patient education and involvement
  - Electronic clinical decision support
  - Preventive care maintenance tracking
  - Peer review efficiency
  - Enhanced disease management
9. **HAVING ONGOING CONVERSATIONS WITH KEY STAKEHOLDERS**

Important factors for success in the implementation of clinical applications such as EMRs include the early involvement of all the stakeholders and sponsorship from senior leadership throughout the course of the project. Working to achieve stakeholder buy-in and demonstrating the potential value of the system to leadership early on is essential to a successful implementation. The unique benefits of the system to each stakeholder need to well-explained and understood.

Prior to any HIT implementation, in addition to getting administration and leadership on board, it is critical to connect with every single person whose work will be affected by the new technology. Ideally, each key constituency -- such as physicians, nurses, medical assistants, client administrative staff, and others who will eventually need to interact with the system -- should be involved in identifying requirements and designing the system and processes. This approach is likely to optimize the system usefulness and adoption. It is important that individuals understand up-front how the system may affect their work, as well as the benefits of moving to a new clinical system.

Key stakeholders that must be involved from the earliest planning include:

- **Senior leadership (CEO, CFO, COO, CMO)** - Engaging senior leadership early in the implementation process is a critical component of a major practice management and electronic medical record implementation. It is important to ensure that senior leadership has a clear understanding of the potential costs and benefits for purchasing and installing these systems.

- **Providers** - Since providers are a major group of users of applications like EMR it is important to ensure that provider buy-in is obtained at an early stage in the project. Understanding provider requirements and ensuring that a system is optimized to accommodate the workflow of busy providers are important aspects of promoting use and adoption. In addition, the potential benefits to providers of using applications like EMRs should be made clear at the beginning of a project.

- **Provider champion** -- The clinical nature of the EMR requires clinical oversight, direction, and backing, just as the practice management requires administrative project heads, and both require IT managers. Without the full backing of the provider champion, it is very difficult to have a truly successful EMR implementation.

- **Nursing staff** - In addition to providers, nursing staff are often heavy users of clinical applications. The potential benefits including time savings, quick access to information, and comprehensive medical record keeping are all strong reasons to promote use of the application. Like providers, the nursing staff **needs to be** engaged very early in the planning phase of the project. Especially important is working with nursing staff on potential workflow and process changes that will occur with a new
system implementation. Additionally, a key benefit of the EMR, as stated above, is that it elicits more efficient use of RN, LPN and MA time, as opposed to inefficient usage of provider time.

- **Clinic managers** - Clinical managers play a key role in overseeing day-to-day clinical operations, workflow, and quality improvement initiatives. As part of system planning and implementation, involving clinical managers in requirements assessment and workflow is critical.

- **Billing and administrative staff** - Engage with billing and administrative staff early when implementing a practice management system (PMS) system. Users should be involved in requirements-gathering and vendor selection to ensure that the selected system meets the needs of the user community.

- **Medical records staff** - Medical records staff are significantly impacted by the implementation of EMR and new PMS systems. Most medical records staff positions migrate into a digital format. Staff that are willing to evolve are retrained and can move into an HIT related field.

- **Board of Directors** – Complete support from your Board of Directors is crucial to the successful implementation of EMR in your center.

a. **Reaching Consensus with the Board of Directors**

- Point out that this project has been in your strategic plan and your long-term budgeting process.

- Explain the reasons you are recommending the move. Utilize the goals and objectives from the Steering Committee if applicable.

- Show the budget with absolute transparency. Identify hard costs (hardware, software, infrastructure needs, etc.) and soft costs (i.e. loss of productivity during implementation). There should be clear and open discussion regarding the short-term impact on provider productivity.

- Demonstrate the research that shows the returns over time: sometimes in finances and more often in patient outcomes, clinic efficiency, and patient satisfaction.

- The Board should set the expectation that all providers will be required to enter the digital health care environment as their center transitions to using an EMR.

- Ensure that you have the Board’s full and unquestioning support, including potential cost overruns, and including times when staff, patient, and even some mid-level management may be questioning the strategy.
ACTION STEP (All Centers): Have thorough discussions with your Board of Directors, with absolute transparency, and ensure that you have their support in moving forward with the implementation.

b. Maintaining Active Open Lines of Communication with All Levels of Staff
   - Staff is often wary of EMR implementation fearing job security as a primary concern. By engaging staff early, these user concerns can be addressed.
   - In addition, staff can be appropriately prepared for the new work processes and how their skills can be leveraged once the new system is in place. EMR implementation has not typically caused a reduction in staff numbers in health care centers.
   - Prior to any HIT implementation it is critical to connect with everyone whose work will be affected by the new technology. Ideally, each key constituency such as physicians, nurses, medical assistants, client administrative staff and others who will eventually need to interact with the system should be involved in identifying requirements and designing the system. This approach is likely to optimize the system usefulness and adoption. It is important that individuals understand, up front, how the system may affect their work as well as the benefits of moving to a new clinical system. The resources below highlight some tips for engaging the range of stakeholders at early phases of a HIT implementation.

http://www.norc.org/6275/Module6/Importance%20of%20Building%20Key%20Relationships.pdf

http://www.norc.org/6275/Module6/Patient%20Information%20-%20What%20are%20EMRs.pdf


ACTION STEP (Each Center): Ensure that all staff members at all levels have been involved in discussion regarding EMR implementation. Ensure that all disciplines and levels are represented either in the Network Steering Committee, or your Center Implementation Team.
10. IDENTIFYING AND UTILIZING OPPORTUNITIES FOR COLLABORATION

A core feature of HRSA's strategy to encourage EMR adoption among health centers and other safety net providers is collaboration. Several health center networks have successfully begun planning and implementation efforts around HIT and have demonstrated a "proof in concept" that collaboration in implementing HIT can result in economies of scale. This is particularly true with respect to finding executive leadership to manage and direct HIT implementations.

IA/NEPCA and INConcertCare offer an ideal Network with which member centers already have gained familiarity and confidence. There is ample additional information on the benefits of Network level implementation, which can be accessed by utilizing the resources in the reference list at this end of this manual.

Engaging with key stakeholders in the community is also important when adopting an EMR system. A significant factor in the process is becoming familiar with other HIT initiatives within the safety net and the larger community health system. This often results in ongoing discussions with local providers and other CHCs. This can help with some applications including electronic prescriptions when the pharmacy has a sophisticated IT system, or the local hospital to share labs and diagnostics.
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SECTION II: 
PRE-IMPLEMENTATION PLANNING

After the decision to implement has been made, an organization needs to go through a number of steps to select the system that best meets their requirements and assess if there are any changes that will be needed in the current infrastructure to support the new system. There are numerous vendors selling systems to the health care market and there are numerous contractual and procurement considerations. In addition, organizations need to establish maintenance plans to ensure that their system does not become obsolete. The resources in this module provide guidance on how to plan for technology implementation.

A. PROJECT CHARTERING (Network HIT Steering Committee) – If the Network HIT Implementation Steering Committee has not already done so this is the time to discuss and draw up a Project Charter for the implementation process. Using the previously agreed upon timeline, goals, and objectives, the Steering Committee can go through a process that forces the members to define the specific direction and purpose of the Committee and of the project. In its entirety, the Project Charter ushers the committee through the span of the entire project, including organizational goals and objectives, the ever-evolving timeline and work plan, clarification of roles and responsibilities, the high-level communications plan, and the risk assessment and mitigation plan (discussed later in this manual). This forces the Network HIT Implementation Steering Committee to openly discuss and consider the salient features of the pre-implementation phases of this project.

Key Point: The Steering Committee will draw up a formal Project Charter, identifying and defining their mission, acknowledging the work and commitment it will take to succeed, and referencing other critical factors to be addressed along the way.

B. STAFF ASSESSMENT AND TRAINING

1. Staff members vary considerably in their computer skills and comfort level with basic applications. They are often intimidated by the mention of an “EMR.” A sizable percentage of staff may have little to no computer experience at all.
2. All staff members and providers should be given a simple assessment of computer literacy and typing proficiency (see Appendix II.2 at the end of this section). After this assessment, it will likely be determined that a basic computer literacy and typing course will be required for all staff in advance of the first steps of EMR implementation.

3. Certain providers may never have used email or the Internet as they may have spent years to decades with paper charts and less than efficient work processes that were never questioned. Thus, some health centers may develop different training plans for different user groups (e.g. providers, nurses, allied health staff, administrators, and office personnel). Based on other health centers reports, the average training time required is 15-20 hours but some will need more and some will require less training.

**Key Point:** All staff will be given assessments to determine general computer competencies. Based on the results of these assessments, training will be provided to ensure that all employees have the basic computer skills required to work with a PMS and EMR.

### C. ALL CENTERS PARTICIPATE IN INITIAL PLANNING AND STRUCTURE

This section focuses on preliminary steps that ALL of the centers will undertake together to prepare for implementation of the new information system. As you will see, the process is not simple or brief. However, it is essential that all centers plan together and voice their perspectives as important decisions are made. The decisions made at the beginning must basically hold true for all centers throughout the staged implementation process.

1. **BEGINNING THE TRANSITION**

   It cannot be stressed enough that regardless of where a center is in the line-up for the planned implementation it is essential that the center’s project leaders are involved with the planning and decision-making process from the beginning. These centers have an advantage of having input, as do all centers, but also learning from other centers’ bumps and bruises. The centers implementing later will be complying with all standardization decisions made by the Network.

2. **CENTER LEVEL PROJECT LEAD**

   If you have not already done so, identify the HIT Project Implementation Lead at your center. This role will likely be designated by the Executive Director and may in fact be the Executive Director. In other cases, it could be the Physician Champion or the head of operations. In any case, the Lead must be proactive, enthusiastic, and exceptional at organization and communication.
3. CENTER IMPLEMENTATION TEAM
   NOW is the time to pull together the first meeting of your center’s HIT Implementation
   Team. Suggested members include:
   ● Provider Champion
   ● Clinical Support
   ● Nursing, CMA, and/or Lab Staff
   ● Operations/Administration
   ● Billing/Coding

   KEY POINT: Each center must have a Center Implementation Team to lead the center
   through the implementation process. They must meet regularly, every one to two weeks. The
   following section is dedicated to the Center Implementation Teams, although all staff is
   encouraged to read it so that they can be of optimal assistance to the Center Implementation
   Teams when input is needed.

D. THE PURPOSE OF THE CENTER IMPLEMENTATION TEAMS -- is leading the center
   through the implementation process. The Center Implementation Team is the center’s
   interface with the Network Steering Committee. They are positive, proactive, skilled,
   innovative, and great communicators. Their mission is to optimize the potential of the HIT,
   by changing the work flow processes and physical layout to be as efficient and streamlined
   as is the HIT itself.

1. WHEN EVERYTHING CHANGES
   Now it is time to think about all of the tasks that center staff performs related to patient
   care, practice management, and reporting. Consider the percentage of those tasks,
   especially for front line staff, that involve the patient chart. Each one of those tasks, or
   processes, will change with the implementation of PMS and EMR.

   At the network level, the HIT Steering Committee, along with internal specialists in
   focused sub-committees, will be researching best practices so that the EMR can be
   constructed with templates that correspond with those best practices, which will lead to
   optimal patient outcomes. Your center’s team will analyze how these templates work in
   your center and can make additions or revisions for negotiable, non-standardized items
   as required.
2. **Change Brings Opportunity**

There is a wise old phrase that says something like, “Every change is an opportunity for improvement.” This is one of the largest changes a health center (or network) may ever take on – so what an opportunity for process improvement! This is a time to optimize the functions of the PMS and EMR, to centralize functional activities as much as possible, and make your life and work significantly more efficient and foot-friendly. So, the first step is to just start talking. Your first responsibilities will be to:

**a.** Create a planned meeting schedule and stick to it. Your other traditional work responsibilities should be assigned to other staff during the meeting to ensure your full attention during your center’s HIT Implementation Team meetings. You should also be given scheduled administrative time for “homework” instructions. The Executive Director and your immediate supervisor should all agree that this is of utmost importance.

**b.** Per instructions you will receive before the project begins, you will be assisting with distributing an assessment tool, to evaluate the level of comfort people have with various computer skills.

**c.** **Plan the Kick-Off!!** Now that the key players are identified, plan a semi-formal event to present this project to the rest of the staff and to the Board. You might even want to let your patients in on some of the action! (Caution: Your Kick-Off Date is contingent on your center’s order in the Network level work plan and time line. But when it is your turn, you will definitely want to “Kick It OFF.”)
3. The following SAMPLE IMPLEMENTATION TIMELINE represents a conservative guideline for a relatively small center.

A. Six months before “go live”

- The Steering Committee, with input from other Network committees and center staff, develops standards and guidelines for the scanning and input of documentation and medical records in established patient charts.

B. Three to four months before "go live"

- Install hardware in the rooms or purchase wireless equipment including tablets and/or laptops.
- Upgrade any existing equipment you plan to retain to meet the EMR vendor specifications.
- Ensure the functionality of your Network and hardware and that everything can communicate with each other.
- Install and verify your scanning and faxing capability.
- Ensure that e-prescribing and messaging are functioning effectively.
- Accomplish any basic computer teaching that is necessary and get feedback from all of your staff members.
- Ensure your team is working well together.

C. Two to three months before "go live"

- Establish your protocols for scanning incoming information and faxing outgoing information.
- Continue to build general computer skills and continue to receive staff feedback.
- Install and test any ancillary programs which might either be required or be very helpful which includes speech-recognition programs, accessory faxing, and scanning programs, etc.
- Begin to use the EMR for scheduling purposes.
- In an ideal world this would be the time that your electronic medical record software would be installed. This would allow the providers and office staff time to fully check out the system and make sure everything works. Sometimes this is not done because the teaching and installation is done at the same time by the vendor, very close to the go live day. Whatever the exact time between software installation and starting to see patients using the record a few things should be checked out:
  - Ensure that the software and hardware function as expected. Make sure that
screen transitions are quick and that there is no lag in how the system is performing.

- Test the interoffice messaging system and make sure you can fax prescriptions.
- Test printers.
- Scan some material into the record to test this functionality.

- Run through some mock patients in order to get a feel for how the system is working and for patient flow through your office.

D. One to two months before "go live"

- Established patient historical medical records and documentation are loaded into the EMR.
- All new patients are loaded into the EMR (along with traditional paper documentation).
- All patient visits are conducted through the entire EMR process.

**Key Point:** Each Center’s Implementation Team will design their own center’s work plan and time line in conjunction with the Network HIT Implementation Steering Committee.
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E. VENDOR SELECTION

The vendor evaluation and software demonstration processes have been organized and overseen at the network level, ensuring that center staff members have had the opportunity to evaluate and score the final vendors. Contract negotiations are also being done at the Network level so that the benefits of multiple centers and a larger system can positively impact the financial cost.

1. CONSIDERATIONS

There are numerous ways in which vendor assessment can be approached. As an initial step, an organization should get familiar with the different vendors for a particular solution. This can often be quite a daunting task considering that there are more than 200 vendors of EMR solutions today. First steps may include attending a conference or purchasing a report through an Internet site. Since there are numerous vendors in the marketplace today, by doing some background research an organization can develop a more refined list of potential vendors.

Ideally, vendors will come to your center and do a live demonstration, projecting their computer screen onto a large screen so viewers can watch the vendor navigate the system and demonstrate its strong points. It is important for the center leadership and staff to have a list of priority features and functions, as the vendor is likely to show his/her software’s strong suits, and avoid the topic of shortfalls completely.

Vendors may be compared most objectively if the staff leadership has created a weighted list of priorities, weighted by importance to staff. As viewers follow the demonstration, and request certain desired functions to be demonstrated, they can rate the software on each desired feature. After the demonstration, a simple calculation of total points on a feature times its weighted value will give you comparisons on individual features, as well as a total point value of all desired features combined on a weighted basis (See Appendix II.1).

It is also possible for a demonstration to be done via a shared website demonstration, but this method lacks the viewer’s ability to see the actual keyboard and mouse process. Viewers are also less likely to ask questions during a web-based demonstration.

2. CONTRACT NEGOTIATION

The next step is generally to write a Request for Proposal (RFP). The RFP details the technical features you are intending to purchase; this allows vendors to respond directly to your needs. This also creates a structured, standardized document that enables comparison of each vendor’s features along with associated cost.
When the vendor is selected, issues that should be explicitly addressed within the contract should include the following:

a. Vendor support: is it available 24/7?

b. Does the vendor commit to time limits to respond to service requests?

c. Are software upgrades included in costs, or would they have to be purchased additionally?

d. What is the charge for technical support, above and beyond the software cost?

e. What is the degree and method that the vendor will commit to staff training? Will they be physically present in early implementation?

f. How long is support provided after implementation is complete? How does the vendor define that the implementation is complete?

**Key Point:** The Network, along with the Network HIT Implementation Steering Committee, will utilize a weighted list of Network requirements and preferred features that will be essential in vendor selection and contract negotiations.
F. CERTIFIED EMRS

The Certification Commission for Health Information Technology (CCHIT) has developed criteria for EMR systems that allow them to be certified. A CHC should only use a vendor that sells certified EMR software. Another term that is heard in this context is “ARRA.” ARRA stands for the American Recovery and Reinvestment Act. This Act has identified the criteria in great detail, in a somewhat understandable fashion, for a “Qualified Electronic Medical Record”, as follows:

‘Qualified electronic health record’ means an electronic record of health-related information on an individual that -- (A) includes patient demographic and clinical health information, such as medical history and problem lists; and (B) has the capacity— (1) to provide clinical decision support; (2) to support physician order entry; (3) to capture and query information relevant to health care quality; and (4) to exchange electronic health information with, and integrate such information from other sources. To read the details associated with each of these criteria, please refer to the following web site:


G. HIT STANDARDS AND STANDARDS DEVELOPMENT ORGANIZATIONS

One of the major issues in HIT today is the lack of interoperability between disparate systems. This lack of integration and communication has frequently resulted in “silod” information stores and duplicate data entry which is both time consuming and introduces the potential for errors. The use of standards for the transmission and the representation of health care information lead to an ability for information to be moved between different systems. In this module we provide an overview of HIT standards and Standards Development Organizations (SDOs).

1. THE CORE OF THE HL7 STANDARD is the Reference Information Model (RIM), a large pictorial representation of the clinical data (domains) that identifies the lifecycle of events that a message or groups of related messages will carry. It is a shared model between all the domains and as such is the model from which all domains create their messages.

The HL7 v3 standard also specifies the Clinical Document Architecture (CDA), an XML-based mark-up schema for specifying the encoding, content, and structure of clinical data documents for exchange among data provider and data consumer applications. The Continuity of Care Document (CCD) is an example of a document type that conforms to the HL7 CDA specification.
2. **DIGITAL IMAGING AND COMMUNICATIONS IN MEDICINE (DICOM)** is a clinical messaging syntax used to exchange medical images between medical equipment and information systems. The DICOM standard was created by the National Electrical Manufacturers Association (NEMA) to aid in the distribution, storage, and viewing of medical images, such as computed tomography and magnetic resonance imaging scans and ultrasound. DICOM enables the integration of scanners, servers, workstations, printers, and network hardware from multiple manufacturers into a picture archiving and communication system (PACS).

A practical example is the transmission of x-ray images to an electronic medical record. The ability of the sender and the receiver to mutually use the DICOM standard allows this transmission to succeed.

The different devices come with DICOM statements that clearly identify the DICOM classes they support. DICOM models the image acquisition process and information objects related to imaging, and it specifies how the image data, the metadata, and related objects are represented in a binary format.

DICOM has been the global standard for medical image information since the 1980s. It is pervasive throughout the medical imaging community and nearly every medical imaging device supports some aspect of the standard. DICOM has been widely adopted by hospitals and is making inroads in smaller applications like dentist and doctor offices.

DICOM is an independent, international standards development organization administered by NEMA's Medical Imaging and Technology Alliance. More information on DICOM can be found on the [NEMA Web site](http://www.nema.org).

3. **THE NATIONAL COUNCIL FOR PRESCRIPTION DRUG PROGRAMS (NCPDP)**, an American National Standards Institute (ANSI) accredited Standards Developing Organization (SDO), is responsible for the continued development and maintenance of the NCPDP standards for pharmacy services messaging. The NCPDP standards include several syntaxes used in the exchange of pharmacy information, such as:

   a. **Telecommunications Standard** - used for eligibility communications between retail pharmacy dispensers and payers/pharmacy benefit management companies (PBMs).
   
   b. **SCRIPT Standard** - used to transmit electronic prescriptions from a physician or prescriber to the pharmacy; specific messages include New, Change, Renewal, Cancellation, and Fill Status.
   
   c. **SC X12N-2701/271 Eligibility and Benefit Standard** - used for eligibility and benefits communications between dentists, professionals, institutions, and health plans.
   
   d. **NCPDP Formulary and Benefit Standard** - provides patient benefits information to
physicians at the point of care. NCPDP also maintains and updates the Provider Identification Number (Provider ID) database, the source of identifiers that accurately identifies pharmacies in electronic transactions.
### INConcertCare and IA/NEPCA
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SECTION III: WORK FLOW ANALYSIS & PROCESS IMPROVEMENT
KEY POINT SUMMARY

1. Each center’s HIT Implementation Team will meet and discuss each of the discussion questions listed in “Working to Centralize Common Functions,” in preparation for their work flow analysis. Centralization will be a prime consideration, so that different tasks with a common function will have consistency.

2. Each task on the center’s implementation tool “Task List for Work flow Analysis,” will be analyzed through work process analysis, asking the following basic questions:
Communication? Supervision? Review! Double Check!

3. Each task on the list will go through work process analysis, to achieve optimal efficiency and benefit from the HIT implementation. While many IT processes will be standardized at the Network level, each center will:
   - Map out every work process currently utilized at the center (pre-EMR)
   - Assess each process with a fresh eye and open mind
   - Utilize perspectives from all involved disciplines
   - DISCARD ASSUMPTIONS that are limiting in any way
   - INVENT or ENGINEER new processes that are lean, clean, and efficient

4. Each of these new or revised policies and procedures must be detailed in writing and formalized in the Policy Manual.

5. Centers will follow the guidelines provided by the INCC Network HIT Steering Committee regarding data entry and scanning of historical data. The Committee will set the standard for required data fields; providers may have more data than that in the EMR, but not less.
WARNING!! THIS IS THE HARD PART
(BUT ALSO THE MOST IMPORTANT!!)

SECTION III:
WORK FLOW ANALYSIS & PROCESS IMPROVEMENT

A. OVERVIEW -- As detailed in the following section of this manual, the next step for each center to take (or a small mountain to climb) is to start a very thorough (and time-consuming) clinical work flow analysis. Developing a comprehensive understanding of how the organization currently does work and anticipates doing so in the future is a key step in outlining the requirements of the HIT system. Work flow models are useful in providing visual representations of clinical care processes. Health care processes are unique in that they tend to be complex with numerous handoffs, are often time-sensitive, and span many departments.

By developing work flow models of existing processes an organization can start evaluating which processes are inefficient or redundant and which processes can be optimized. Work flow modeling and analysis is important prior to system implementation as it offers the organization the opportunity to optimize how work is done and ensures that broken processes are not replicated once the new system is installed.

1. MAPPING OUT CURRENT PROCESSES -- For most people, this process grows best when plenty of time is given before and during the work flow analysis process for thinking and visualizing. Think about patient flow and all of the steps you take and words you write in the course of your usual day or week. Give some thought to what has worked well and what may have been a problem: processes at work that are slow, frustrating, redundant, and maybe forgotten at times.

   a. The first critical step in this process is mapping out and documenting the current work flow. An organization needs to understand the work flow in its current state in order to make informed decisions about a future state.
b. This is a TEAM process. Each Center Implementation Team will be directing the big picture but every staff person should be involved in the process.

c. You, meaning the Center Implementation Team, along with the staff that performs the work every day, will be mapping out the steps of each and every work process for clarity – to the degree that it is helpful to you. If not mapped out, they will be spelled out in detail in procedure form (which is especially productive when you will ultimately need it in procedure form, also).

- Some processes are related closely enough that mapping out one or two will give you an easy guide on how a whole series of tasks may flow. New written procedures, competencies, processes, and policies (when applicable) will be drafted and implemented after trial runs with the EMR to document and standardize the processes. Some tasks will have written competencies that staff will have to demonstrate before performing independently. This, too, is very time consuming and tedious work – yet absolutely essential.

- This manual provides you with a basic list of “functions” to consider, which are, later in the process, broken down into tasks. Generally, no matter how thorough the project teams are, there will be continued processes and tasks to be sorted out long after an EMR has “gone live.”

d. Once the list is mostly compiled, you will use it as the basis for this critically important work flow analysis. This manual will provide guidance on process mapping and work flow analysis. You will map out, or opt to make detailed lists, of how each current process works. This is the basis for the initial analysis. How effective has our process been in the past? What has worked well about it? What has caused problems?

e. Then, we will all be working together to analyze the bigger question: How will this process need to change with an EMR when we no longer have a paper chart? Knowing what we learned from our previous practice, NOW what is the best way to complete this process? Again, this is a group effort to gain a span of perspectives.

f. One basic rule to follow is this: forget the old rules. Open your mind to allow full creativity and range of options.

g. Also, BEWARE of assumptions of any kind. Do not: guess how other people do their jobs; assume you know where problems/bottlenecks occur; pretend to know
why things are done a certain way; assume that everyone does it a certain way; or believe that any type of change is out of the question. This is the time to open up our minds and see new ways of doing things.

2. **Network HIT Steering Committee Provides Standards of Practice – with Input From All Centers**

   a. With support and assistance from the Network Steering Committee, centers will standardize processes and documentation templates for the EMR that are demonstrated and proven best practices. If national best practices are unclear, our centers will determine best practices on which to standardize whenever possible. ALL centers -- the specialists in each area – are encouraged to speak out about what works for them and what does not.

   b. Keep in mind, this work flow analysis and planning stage is the longest, most tedious part of the whole EMR implementation process. It is also the most crucial element that determines how smooth, or how frustrating, this whole process is for your entire work team and for your patients. It is a key factor in how effective your HIT system is and how much you and your center may gain from it.

3. **Diligence: Key to Success --** As we said at the beginning of this guidebook, it is proven that a lack of work flow planning is what causes many EMR implementations to literally fail. As important as the software system we choose may be, the work flow planning and change implementation is what makes our whole process succeed or fail. Optimizing the potential of the PMS and EMR is done with practical knowledge, common sense, and some creativity.

4. **Centralizing Functions --** The goal is to centralize as many processes as possible. We will start out working on a list of functional topics that should be discussed with a focus on centralizing the processes around each item. Starting on the following page are some common workplace functions and basic steps that will need to be analyzed, discussed, and ultimately centralized. The Center Implementation Team will meet regularly (that is one of the first decisions you will make). Take one to three of the functions in the following worksheet (or others that you think of) as your agenda items for each meeting, and start brainstorming.
INCC HIT IMPLEMENTATION TOOL:
WORKING TO CENTRALIZE COMMON FUNCTIONS

1. Centralizing common functions
   ● Determine a central location for ALL incoming documents.
   ● Determine a central location for all prescription requests.
   ● Determine a central location for all lab & test results.
   ● Determine a central location for all scanning.

2. Saying farewell to the paper chart
   ● Determine under what circumstances the paper chart still should be pulled.
   ● How many times may a chart be pulled?
   ● What happens after each chart pull?
   ● What happens to the chart, and in the EMR, after the “Final” chart pull?

3. Talk about messaging
   ● Who will translate phone calls into messages?
   ● How will providers be alerted regarding emergencies or urgent situations?
   ● Will phones be answered or routed to voicemail?
   ● Who will take ‘patient problem’ calls?
   ● Which messages need to be saved to chart and which should not?
   ● No show policy – call, letter, note to chart?

4. Talk about e-prescribing
   ● Who will enter phone refill requests?
   ● Who will manage pharmacy listings?
   ● Where will the dedicated paper tray be for required scripts on special “security” paper?
   ● Review your previous policies (written and unwritten) on prescriptions and refills:
     ▪ Who will have permission to “okay” and submit refill requests?
     ▪ What prescription requests must have a provider’s intervention?
     ▪ Do we want to have “standing orders” or protocols for nurses to handle some prescription and refill requests?
     ▪ Who and how will patients be told to call the pharmacy for refill requests?
   ● Discuss referral physician list
   ● Who will be responsible for on-going scanning at each site?
   ● When does a document require review?
What information will be pre-loaded?
How will information be tagged to be scanned?
How many times can a chart be reviewed for scanning, and by whom?
What markings will the chart receive during each step?
How will staff know a patient is totally electronic (chart retired)?
Are variations allowed? What is the process for determination?
  ▪ Who is responsible for folder names for scanned documents?
  ▪ Who determines what goes in each folder?
  ▪ Who is responsible for processing scanned documents?
  ▪ What is the protocol for determining what incoming documents have to be reviewed by the provider?

5. **Discuss lab & procedure ordering and informing of results**
   - Review your current procedures (written and unwritten) for lab result notification and follow-up.
   - Who will track and follow up on overdue lab orders?
   - Who will track and follow up on overdue lab results?
   - Who will inform patients of normal results?
   - Who will inform patients of abnormal results? How many attempts are required, how should they be made, and by when?
   - Who will enter in lab values in the EMR if received on paper?
   - What lab forms will need to still exist? How will they be completed?

6. **Talk about patient visit flow and charting**
   - Who has sign-off privileges?
     ▪ MDs, NPs, PAs
     ▪ LCSWs
     ▪ CDEs
     ▪ Case Managers

7. **Review the flow for different types of patient visits**
   - Who is responsible for what parts of the interview and assessment?
   - How will the provider inform support staff of post-exam orders?
   - Who reviews patient education materials with the patient and documents it was provided?

10. **Discuss patient forms, letters, and educational literature**
    - What will be individualized in the EMR, printed, available on the web site, etc.?
Key Point: Each Center’s Implementation Team will meet and discuss each of the “discussion questions” listed in preparation for their work flow analysis. Centralization will be a prime consideration so that different tasks with a common function will have consistency.

B. PROCESS IMPROVEMENT

There are many ways to organize the processes and tasks that make up a patient visit. One way is by “function,” as in the steps discussed above. Each function is the hub, or center, of a group of tasks. Now we need to get down to the detailed analysis of each task:

1. WHAT individual tasks are involved in the function?
2. WHAT are the individual steps in each task?
3. WHO has been doing each step (if applicable)?
4. WHO do we want to do that step now, with the EMR?
5. WHERE will they do it?
6. WHO needs notification or communication of this?
7. WHO will follow up (if applicable)?

C. PATIENT VISIT FLOW ANALYSIS

1. This section will address formal work flow analysis, or process analysis. This is where we get down to the detail level. However, being organized and patient with this stage is what is going to help your first weeks with EMR run as smoothly as possible.
   • Be prepared: this is very time-consuming, takes much thought, and requires many different perspectives at the table.
   • It is done by a multi-level and multi-disciplinary team and everyone must know that his or her voice will be heard.
   • “Ground Rules” when the group comes together can ensure that everyone feels safe speaking her or his perspective and that all ideas will be considered.
2. With each of these tasks, we are asking you to breakdown the process, step-by-step. Write out, or map out, who is doing what, where, in what order, when, and how.

3. The step-by-step mapping allows you to truly ANALYZE the process. Look at the actions, the movements, and the pieces of the puzzle. Make the paper trail as close to reality as possible. Once you have recognized every step in the process, step back and take a long look. Envision the process and where the principles of logic do and/or do not lie in the process. Look at the overall process for gaps, for duplication, and listen for history of problems or omissions.

4. Once everyone understands the task and what it entails it is time to BRAINSTORM! The BIGGEST change that we have to envision is that we are taking away the paper chart through utilization of the EMR. Without following the chart around, without physically writing in a document that moves around with the patient, what can you do to make this process more efficient? How can you get the job done well with each step documented and communicated to everyone that needs to know?

5. When you have some good thoughts, write down each step of your potential EMR processes. Map it out, or list the steps. Physically walk through the steps. Try ideas out to see what really happens. Bounce your ideas around to others who have done the process or are affected by the process.

6. Whether you are using flow charts or process maps, closely analyze the steps on paper. Look for holes in efficiency and for duplicative actions. If it seems to work well on a flow chart, take the next step. Write a procedure: just put down step-by-step how you want this task to be performed. You may have to tweak it again and again, but you now have a good first draft for your procedure manual.

7. YOU HAVE MAPPED A PROCESS (although you may not be mapping it for the last time)!!! For now, just celebrate progress and move on to the next one!
D. INConcertCare Process List for Process Mapping & Revisions for PMS & EMR

1. Following is a list of health center tasks that would likely be involved in an average patient visit. The tasks are in approximate order of how they would take place in a patient visit. In the process of transitioning to an EMR and new PMS, the changes in these tasks, or processes, are often as confusing and overwhelming to staff as is the actual usage of the PMS and/or EMR.

2. To ease this transition as much as possible, we are encouraging you to go through each and every interaction you have with a patient, and consider how that task will be affected by:
   - The absence of a chart and
   - The addition of the electronic medical record.

3. There are many approaches that may be taken to work flow analysis; but the crux of it is that you be mentally and logistically prepared for the complete changes your clinic flow will undergo when the EMR enters the picture. Please take this list and customize it for your center. We will be talking in a later phase about how you can approach your re-design of all these processes.

4. We are including, right after this task section, a worksheet or template which you can use to develop each of these tasks. If that works for you, use it. Otherwise, design one that makes sense to your team!! (And yes, we do mean that each and every one of these tasks needs to be re-thought with an efficient process revision for the EMR.)

5. Eventually, you will have all of this in the form of an exceptionally detailed policy and procedure manual!
INCC HIT IMPLEMENTATION TOOL:
TASK LIST FOR WORK FLOW ANALYSIS

For each individual task, ask the following:
COMMUNICATION? SUPERVISION? REVIEW! DOUBLE CHECK!

➢ Front Desk
  ● Scheduling new patient
  ● Scheduling established patient
  ● Pulling charts for established patients, and reviewing for type of scheduled appointment
    ▪ Preparing paperwork that will be needed and ensuring that supplies are readily available
  ● Preparing charts for new patients (if included in center policy. Utilize minimal materials in case of “no show.”)
  ● Changing an appointment (remembering to cancel the “old” one)
  ● Appointment reminder calls
  ● Missed appointment calls
  ● Checking in the patient
  ● Giving and documenting appropriate patient materials
  ● Checking/changing demographics
  ● Calculating financial status
  ● Calculating charges and actual amount due
  ● “Putting chart up” – OR letting the CMA/LPN/RN know that the patient is ready
  ● Requesting records from another facility
  ● Applying for free medications (e.g. Merck for Gardasil)

➢ In the “Back”
  ● Taking vitals / weight / BMI
  ● Review of past and current meds
  ● Providing patient with a current medication list
  ● Changes in personal or family medical history
  ● Documenting that you checked for allergies
  ● Documenting the history of present illness
    ▪ What are the significant questions to ask and document related to this?
Who determines these questions? Who asks these questions?
- Do we need records from other providers during this visit if possible?
- Consider any other data that can be gathered by clinical support staff so that the provider can focus solely on the diagnosis and plan of care.

**HCP (Health Care Provider)**
- Asking additional questions and documenting additional info
- ROS (Review of Systems) and physical exam if indicated
- Determining and documenting discussion with patient and determined individualized plan of care
  - Ordering lab work
  - Other in-clinic tests
  - Other outpatient testing
  - Referrals
  - Entering or ordering / scheduling the ordered tests / meds
  - Instructions on when to Return to Clinic (RTC)
- How is this conveyed to support staff? Or how is it conveyed if the HCP does it her/himself?
- When lab work or tests are completed in-house where is that documented?
- When lab work or tests are sent out for completion where is that documented?
- How does it get onto appropriate logs?
- How and when does patient expect to get results?
- Prescriptions?
- Samples?
- In-house pharmacy?
- E-prescribe?
- Documentation of lot number and expiration dates: Where is it documented? Who checks, how frequently, documents where?
- Education and consents documented accurately?

**After the Provider Leaves the Exam Room**
- How does nurse/CMA know what (s)he did and what (s)he wants done?
- Where does (s)he work with the patient to follow through with any on-site orders?
- Who notifies the patient of the result?
- How can we be sure (s)he enters the test and the result immediately? And ensure it is on the charge slip?
- If it is not a test that gets immediate results (e.g. you are sending to the lab), where do you document that in the EMR? Where do you log it in the office? Who checks the logs to see
if results are not returned in a timely manner?

➢ Check-Out
  ● How and where does the patient check-out?
  ● Does anyone review the fee ticket for accuracy? Have the codes already been entered by the provider, or is it done at check-out?
  ● What is said to the patient about payment and billing?
  ● Has the patient received the required (and best practice) take-away documents such as:
    ▪ Medication Reconciliation List
    ▪ Visit Summary
    ▪ Care Plan
    ▪ Procedure / Home Care Instructions
    ▪ What else can you think of?
  ● How do you end the visit without a chart? How do you ensure that everything is done?

➢ After the Visit
  ● How is tracking of off-site test results and referrals being done?
  ● What are the guidelines of notifying of normal results?
  ● What are the time lines and guidelines of notifying of abnormal results?
  ● Where is this documented?
  ● Where is the plan of care documented?
  ● Is a tickler file set up to track the next follow-up visit?
  ● Is there a chart (or EMR documentation) review? How often?
  ● Who checks the coding for accuracy?

➢ Follow Up on Lab Tests and Diagnostics
  ● Who, if anyone, assists the provider with this?
  ● Who keeps the “tickler” system, or some means, to be sure that abnormal results are followed up in a timely manner?
  ● Who will write the generic letters for the different lab/Pap results? And add new ones as needed?
  ● Who needs to approve these?
  ● What needs to be in hard-copy, printed form?
- **Miscellaneous**
  - Request for records?
  - Release of records?
  - Flags / Alerts?
  - Occurrence Reports?
  - Inventory
    - Supplies
    - Meds
    - Vaccines for Children / Adults
    - Checking Refrigerator Temp Logs
    - Electronic Signatures / Signature logs for charts

- **Phone Messages**
  - What gets documented and what does not?  (There must be a written policy for this)
  - Who transfers calls to written messages?
  - What messages go to providers?
    - What messages go to nurses?
    - CMAs?
    - Medical records personnel?
    - Billing?
    - Manager?
  - What is the procedure for emergency calls?
  - Standing orders for nurses?
  - No show policy (call, letters, note to chart)?
  - Reminder calls for appointments?
  - Prepare charts evening before?

- **E-Rx**
  - What is the process for entering refill requests?
  - Which can nurse or CMA refill; how is provider notified?
  - Which prescriptions must be approved by a provider?  (There must be a written policy for this.)
  - Who manages pharmacy listings (fax, phone numbers)?
  - Who educates patients to call pharmacy for refills?
  - Where is the paper tray for printed scripts?
Faxes
- Keeping up referring providers’ fax numbers
- Monitoring incoming faxes
- Monitoring failed outgoing faxes -- This can be a critical issue!
- Educating referring providers about faxing data to new number

What do we need to look at for different types of appointments? What types of appointments would need to be treated differently?
- Special Programs
  - Behavioral Health
  - Oral Health
  - Vaccines for Children
  - Prenatal / OB-Gyn
  - Urgent Care
  - Family Planning
  - Pediatrics/Well Baby/Child Visits
  - Contagious illnesses
  - Tobacco Cessation
  - Chronic Disease
    - Cardiovascular
    - Diabetes
    - Asthma
    - Depression
- Others as required
E. **PROCESS MAPPING “101”**

1. Process mapping (also known as flow charting, or many other names) is very subjective. In other words, it covers a wide range of specificity: it can be very high level (general, without great detail) or at a nitty-gritty, nearly microscopic detail level. The process list above, broken down into tasks, was a form of process mapping, completed in list form rather than with the flow chart (boxes connected with lines and arrows).

   a. The process list above, by its major categories, takes one through the flow of a very typical, generic patient visit. Toward the end, it does get a little more complicated, for example, with break-outs of normal or abnormal labs. If your group can visualize tasks more effectively through flow charts, it can be done very easily by hand: by using “Magic Markers” and large pads of paper or a dry-wipe board. Even a pencil and paper can work.

   b. A novice can do a simple flow chart on a computer quite easily so try it with the general patient visit flow in the above list. Here is a “high level flow chart” (nothing fancy needed) of a simple patient visit: Front Desk → to the Back → Health Care Provider (Actual Visit or Exam) → After the Health Care Provider Leaves the Room → Check-Out → After the Visit → Follow-Up → (etc., etc.)

   c. Now, start drilling down. Under “Front Desk,” the first task is “Scheduling a New Patient.” Let us say we have no practice management system yet at our clinic. Look at how we are scheduling a patient right now. For those who do not think spatially, just use a simple list. We will be sure and answer the questions that we are addressing on every work process analysis.

   - The phone rings
   - The person designated to answer the phone answers it. She sits at the reception desk, and doubles as check-in / check-out person.
   - The caller states she wants to schedule an appointment.
   - The staff person asks if the patient has been seen here before.
   - Caller states, “No”.
   - Staff asks what she needs to be seen for.
   - Caller states, “Fever and feel fluey.”
   - Staff checks the appointment book (follows center policy on triage of scheduling patients, and for our purpose, can get her in today). Staff offers caller the
appointment time.
- Caller accepts time.
- Staff asks her name, and writes it in the open appointment time in the appointment book that they have agreed upon.
- Staff asks for date of birth and contact information and writes it in, along with reason for appointment.
- Staff instructs caller to come in 15 minutes early for paper work.
- Staff asks if she knows how to get to the clinic.
- Caller states, “Yes.”
- Staff repeats back the appointment time as she double checks it in the book.
- Staff thanks the patient for calling.
- Since it is an add-on for today, she lets the CMA/Nurse in back know about the appointment.
- Front desk staff starts putting chart together with information she has.

When we analyze this process, we note that at times the nurse has already added in some patients for that same day. Ideally, the front desk should check with the nurse before adding in another patient in a busy day.

That change would be made in the list above: the scheduler will check with the nurse before she adds in the appointment.

d. What changes will there be without a chart? In this instance, the EMR will not matter, but the PMS will. We can copy and paste our procedure from above. Then make the changes that we anticipate for EMR in green:

- The phone rings
- The person designated to answer the phone answers it. She sits at the reception desk, and doubles as check-in / check-out person.
- The caller states she wants to schedule an appointment.
- The staff person asks if the patient has been seen here before.
- Caller states, “No”.
- Staff asks what she needs to be seen for.
- Caller states, “Fever and feel fluey.”
- Staff checks the appointment book (follows center policy on triage of scheduling patients, and for our purpose, can get her in today).
- Staff checks with the nurse in back to see if the schedule can handle an additional patient today. Staff checks in computer to see if there are any openings left for the
day. There is an opening that has been held open for last minute calls or walk-ins. Staff offers caller appointment time.

- Caller accepts time.
- Staff asks her name, and writes it in the open appointment time in the appointment book that they have agreed upon and enters it into the computer. Staff completes all the fields and drop down boxes in the template for a new patient.
- Staff asks for date of birth and contact information and writes it in, along with reason for appointment.
- Staff instructs caller to come in 15 minutes early for paper work.
- Staff asks if she knows how to get to the clinic.
- Caller states, “Yes”.
- Staff repeats back the appointment time as she double checks it in the book.
- Staff thanks the patient for calling.
- Since it is an add on for today, she lets the CMA/Nurse in back know about the appointment.
- Front desk staff starts putting chart together with information she has. She can print stickers with the patient’s name and medical chart #, or whatever is in the protocol for that center for patient chart identification.

e. Again, most people do process mapping or flow charting with pencil and paper, and either write it out or draw it out. If there is a strong IT (Information Technology) presence at your center, he or she may want to do professional-looking flow charting. One caution is to avoid spending more time on making the chart than actually analyzing, changing, and improving the process.

If you must make a nice flow chart, Windows Excel has an easy template to create and develop flow charts. The web address, with some basic instructions is:


(Copy and paste this link in your web address bar)
Key Point: Each task on the center’s task list will go through work process analysis to achieve optimal efficiency and benefit from the HIT implementation. While many IT processes will be standardized at the network level, each center will:

- Map out every work process currently utilized at the center (pre-EMR)
- Assess each process with a fresh eye and open mind
- Utilize perspectives from all involved disciplines
- DISCARD ASSUMPTIONS that are limiting in any way
- INVENT or ENGINEER new processes that are lean, clean, and efficient

F. CREATING IMPROVED PROCESSES WITH AN EMR

If you would like to learn more about process mapping and work flow analysis, here are some excellent resources on these topics. We believe that the first resource below is the most comprehensive and could be your primary tool if you really work the steps in the handbook.


http://www.norc.org/6275/Module5/Patient%20Visit%20Tracking%20Toolkit%202011.11.07%20NRC%20HIT.pdf

http://www.norc.org/6275/Module5/Patient%20Visit%20Mapping%20Toolkit%202011.11.07%20NRC%20PDF.pdf

http://www.norc.org/6275/Module5/Baseline%20Data%20ToolKit%202011.11.07%20NRC.pdf
G. POLICIES AND PROCEDURES

Each of these new or revised policies and procedures must be detailed in writing and formalized in the Policy Manual. An up-to-date policy book is essential for an efficient and well-run clinic, especially when major changes are occurring. More information on this is in a later section.

**Key Point:** Each of these new or revised policies and procedures must be detailed in writing and formalized in the Policy Manual.
INConcertCare and IA/NEPCA
Health Information Technology (HIT)

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SECTION IV:
STRENGTHENING INFRASTRUCTURE
KEY POINT SUMMARY

1. The Network HIT Steering Committee will model for the rest of the staff excellent change management skills. Decisions will be made with the vision and goals at the forefront and with ample feedback and communication gathered from staff. The success of the whole Network through improved patient outcomes and operational efficiencies will be the driving motivation throughout the project.

2. Even if your center is one of the last to “Kick-Off” and finally “Go LIVE,” it is IMPERATIVE that each Center Implementation Team starts meeting now and adheres to the following outline in sync with the rest of the Network.

3. A Risk Management Subcommittee will be formed at the network level with a strong IT component, to address all risk management issues and to ensure 100% HIPAA compliance and security for the HIT.
SECTION IV: STRENGTHENING INFRASTRUCTURE

A. ORGANIZATIONAL CHANGE MANAGEMENT AND TRAINING

Most experts agree that successful implementation of HIT is more dependent on effective change management and organizational leadership than on the technology itself. First, EMR adoption is usually an expensive endeavor that requires significant investment and commitment on the part of the entire organization. In addition, EMRs change the way work is done by physicians, nurses, and other allied care providers. Each group's concerns and needs must be addressed in planning, designing, and implementing a new system to avoid dissatisfaction or outright rejection of the system. The resources below provide pragmatic approaches for change management.

1. CHANGE MANAGEMENT

The adoption of an EMR system involves complex organizational change that not only involves processes and work flow, but that also significantly impacts the people themselves: the clinic staff and the providers. Because of this, leadership must manage the change process with care to offer optimal support to the success of the project (and the people working with it).

Change management is a process that differs with every organization and with every significant change. For CHCs working through a networking implementation, not only must the network implement a complex change strategy, each individual center will also have to adjust with its own unique change management techniques.

As a Network, we will determine to what level we standardize documentation (and therefore process, to a degree) to achieve best practices, optimal data analysis, and better health outcomes. We also need to determine what needs to be fluid and molded to fit each unique center with its specific services and patient population. Some changes that we know ahead of time we will be addressing include:

a. The ability to access and manage patient information
b. Re-design of organizational work flow  
c. Effects on staff and providers, both during the transition and in the long-run  
d. Changes in provider and patient interactions  
e. The need for continuous modifications of the EMR to respond to changing needs and populations served by the health center

Each individual staff member will have changes in job tasks and responsibilities. The number of changes and the ramifications of the changes can become overwhelmingly stressful on employees. Common responses include, “But we have always done it this way,” and, “Why fix something that is not broken?”

The reality we have to accept at the onset is that, for the EMR implementation to succeed, tremendous change will have to occur and be successfully absorbed by staff. It is important to remember that we chose this to improve our patient care and to dissolve health disparities at our community health centers. As we change our processes, procedures, and job descriptions we need to remember that it is for the benefit of our services, and therefore for the benefit of the patients and even the staff.

2. **DIFFERENT TITLES, DIFFERENT ROLES**

Health centers and the Network each have different levels of management, including executive, mid-level, and front-line workers. Each has varying levels of authority and sometimes overlapping functions, which sometimes makes the chain of command unclear.

When it comes to EMR implementation, however, we want to define roles clearly so that accountability and boundaries are not a cause for confusion.

- **Network HIT Steering Committee:** This is the team that drives the implementation project. They set priorities, manage staff training, and address problems. The Steering Committee is also responsible for getting staff cooperation, buy-in, and commitment. The committee is responsible for ongoing clear communication, incorporating feedback from staff as well as senior leadership. They set the expectations for the outcomes of the EMR implementation at a high, yet realistic, level for the whole user community.

- **Executive Directors:** As senior management, communication of how the EMR vision will look in reality is a primary function. Senior management makes the ultimate decisions that have financial and operational impact on their center, so it is vital that they are integrated throughout the process. They serve as lead in coordinating understanding and buy-in of all staff throughout the process, so there are no big surprises
or conflicts when progress is well-advanced.

- **Mid-Level Management:** Supervisors and team leads can help promote a positive attitude with staff and providers, and help settle anxieties (or outright resistance) among staff. If there are real concerns at the front line about a decision, these managers can take them to the proper individuals to find resolution.

- **Specialty Sub-Committee Members:** These people get down to the detail level of processes, and need to be willing to speak out about what will and will not work in the clinic environment. They should have a high level of expertise in their area, yet have an open mind and be willing to look at significant change in work processes with the EMR.

- **Center Implementation Team:** This multi-disciplinary team works under the direction of their Executive Director and Medical Director, and under the guidance of the Network HIT Implementation Steering Committee. Primary responsibilities include examining work flow and identifying specific changes and improvements to optimize the potential of the HIT system in their own center.

### 3. Managing Resistance

Resistance is an expected component of change. Giving up old ways causes grieving; learning new ways can challenge one’s confidence and one’s patience. Because so many peoples’ identities are strongly tied to their work, the changes can feel threatening. This vague and less than rational feeling of being threatened can cause unexpected and uncharacteristic changes in behavior, even in the professional setting. The best mode of prevention is to have full participation of staff in the decision-making processes.

Other suggested strategies include:

1. Ensure staff and providers are well-informed throughout the entire process.
2. Answer questions and clarify confusion in a transparent and non-threatening manner.
3. Create frequent opportunities and avenues for staff to ask questions and offer input.
4. Encourage increased communication between management and staff within centers regarding adoption and implementation.
5. Support staff involvement actively throughout the project.
6. Listen sincerely to questions, suggestions, and concerns, and address through the appropriate channels (e.g. the Steering Committee)
7. Use your creativity and positive attitude to create an environment that offers safety and adventure with change.
B. MAKING TOUGH DECISIONS

1. As was stated early in this project manual, a critical step in this project was developing specific and clearly-defined organizational objectives: a work plan with tangible, do-able milestones, and objective, measurable positive outcomes. The key is to “keep your eye on the ball.”

2. A common error in many implementation processes has been to focus on the technical factors of the EMR implementation while ignoring the even more critical human factors. While technological mini- (or major) crises are bound to occur in the process, they are usually much easier to resolve than human challenges, such as power struggles, competitive mindsets, and closed or judgmental mindsets. The most important factor in making positive, effective clinical or operational decisions is to have the right individuals with the right information, the right expertise, and the right attitude, making the decisions.

3. In making the tough decisions, we need to keep our minds focused on our mutual mission. The most important facets of a successful implementation include:
   - Motivation
   - Vision
   - Leadership
   - Project management skills
   - Open-ended and creative work flow re-design processes
   - Continuous and ongoing staff training
   - Ample IT support
   - Ongoing evaluation of goals and objectives in support of an advanced technological health care system

Key Point: The Network HIT Steering Committee will model for the rest of the staff excellent change management skills. Decisions will be made with the vision and goals at the forefront, and with ample feedback and communication gathered from staff. The success of the whole Network will be the driving motivation throughout the project which will result in improved patient outcomes and operational efficiencies.
C. **STANDARDIZATION** of required data fields, consistent terminology and definitions, and even of clinical decision making, can lead to optimal outcomes, along with optimal data gathering. If these standards can be reached by consensus early in the planning process, and built on throughout the planning, designing, and implementation, it will be a simple and natural standardized process to compare and demonstrate the outcomes.

1. **One Crucial Measure of Success** -- Even within one center, it is often challenging to find providers who agree on standards of care and documentation. In a network, with multiple centers and exponentially more providers, the level of standardization we achieve will be a clear indicator of our dedication to the mission and vision of the EMR. Our level of standardization will be one transparent and clear measurement of our success: our ability to quantify data, correlate with standard practice, and make tangible improvements. There is more background and specific information on standardization in the following section.

D. **GATHERING MEANINGFUL DATA** -- There may be a general determination made for all patients; or different specifications for different types of patients (e.g. chronic disease registry patients, obstetrical patients, or behavioral health patients). Ideally, these guidelines should be standardized among centers and providers to the greatest degree possible. Standardization will allow more accuracy and broader reporting potential; a sense of certainty for providers and staff members alike that the data one is looking for or needing will be there; and, avoid the need for any hasty decisions when anxious patients are waiting. Providers often need to make exceptions for individual patients, but the exceptions should generally be to retain more data, rather than less than the guidelines state. This is the type of major decision that the Steering Committee will be called to make during the course of this project.

E. **DATA INPUT AND SCANNING** -- Eventually, designated items from all of your active charts will be scanned into the system. The HIT Implementation Steering Committee will be discussing the level of standardization for this within the Network that would be optimal. Once the determination is made at the Network level, some of this work may be completed prior to your center’s “Kick-Off.” Here are some questions under consideration when going from paper charts to an EMR. There is external guidance and recommendations on this, which will be shared by the Network Steering Committee as we come to discuss this as a Network.
1. What charts will be scanned in ahead of time – going how far back?
2. What types of documentation from the charts will be scanned into the system?
3. Do scanned materials – or not scanned materials – need to be reviewed by a provider? If so, which ones?
4. What is the current procedure for ongoing scanning? What changes do we want for that with implementation of the EMR?
5. Who will be in charge of the scanning [role/position(s)]?
6. Timelines?
7. What data from previous charts must be entered into the system so that our database is current?
8. What is the procedure for this?
9. Timelines?

**Key Point:** At least six months before the first center’s “go live” date, the Steering Committee must determine what documents in established patient charts will be scanned, what paper documents will be saved and stored, and what data will be entered into the system ahead of time. Centers will follow the guidelines provided the Network HIT Steering Committee regarding data entry and scanning of historical data. The Committee will set the minimum standard; providers may have more data than that in the EMR but not less.
F. **RISK MANAGEMENT, PRIVACY, AND SECURITY**

1. **TYPES OF RISKS AND TOOLS FOR PROTECTION** -- As more health care information becomes available in electronic format across health care organizations, the concerns about privacy and the ability to protect patient information on a confidential basis has become increasingly important. Thus, this section is designed to equip you with the tools necessary to prevent against security risks and establish effective methods for maintaining the privacy and security of your EMR. Included is an explanation of risks you may encounter and how to mitigate these risks, how to assure the security of vendor- or ASP-sponsored EMRs, how to address patient and outside requests to view EMRs, how to secure wireless networks and prevent hacker attacks to the system, and how to manage EMRs effectively within your health Network.

2. **DIFFERENT RISKS WITH HIT** -- Implementing an EMR inherently changes the way in which information is managed. This includes the scope of activities necessary for managing the security of EMR data. EMRs have a number of security features that will require new administrative procedures for implementing and managing. For example:

   a. **Privilege management**: Privilege management refers to the process of managing users and their rights to access specific EMR features and data. Most EMR access control is based on role and privilege assignments. Some EMRs predefined roles while others allow the customer to create their own roles. Roles can be thought of as unique sets of features that occur across users. Individual users are assigned to one or more roles and inherit the user privileges that belong to the assigned role. Roles are typically defined when the EMR is first configured and periodically updated. The primary ongoing maintenance activity is to modify the user assignments as needed to respond to staffing changes. Role definition and creation is usually assigned to the EMR support staff, but user assignments can be performed by the office or HR managers.

   b. **Audit**: An EMR system will provide a detailed record of access and modification to patient records. These logs play a vital role in the ongoing security management of the EMR system but only to the extent that the logs are routinely reviewed. With appropriate training, review of the access log for security purposes can be assigned to office or medical records staff or left to the EMR support staff.
3. **Risk Management for HIT:** There are five common types of risks. These include:

a. Inappropriate access
b. Record tampering
c. Record loss due to natural catastrophes
d. Record degradation
e. Technology obsolescence

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a. **The Risk of Inappropriate Access:**

With electronic records, inappropriate access manifests itself in one of two ways:

- An unauthorized user gains access to the EMR data; or,
- An authorized user violates the appropriate use conditions. For example, office staff accessing the records of a friend or colleague that visited the practice.

Protecting against inappropriate electronic access is accomplished by having an effective access control process. Access control includes four separate activities.

- **Identification:** Issuing access credentials (user name, password, biometrics, tokens, smart cards) to authorize individuals
- **Authentication:** Validating that the credentials presented at log-in are authentic
- **Authorization:** Verifying that the individual has legitimate need to access the record
- **Audit:** Reviewing access logs for suspicious activity

Electronic records are subject to 'serendipitous' access such as when a user account is left open and a passerby is able to view data on the screen or manipulate the EMR features. Proper user training, automatic log-off, and screen savers are all techniques to reduce this type of risk.

Electronic records are subject to breaches of network security which may allow a hacker to gain access to user credentials and thereby bypass the access control protections. There are numerous examples of data breaches occurring through intentional hacker attacks.

All staff should clearly understand the legal ramifications of unprofessional access or utilization of EMR data for which they are not professionally responsible. As with any breach of confidentiality, a breach via the EMR can lead to serious disciplinary repercussions, possibly including termination.
Mitigation
Regardless of record format, the risk of inappropriate access is mitigated by implementing a reliable process to ensure that keys, entry badges, or electronic credentials are only available to authorized persons. A major challenge to maintaining security of the system is ensuring all user credentials are accurate and up-to-date by making timely modifications to reflect changing user status.

For electronic records, access control may be fine-grained and set at the level of individual records or even data elements. Some EMR systems support a broad range of role definitions and corresponding use privileges.

b. The Risk of Record Tampering

Medical records can be altered in a number of ways, including back dating, fraudulent entries, erasures, or modifications. The ability to make changes to an electronic record depends upon the rights assigned to a user. Users with data modification privileges can generally add, delete, or modify data or entire records. Data can also be tampered with by directly accessing the files stored on the EMR servers using a server account rather than an EMR user account.

Mitigation
For electronic records and files, several techniques exist to prevent or detect tampering. A digital signature can be applied such that if data is added, deleted, or changed in even the most discrete manner, the validation test fails. There are different software applications that can run a validation test and this will raise an alert/warning to note that a document has failed the test. Additionally, electronic records can be restored to the last valid date by use of backup files and recovery techniques. Access audit logs can record information about the user, time, and date of any or all record changes.

c. The Risk of Record Loss Due to Natural Catastrophes

Fires, floods, or other environmental disasters can result in the complete loss of medical records whether paper or electronic. Environmental risks attack the physical locations and generally impact paper and electronic records equally.
Mitigation
The most effective risk mitigation strategy is to maintain duplicate records at off-site storage locations that are unlikely to be affected by the same disasters as the primary sites. Paper records are not commonly duplicated due to the associated copying time and costs. Electronic records are routinely duplicated using data backup procedures. EMR systems generally allow backup to occur automatically according to a programmed schedule. The backup data is then stored to tape, CD, or other portable media for transport to the offsite storage location. A good option for multiple sites or network models is to have a hot backup site in another region. This can serve as backup for all data in the main system, or for partial data that is more essential. The latter is the less expensive route, if it can be practical and effective for the organization.

d. The Risk of Record Degradation

Electronic records degrade catastrophically: tapes break, a bearing on a physical hard drive seizes, or optical media is scratched. Such failures can happen at any time without warning. Depending on the type of storage and the amount of damage, it may be impossible to recover the affected data.

Mitigation
For both paper and electronic media, effective mitigation is to 'refresh' the record by making a new copy. Electronic storage media have published life cycles. Backup copies provide some relief, but generally the data should be written onto new media well within the published life cycle. Media replacement should be planned and scheduled as part of ongoing EMR support activities.

e. The Risk of Technology Obsolescence

Electronic records depend upon computing technologies that have notoriously short life cycles. For the past several decades, Moore's Law and its variants have been operating with respect to computing, storage, and networking technologies. Following such laws, various performance characteristics of new computing systems double each year or two at a cost of one half that of the previous generation. This means that during the life of an average medical record, the computing technologies will have undergone multiple generational changes. With each technology generation, previous technologies lose market value and manufacturers cease production. Therefore the technology upon which the EMR
system depends will become unsustainable as replacement parts become unavailable and while operating systems and database platforms lose vendor support.

**Mitigation**

Using industry standard technologies and record formats is critical to avoiding technology obsolescence. Industry standards increase the range of products that can be used to read the data and thus provide a measure of vendor independence. Standard development groups are committed to "backward compatibility" to ensure that older record formats can be upgraded to work with the next generation technologies.

**Key Point:** A Risk Management Subcommittee will be formed through the Network HIT Steering Committee, with a strong IT component, to address all risk management issues and to ensure 100% HIPAA compliance and security for the HIT.

4. There are emerging schools of thought that CHCs should consider outside vendor IT Infrastructure Management (i.e., outsourcing). Some CHCs have worked with outsourcing providers such as VCHC or Tellurian. Other industry sectors have adopted this as a best practice and it may be a consideration for our Network in the future.
SECTION V: PREPARING FOR IMPLEMENTATION

A. Final Preparation

1. Customizing the EMR for the Center and the Network
2. Policy and Procedure Development and Revision
3. E-Prescribing
4. Providing Patients Access to Records
5. Health Information Exchange (HIE)
6. Training, Training, and More Training
7. Staffing for Training and Implementation
8. Staffing for Evolving Needs Related To HIT
SECTION V:  
PREPARING FOR IMPLEMENTATION  
KEY POINT SUMMARY

1. Each center will utilize Network-wide standardized templates and data fields. While maintaining the standardized structure, centers may add to templates or add additional data fields that are needed for that center’s specific work flow processes. Each Center HIT Implementation Team will work through the Network Steering Committee’s identified process (yet to be determined) to add requested fields or template revisions. PLEASE NOTE: It is one perspective that the EMR be used “out of the box” prior to making any customized changes to templates. The thought is that such changes add a degree of complexity to change management which is not recommended during the first few years of managing a new EMR.

2. Other important topics for consideration to assist with decision-making include: e-prescribing, a broad spectrum of patient access options including patient portals, Personal Health Records (PHRs), and Health Information Exchange (HIE).

3. All staff will need extensive training for a period of time before, during, and after implementation. Due to the temporary duplication of work, along with the frustration of learning a new system, staff should be encouraged to practice mock visits with co-workers and take time to become familiar with new processes without pressure to complete their normal full work load. There should always, to the greatest extent possible, be an expert trainer on site during the active implementation process.

4. Additional staffing, and/or decreased work responsibilities are essential for staff participating in the planning process of this project. As implementation begins, the patient schedule should be lightened (starting at 30-50% and increasing every month for at least three months is one recommendation) and extra work responsibilities should be removed so that staff can focus on a seamless and client-friendly implementation.

5. All policies and procedures will be reviewed and revised. Many will be defunct and can be archived. Those will be replaced with new HIT-related policies and procedures reflecting the center’s new and improved flow and efficiency.
SECTION V:
PREPARING FOR IMPLEMENTATION

A. FINAL PREPARATION

1. CUSTOMIZING THE EMR FOR THE CENTER AND THE NETWORK

It is likely that the software utilized by the Network will have already been customized, to some degree, for a community health center. Beyond that, the Network Steering Committee and your Center HIT Implementation Team will have some degree of flexibility in the customization of certain “templates” within the software system. The templates are designed to guide documentation for certain types of patients and certain procedures.

Centers can be standardized, initially, according to the programs that they offer, and the populations in which they specialize. Beyond that, clinicians can work together to determine what can be standardized as “best practice” across centers; and what is best left to a provider’s individual discretion.

Modifications to templates will continue to be designed and implemented after the initial “go live” as staff determines repetitive documentation areas and potential shortcuts. There will be a request and approval process for template revisions in order to maintain records and archives of templates. This is similar to how we have archived versions of patient paper medical forms in the past.

Key Point: Each center will utilize Network-wide standardized templates and data fields. While maintaining that standardized structure, centers may add to templates or add additional data fields that are needed for that center’s specific work flow processes. Each center’s P&I Team will work through the Network Steering Committee’s identified process (yet to be determined) to add requested fields or template revisions. CONSIDERATION: It is one recommendation that the EMR be used “out of the box” prior to making any customized changes to templates. Such changes may add a degree of complexity to change management which is not recommended during the first few years of managing a new EMR.
2. **POLICY AND PROCEDURE DEVELOPMENT AND REVISION**

A new system implementation will change existing processes. With a change in process, your center will need to create new policies and procedures or update existing documents. During the work flow analysis phase, an inventory of impacted policies and procedures should be completed. New policies and procedures should be developed in response to new processes and should also cover security and remote access protocols.

Aside from policies and procedures involving patient flow and documentation, all existing IT policies and procedures will need to be reviewed, phasing out those that no longer apply. A culture of safety and security can be an ongoing vision and goal throughout the planning and implementation phases and beyond. For example, it is important to have a comprehensive policy in place around IT procedures, such as a 30-second automatic log-off, routine change of login passwords, and audit controls that monitor and record who is using the system and for what purpose(s).

You will also need procedures for maintaining operations when the EMR system “goes down.” Down time generally includes any period of time when the clinical system is unavailable for use. Downtime may be a result of a planned or an unplanned system outage. Policies and procedures should be created to guide users on how work should be done during the period when the system is unavailable. In addition, a process needs to be established on how the system will be updated once it is back online.

**Key Point:** All policies and procedures will be reviewed and revised. Many will be defunct and can be archived. Those will be replaced with new HIT-related policies and procedures reflecting the center’s new and improved flow and efficiency.

3. **E-PRESCRIBING**

Electronic prescribing, or "e-prescribing," generally replaces the need for handwritten, printed, or faxed prescriptions and is seen as a more accurate, safe, and efficient means of prescribing medications. The term covers a variety of methods for generating a prescription and communicating it to the pharmacy electronically. State regulations and individual pharmacy capabilities determine when written or faxed prescriptions are still required.
- **Key Benefits**
  CMS estimates that between 5% and 18% of U.S. physicians use e-prescribing. This percentage is projected to grow by 10% every year over the next five years. Between 70% and 75% of the 57,208 pharmacies across the United States already have e-prescribing capabilities. The growth is driven by the real, substantial improvements in patient care as well as improved work flow in the physician and clinic offices.

- **E-Prescription Networks**
  Over 70% of community and drug store pharmacies are connected to an e-prescription pharmacy network. The two largest networks, which may be in the process of, or have already completed merging, are:
  - **SureScripts**, created by the [National Association of Chain Drug Stores](http://www.nacds.org) (NACDS) and the [National Community Pharmacists Association](http://www.nasha.org), which provides real-time access to community pharmacies
  - **RxHub**, which is an effort by three pharmacy benefit management companies:
    1. Advance/PCS (acquired by [CVS Caremark](http://www.cvs.com))
    2. Express Scripts
    3. Medco Health Solutions
  RxHub uses routes and switches to send prescriptions primarily to large mail order pharmacies. Although there are technological differences, each offers similar services including patient prescription benefits, eligibility verification, and patient history of medications and allergies.

- **Medicare Part D Encourages E-Prescribing**
  CMS has released final e-prescribing regulations for Medicare Part D participants. These regulations do not mandate the use of e-prescriptions by physicians and pharmacies; however if e-prescriptions are used then the CMS standards must be followed.
The final e-prescribing rule was published at the Federal Register on April 7, 2008. The final rule provides three electronic tools for use in e-prescribing:

- **Formulary and benefit transactions**: gives prescribers information about which drugs are covered by a Medicare beneficiary's prescription drug benefit plan.
- **Medication history transactions**: provides prescribers with information about medications a beneficiary is already taking, including those prescribed by other providers, to help reduce the number of adverse drug events.
- **Fill status notifications**: allows prescribers to receive an electronic notice from the pharmacy telling them that a patient's prescription has been picked up, not picked up, or has been partially filled, to help monitor medication adherence in patients with chronic conditions.

The final rule also adopts the National Provider Identifier (NPI) for e-prescribing under Medicare Part D, and retires NCPDP SCRIPT 5.0 in favor of the upgraded NCPDP SCRIPT 8.1 which went into effect April 2009.

- **E-Prescription Rules**
  - E-prescriptions may no longer be sent to pharmacies using a computer generated fax but must instead comply with the new standards as of January 1, 2009. The standards cover four categories of information:
    - Formulary and benefits;
    - Medication history;
    - Refill status notification; and,
    - Provider identifiers

- Physicians and pharmacies are not mandated to use e-prescriptions. The standards require real-time processing of the prescription information which should streamline prescribing work flows, and eliminate a great deal of the insurance company and pharmacies calls back resulting in true cost savings. CMS optimistically estimates the new standards will save $4 billion dollars by 2013.

- The Drug Enforcement Administration does not allow e-prescribing of controlled substances. Although the agency has offered several proposed regulations to remove this ban, so far none have made it past the internal review process. This means physicians will continue to use the triplicate form procedures for such medications.
4. **Providing Patients Access to Records --** There are three distinct ways to satisfy a patient's request for electronic access to their medical records.

   a. **Patient Portals --** A patient portal allows patients to access some EMR resources through a web interface. Typically, only the least sensitive portion of the EMR is made accessible to patients such as appointment schedules, current medications, and negative test results. Patient portals sometimes allow patients to update contact information, provide their annual history information, and send emails to clinicians.

   Patient portals create significant risk and thus require substantial efforts to ensure they are appropriately secured.

   b. **Partnering With a Personal Health Record (PHR) Provider --** There are a number of high profile vendors that provide patients with low-cost or free personal health records. The PHR is a repository for medical information received from the patient's current and previous providers. From a security perspective, an advantage of these PHR systems is that they are maintained by vendors who have the resources to dedicate staff to professionally manage the PHR system. Partnering with a PHR vendor carries substantially less risk than does provisioning a patient portal.

   c. **Give Electronic Records Directly To the Patient --** There are no extraordinary security concerns in giving electronic records directly to the patient. In principle, providing the patient with an electronic copy of his or her own records is no different than releasing paper copies to the patient.

5. **Health Information Exchange (HIE) --** This is a broader system of interfaces throughout an entire community, so that a doctor, dentist, mental health worker, social worker, hospital, pharmacy, or outpatient surgical facilities can access patient records only as needed and appropriate. This is the broader, long-term goal for HIT for the health and convenience of the community population.

**Key Point:** Other important topics for consideration to assist with decision-making include e-prescribing and a broad spectrum of patient access options, including patient portals and PHR providers and health information exchange (HIE).
6. **TRAINING, TRAINING, AND MORE TRAINING**

A comprehensive training program is the cornerstone of most successful implementations. Oftentimes the reason for limited adoption is a function of users not being appropriately trained and supported in their first use of the new system. As with any technology implementation, careful consideration should be given to basic IT skills as this will guide the training program that will be developed. It is critical that training should be viewed as an ongoing activity and not something an organization does as only part of the implementation phase of a new clinical or practice management system.

There are numerous factors to consider when developing a comprehensive training plan. Training plans should include instruction on how to use the new system as well as orientate staff to any new or changed policies and procedures. A comprehensive plan should include the following:

- Details on training that will be completed before, during, and post go-live
- Details of the different user roles and training requirements for each of those roles i.e. health care professional, system administrator, and super user
- Describe how the training will form part of a larger competency program
- Describe how training will be provided as an ongoing activity. For example, clinical system training may be part of new employee orientation.

Once a new information system is implemented, organizations need to put in place an ongoing plan to ensure that all new staff receives training on the system when they are hired and that at periodic intervals users receive refresher training. It may also be necessary to print various materials, including pocket-sized quick reference guides on how to use the new system.

**Key Point:** All staff will need extensive training for a period of time before, during, and after implementation. Due to the temporary duplication of work, along with the frustration of learning a new system, staff should be encouraged to practice mock visits with co-workers, and take time to become familiar with new processes, without pressure to complete their normal full work load. There should always, to the greatest extent possible, be an expert trainer on site during the active implementation process.
7. STAFFING FOR TRAINING AND IMPLEMENTATION

Members of the Network HIT Steering Committee, members of the center specific Center Implementation Teams, and members of specialty sub-committees will all need dedicated time away from their normal work role both for meetings as well as administrative time for “homework assignments” of research reading and writing. It is not possible for employees to do their job well with all of these additional responsibilities. It is essential that managers find a way to either increase staffing or decrease work duties of employees as they are putting time and energy into this very important project.

There is also anticipated decrease in productivity during training and especially during implementation of both the PMS and EMR. Again, a combination of increased staffing and a decreased patient schedule and lightening of work assignments is essential for a successful implementation.

**Key Point:** Additional staffing and/or decreased work responsibilities are essential for staff participating in the planning process of this project. As implementation begins, the patient schedule should be lightened (starting at 30-50%, and decreasing every month for at least three months), and extra work responsibilities should be removed so that staff can focus on a seamless and client-friendly implementation.

8. STAFFING FOR EVOLVING NEEDS RELATED TO HIT--- Some center employees may be concerned about potential job loss with some of the extra functions provided by HIT. This has not been demonstrated in other implementation processes. While there may less need for some specific positions, such as those focused on billing and coding, there are ample other tasks and positions that arise from the PMS and EMR. Medical Records staff can generally be utilized in HIT related duties. Thus, while some individual’s job descriptions and responsibilities may be altered, there is generally no cause for concern of down-sizing or lay-offs due to HIT implementation.

**Key Point:** There is generally no cause for concern of staff lay-offs or downsizing in health centers due to HIT implementation.
SECTION VI: ROLLOUT -- GOING LIVE
KEY POINT SUMMARY

1. Test ALL applications and procedures before initiating the “Go Live” transition.

2. A special work plan is needed for the transition period when both the HIT system is working and the paper chart is being utilized.

3. The “Go live” date is truly just a formality as the EMR will have been in use for several months before that date.
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SECTION VI:
ROLLOUT -- GOING LIVE

A. APPLICATIONS TESTING

Comprehensive System Testing is a key process for a successful go-live. Testing should be methodical and begin months before the go-live date. This is an area where the vendor may take the lead and provide testing scripts as well as a plan for execution. Normally the vendor plan is limited to their application so additional test scripts will need to be developed if the system will be integrated with other applications.

It is crucial to conduct a comprehensive system test prior to going live with the system. In addition to testing the various aspects of the application, a full system test includes any other systems that are integrated with the new clinical system, for example, a practice management system that is being integrated with an EMR. To test a system end-to-end, various test scripts or scenarios should be developed. The staff assigned to testing the system should ensure that they are able to complete all the test scripts without any issues. All issues that are encountered should be documented and resolved with the aid of the vendor. System backups and downtime procedures should also be tested and validated.

Once testing is complete you should get sign off from the various individuals involved with the testing before you can initiate the go-live.

**Key Point:** Test ALL applications and procedures before initiating the “go live” transition.
B. **INCREASED STAFFING; DECREASED PRODUCTIVITY**

As part of the “go live” planning, the Network and the centers will need to determine what additional resources will be required to support the activation of their clinical system. The vendor will normally provide some support during the go-live and this should be outlined during the contract negotiation phase. In addition to the vendor support, you may require additional staff to assist with training, working out process issues, and dealing with any unexpected technical glitches. The plan that you develop for the go-live should include a schedule that ensures that different resources are available throughout the initial go-live.

You should also plan on significantly decreased productivity, so it is wise to schedule accordingly. There are indications that productivity can be decreased by as much as 50% in some centers. If extra time is allowed in the schedule for each patient, both staff and patients will feel less stress and pressure.

Some recommendations for planning for decreased productivity are as follows:

- **Month One** – 30% reduction
- **Month Two** – 20% reduction
- **Month Three** – 10% reduction

C. **PILOT PHASES**

Pilot studies by application or consent may be done as part of a phased go-live. During the pilot, an organization can assess in a smaller, more defined setting whether the system is working as expected and what additional refinements in process are required to ensure a smoother transition to the new system. During the go-live planning it is important to outline how the pilot will be conducted as well as the expected outcomes. Pilots are normally conducted for a well defined period of time during which an assessment can be made of whether the new system adequately supports various clinical processes, how usable the application is, whether additional training is required, what other policies and procedures may need to be developed, and finally, refinement in how the application is currently configured.
D. **DOUBLE DUTY**

For a period of time determined by each center, with input from the Steering Committee if desired, your center will likely maintain the paper chart as well as the EMR. This will serve as a back-up for any unanticipated glitches, allow staff to see for themselves how the two compare, and serve as a confidence builder for uncertain staff and providers.

This period will require a work flow process and timeline all its own. You will primarily use the processes created for the EMR, but document in the chart, also, for a back-up system. It is also quite common and also more efficient to print out visit records from the EMR and file them in the chart. During this time, it is important to remember that the paper chart is still the “chart of record.” This will also give staff an opportunity, for each patient that comes in, to scan the paperwork that has been pre-determined by the Steering Committee, the Center Implementation Team, and/or the provider for a specific patient.

**Key Point:** A special work plan is needed for the transition period when both the HIT system is working and the paper chart is being utilized.

E. **EMR STANDS ALONE**

At the time each center, or set of centers, formally determines it, there will be no new paper forms in any chart. This is the “Go Live” date: the formal date that the EMR becomes the actual legal medical record of the patient. At this point, the date will be a formality only, because the center will have been utilizing the EMR for at least several months.

**Key Point:** The “Go live” date is truly just a formality, as the EMR will have been in use for several months before that date.
INCONCERTCare and IA/NEPCA
Health Information Technology (HIT)

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SECTION VII:
EVALUATING, OPTIMIZING, AND SUSTAINING

For years, HIT has been implemented with the goals of improving clinical care processes, health care quality, and patient safety. However, plans to evaluate and optimize have historically taken a back seat to project work, or have been omitted altogether, at a tremendous loss to the HIT field. HIT projects require large investments and stakeholders increasingly are demanding to know both the actual and future value of these projects. As a result, the field has moved away from talking about theoretical value to a place where we measure real value. We have reached a point where isolated studies and anecdotal evidence are not enough for our stakeholders or for the health care community at large. Evaluations must be viewed as an integral piece of every project, not as an afterthought. A variety of resources can help to inform our evaluations and enable our health centers to optimize the success of our HIT implementation.

Prior to beginning an evaluation of our HIT implementation, it is important to reflect upon the project's goals and identify features we would like to measure. It may be most helpful to identify an ideal measure or measures for each goal. For example, if one of our project goals is to improve patient safety, our measurement may be the number of preventable adverse drug events. Our evaluation will help to determine whether the number of preventable adverse drug events decreased prior to post-implementation of our EMR.

There are a wide variety of metrics available to evaluate all aspects of our HIT implementation: clinical outcomes measures, clinical process measures, provider adoption and attitude measures, patient knowledge and attitudes measures, work flow impact measures, and financial impact measures. Keep in mind that a thorough evaluation will explore the clinical impact of the implementation as well as the impact on the community and broader health care system.

Ideally, an evaluation will utilize both qualitative and quantitative metrics to explore project impacts and outcomes. Frequently, evaluations of HIT implementation rely heavily on quantitative data. While quantitative studies will provide evaluators with data on rates and percentage changes post-implementation, a single-pronged evaluation strategy may not be able to answer questions about usefulness and usability. Qualitative studies add another important dimension to an evaluation because they enable evaluators to understand how well the user interacts with the new system. Qualitative studies also speak to a larger audience because they are generally easier to understand. Thus, an evaluation should use a good balance of quantitative and qualitative methods to evaluate implementation.
To have the most impact, evaluation results should be used to inform the health center's strategy for continuous quality improvement given its goals and priorities. The evaluation results provide an important opportunity for reflection and dialogue about the current state of the HIT implementation and potential next steps. The evaluation can also be used to facilitate continuous quality improvement and ensure that the HIT project is meeting its objectives efficiently.

An evaluation determines how well a HIT project meets its purpose and objectives. Evaluations allow us to analyze our predictions about our projects and to understand what has worked and what has not. Lessons learned from evaluations help everyone involved in HIT implementation and adoption improve upon what they are doing. In addition, evaluations help justify investment in HIT projects by demonstrating project impacts and outcomes.

Once the EMR is installed and a post implementation evaluation is completed, the organization can now change the focus on how the quality of patient care can be improved utilizing data and reports from the system. Especially in the network based model, with our integrated standardization of definitions and required data, HIT offers new opportunities to collect and track patient information.

With interoperability and appropriate interfaces in place, we can retain historical data and maintain the most positive aspects of “pre-HIT” health care. For example, most EMR products are linked to chronic disease management registries. These registries have the capability of processing large amounts of data and generating reports at the point of care and between visits and help providers manage their patients more effectively. Thus, the new technology will not leave the old data behind if the job is done right.

The key to a successful implementation and operation of an EMR is comprised of two primary categories: technology and people. The latter is the most important for success, because the former is useless without it. Experience has shown that people accept change best when:

- They clearly understand the change, including the steps involved, and how it will affect them and their co-workers.
- They feel they have a voice that is heard in the planning process.
- They have adequate training.
- There is a culture of trust, transparency, and honesty.

Those factors are the sum total of the purpose of this Network HIT Implementation Manual. Please refer to it frequently with that purpose in mind. Those factors are key to the evaluation of the EMR and the implementation.
INConcertCare AND IA/NEPCA
HEALTH INFORMATION TECHNOLOGY (HIT)

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SECTION VIII: SUMMARY

We embarked on this journey because so many external factors (national health care reform, federal funding, legislative initiatives, and financial incentives) and internal factors (need for increased connectivity between centers, need for improved definitions and standards for meaningful data collection, and a mandate to offer services at an equal level with health care providers from the private sector) all converged upon us at a fast and furious pace. The momentum of this powerful convergence pushed us to move forward at a nearly frantic and frenetic, yet exciting pace.

We are all in this “FQHC / CHC / PCA” work environment together with wonderful intentions and sometimes passionate fervor. Yet in this people-focused environment, the implementation of health information technology (HIT) at the center and Network level is likely one of the most challenging professional accomplishments many of us have ever undertaken, or perhaps ever will. We deeply hope that at the end of this project (though many say it has no end), we will all have a sense of pride, accomplishment, and maybe even a feeling of family within our CHC Network.

This project which we are undertaking is a master task of technology, medicine, finance, demographics, statistics, communication, and, most of all, people working with people. That is what makes the task before us so monumental, and so complex. This is the test where we find out if we can really keep focused on our common goal: we are here to help people. We want to significantly improve health outcomes, especially for our patient population.

Another goal, perhaps, is to work together to make this project the growth experience of a lifetime. Perhaps we can make this implementation, with its multiple layers of complexity, unfold as we truly desire, the way that we really think it should. If this project is developed and implemented with thoughtful care, mutual respect, and a vision for providing the very best for the good of all, that is likely what it will generate for patients and staff for years to come.

Now that would be a true success.
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GLOSSARY OF HEALTH INFORMATION TECHNOLOGY TERMS

3G (Third-Generation) Network: Advanced cellular network supporting data transfer speeds from 144kbps to 2Mbps (theoretically). Cellular carriers hope to use 3G service to deliver advanced features such as Web browsing and streaming video.

802.11b: A wireless networking standard ratified by the IEEE in late 1999 and supported by the largest wireless local area network (WLAN) vendors. Also known as Wi-Fi.

Access Point: Radio-based device that provides users of wireless devices with access to a local area network (LAN).

AHIC (American Health Information Community): Also known as "the Community." It formed to help advance efforts to reach the president’s call for most Americans to have electronic medical records by 2014. See www.hhs.gov/healthit/ahic.html

AHIMA (American Health Information Management System): A community of professionals engaged in health information management, providing support to members and strengthening the industry and profession. See www.ahima.org

AMIA (American Medical Informatics Association): The first professional group to issue guidelines for physician-patient e-mail.

AMR (Ambulatory Medical Record): A computer system for storing, managing, and retrieving electronic patient health information in the outpatient setting. In the inpatient setting, it is often referred to as an electronic medical record (EMR).

AHRQ (Association for Health Research & Quality): Provides best practices for health care quality, safety, and efficiency. Is the leading organization in assisting health care providers implement health information technology

ANSI (American National Standards Institute): The U.S. standards organization that establishes procedures for the development and coordination of voluntary American National Standards.

Architecture: This term refers to the structure of an information system and how its pieces communicate and work together. Also see client/server and tiered architecture.
ARRA (American Recovery and Reinvestment Act of 2009): The American Recovery and Reinvestment Act is an unprecedented effort to jumpstart our economy, save, and create millions of jobs, and put a down payment on addressing long-neglected challenges so our country can thrive in the 21st century. ARRA is investing significant resources into providing funding for HIT resources for the health care community.

ASP (Application Service Provider): A business that deploys, hosts, and manages access to software applications for multiple parties from a central facility. The ASP charges a subscription fee to users of the applications, which are delivered over the Internet or other public or private networks.

ASTM International (American Society for Testing and Materials): Was formed over a century ago, when a forward-thinking group of engineers and scientists got together to address frequent rail breaks in the burgeoning railroad industry. Total standards developed at ASTM are the work of over 30,000 ASTM members. These technical experts represent producers, users, consumers, government, and academia from over 100 countries. Participation in ASTM International is open to all with a material interest, anywhere in the world. [http://www.astm.org](http://www.astm.org).

Bandwidth: A measure of how much information can be transmitted at once through a communication medium, such as a telephone line, fiber-optic cable, or radio frequency.

Beaming: Transfer of data or software programs between devices, such as PDAs, personal computers and printers, using either infrared or radio-wave transmission.

Bioinformatics: The science of developing and using computer databases and algorithms to hasten and improve biological -- and pharmaceutical -- research.

Biometric Authentication: Technology that identifies a person through recognition of unique physical characteristics, such as retina or iris patterns, face shape, voice patterns, or fingerprints.

Bluetooth: A protocol designed for short-range wireless communication or networking among a variety of devices; somewhat similar to, but distinct from, 802.11b.

Broadband: A medium that can carry multiple signals, or channels of information, at the same time without interference. Broadband Internet connections enable high-resolution videoconferencing and other applications that require rapid, synchronous exchange of data.

Browser: A software program that interprets documents written in HTML, the primary programming language of the Web. A browser such as Netscape Navigator or Microsoft Explorer is required to experience the photos, video, and sound elements on a Web page and assists in quick, easy travel around the Web.

C+/C++: C is an established programming language found in many operating systems, including UNIX. C++, a daughter program based on objects, is quickly becoming a favored programming language as object-oriented technology gains popularity. Also see Java.

CCHIT (Certification Commission for Healthcare Information Technology): A voluntary, private-sector
organization launched in 2004 to certify health information technology (HIT) products such as electronic medical records and the networks over which they interoperate. See www.cchit.org.

CCR (Continuity of Care Record): A standard specification being developed jointly by ASTM International, the Massachusetts Medical Society (MMS), the Health Information Management and Systems Society (HIMSS), the American Academy of Family Physicians (AAFP), and the American Academy of Pediatrics. It is intended to foster and improve continuity of patient care, to reduce medical errors, and to assure at least a minimum standard of health information transportability when a patient is referred or transferred to, or is otherwise seen by, another provider. The origins of the CCR stem from a Massachusetts Department of Public Health, three-page, NCR paper-based Patient Care Referral Form that has been in widespread use for many years in Massachusetts, and from other minimal data sets both electronic and paper-based. The CCR is being developed and enhanced in response to the need to organize a set of a patient information consisting of the most relevant and timely facts about a patient’s condition. Briefly, these include diagnoses, recent procedures, allergies, medications, recent care provided, as well as recommendations for future care (care plan) and the reason for referral or transfer. The CCR will be created by a health care provider/clinician at the end of an encounter, or at the end of an episode of care, such as a hospital or rehabilitation stay.

CDS (Clinical Decision Support): Clinical decision support systems (CDSS) assist the physician in applying new information to patient care and help to prevent medical errors and improve patient safety. Many of these systems include computer-based programs that analyze information entered by the physician.

CDA (Clinical Document Architecture): Provides an exchange model for clinical documents and brings the industry closer to the realization of an electronic medical record.

CHI (Consolidated Health Informatics) Initiative: One of the 24 Presidential Government initiatives with the goal of adopting vocabulary and messaging standards to facilitate communication of clinical information across the federal health enterprise. CHI now falls under FHA.

CIS (Clinical Information System): An electronic medical record that is a clinical repository of patient data. The term CIS is sometimes used interchangeably with EMR. Typically covers:

- Pathology and radiology order entry and results reporting;
- Medication prescribing, supply, and administration;
- Clinical work lists;
- Problem lists;
- Clinical notes; and,
- Decision support

Client: In a computer network, a workstation that retrieves information from a server.
**Client/Server:** A network system in which a dedicated computer (server) handles some data storage and processing tasks for applications used on personal computers or workstations (clients), which tap the server's shared files and processing power as needed. Also see distributed computing.

**CPOE (Computerized Provider Order Entry):** A computer application that allows a physician's orders for diagnostic and treatment services (such as medications, laboratory, and other tests) to be entered electronically instead of being recorded on order sheets or prescription pads. The computer compares the order against standards for dosing, checks for allergies or interactions with other medications, and warns the physician about potential problems.

**CRM (Customer Relationship Management):** Information systems and software that enable an organization to manage customers in an organized way with the objective of building better customer relationships.

**Data:** Information.

**Data Dictionary:** A list that describes the specifications and locations of all data contained in a system.

**Data Entry:** The transcription of information from the original source into a machine-readable form. Although keyboard entry is the most familiar, other fast-growing methods include scanners and speech recognition.

**Data Mining:** Analyzing information in a database using tools that look for trends or anomalies without knowledge of the data's meaning. Mining a clinical database may produce new insights on outcomes, alternate treatments, or effects of treatment on different races and genders.

**Data Repository:** A database acting as an information storage facility. Although often used synonymously with data warehouse, a repository does not have the analysis or querying capabilities of a warehouse.

**Data Synchronization/Data Syncing:** The process of sending updates between a mobile computing device and a personal computer or application server in order to keep both sets of files synchronized. Sometimes it is called “hot syncing.” Sometimes it is spelled “synch.”

**Data Warehouse:** A large database that stores information like a data repository but goes a step further, allowing users to access data to perform research-oriented analysis.

**Database:** An aggregation of records or other data that is updateable. Databases are used to manage and archive large amounts of information. Also see relational database.

**Database Server:** A computer that stores data centrally for network users. It often uses client/server software to distribute the processing of data among itself and other workstations on the network.

**Decision Support Application:** A computer program that analyzes data and presents the information so that clinicians can make medical decisions more easily. Typical tasks of a decision support system include data
storage, data analysis, predictive modeling, and risk-adjusted comparison of actual outcomes with predicted outcomes.

**Detailing:** This is the practice which pharmaceutical representatives utilize to market drugs to physicians. Some pharmacies are turning to the Internet to perform detailing, with the ultimate goals of reduced cost and increased effectiveness. See e-detailing.

**Digital Certificate:** An electronic “certificate” (actually a unique number) that establishes a user’s identity when conducting business or other “secure” transactions on a network such as the Internet. See also electronic certificate.

**Digital Divide:** A phrase coined to describe the gap between people who have access to modern information technology, particularly computers and the Internet, and those who lack such access—or the skills to use it.

**Disease Management:** A coordinated and proactive approach to managing care and support for patients with chronic illnesses such as diabetes, congestive heart failure, asthma, HIV/AIDS, and cancer. See also e-disease management.

**Distributed Computing:** This describes a system in which multiple computers, rather than one central computer, perform computational and storage tasks. It is often used to overcome the limitations of a single computer or to exploit the unused computing power of a group of computers. Client/server systems are one type of distributed computing. See also P2P.

**DSL (Digital Subscriber Line):** A technology for delivering high-bandwidth Internet service over ordinary copper telephone lines.

**DSS (Decision-Support System):** Computer tools or applications to assist physicians in clinical decisions by providing evidence-based knowledge in the context of patient-specific data. Examples include drug interaction alerts at the time medication is prescribed and reminders for specific guideline-based interventions during the care of patients with chronic disease. Information should be presented in a patient-centric view of individual care and also in a population or aggregate view to support population management and quality improvement.

**E-Commerce:** Transactions, such as buying and selling of goods, conducted via the Internet or other network.

**E-Counseling:** Psychological therapy conducted over the Internet, via e-mail, text chats, videoconferencing, or other online communication methods. See also e-therapy.

**EDC (Electronic Data Capture):** The use of electronic technology to gather and collect, data, especially in the context of clinical trials. Allows data to be aggregated, sorted, shared, and searched more easily than paper-based records. May be Web-based, use handheld computers, etc.
E-Detailing: The use of the Internet and related technologies to perform detailing—educational/sales presentations traditionally made by pharmaceutical sales representatives to clinicians to promote prescribing of a company’s drugs.

EDI (Electronic Data Interchange): A direct exchange of data between two computers via the Internet or other network, using shared data formats and standards.

E-Disease Management: The use of Web-based technology in support of disease management to provide patient- clinician communication, patient access to information, and patient self-management. See also disease management.

E-Encounter: A type of physician-patient electronic communication that is a two-way exchange of clinical information revolving around a particular clinical question or problem specific to the patient. It may be initiated by either the patient or the caregiver.

EHR (Electronic Health Record): [one of many definitions] A real-time patient health record with access to evidence-based decision support tools that can be used to aid clinicians in decision making. An EHR is a medical record or any other information relating to the past, present, or future physical and mental health, or condition of a patient which resides in computers which capture, transmit, receive, store, retrieve, link, and manipulate multimedia data for the primary purpose of providing health care and health-related services. The EHR can also support the collection of data for uses other than clinical care, such as billing, quality management, outcome reporting, and public health disease surveillance and reporting. EHR records include patient demographics, progress notes, SOAP notes, problems, medications, vital signs, past medical history, immunizations, laboratory data, and radiology reports.

Electronic Certificate: A unique number that establishes a user’s identity when conducting business or other “secure” transactions on a network such as the Internet. See also digital certificate.

EMR (electronic medical record): [one of many definitions] A computer-based patient medical record. An EMR facilitates access of patient data by clinical staff at any given location; accurate and complete claims processing by insurance companies; building automated checks for drug and allergy interactions; clinical notes; prescriptions; scheduling; and, sending to and viewing by labs. The term has become expanded to include systems which keep track of other relevant medical information. The practice management system is the medical office functions which support and surround the electronic medical record.

Encryption: Translation of data into a code in order to keep the information secure from anyone but the intended recipient.

Enterprise Architecture: A strategic resource that aligns business and technology, leverages shared assets, builds internal and external partnerships, and optimizes the value of information technology services.

Enterprise-Wide Network: A network in which all computers in the various facilities of an organization (e.g. a health care system) are connected.
**E-Prescribing / E-Rx:** Computer technology in which physicians use handheld or personal computer devices to review drug and formulary coverage and transmit prescriptions to a printer, EMR, or pharmacy. E-Prescribing software can be integrated with existing clinical information systems to allow access to patient-specific information to screen for drug interactions and allergies.

**E-procurement:** Procurement (i.e. ordering, payment, etc.) of goods and services via the Internet.

**E-therapy:** Psychological therapy conducted over the Internet--via e-mail, text chats, videoconferencing or other online communication methods. See also e-counseling.

**Ethernet:** Probably the most commonly used standard for local area network (LAN) architecture. It supports data transfer rates of up to 10 megabits per second, although newer systems, called Fast Ethernet and Gigabit Ethernet, support transfer rates of 100 mbps and 1 gigabit (1,000 megabits) per second, respectively.

**Extranet:** An intranet that allows specified levels of access to authorized, external users.

**Fat Client:** In a client/server system, a client that performs most of the necessary data processing itself, rather than relying on the server.

**FCC (Federal Communications Commission):** The federal agency charged with regulating interstate and international communications by radio, television, wire, satellite, and cable. The FCC's jurisdiction covers the 50 states, the District of Columbia, and U.S. possessions.

**Federal Health Architecture (FHA):** A collaborative body composed of several federal departments and agencies, including the Department of Health and Human Services (HHS), the Department of Homeland Security (DHS), the Department of Veterans Affairs (VA), the Environmental Protection Agency (EPA), the United States Department of Agriculture (USDA), the Department of Defense (DoD), and the Department of Energy (DOE). FHA provides a framework for linking health business processes to technology solutions and standards, and for demonstrating how these solutions achieve improved health performance outcomes.

**File Server:** A computer dedicated to managing the flow of information among networked computers and used as a storage location for data and applications shared by network users.

**Firewall:** A security device situated between a private network and outside networks like the Internet. The firewall screens all information that attempts to enter.

**Go Live:** A largely symbolic date when the center is officially relying totally on their HIT rather than their paper documentation. Centers should be using their PMS and EMR for months before the “Go Live” date.

**GPS (Global Positioning System):** A collection of satellites that continuously transmit their positions, allowing GPS receivers to pinpoint their own geographic positions by triangulation. Used in navigation, vehicle location, and similar technologies.
GUI (Graphical User Interface): An interface that allows a person to operate a software program using visual images (called icons), drop-down menu choices, and tool bars, rather than complex keystrokes and text commands. The most common manipulating device is a mouse.

Formulary: A list of medications (both generic and brand names) that are covered by a specific health insurance plan or pharmacy benefit manager (PBM), used to encourage utilization of more cost-effective drugs. Hospitals sometimes use formularies of their own, for the same reason.

HAN (Health Action Network): Communication system used by the CDC to exchange disease information with state and local health departments.

Handheld: A portable computer that is small enough to hold in one's hand. Used to refer to a variety of devices ranging from personal data assistants, such as Palm and Visor models, to more powerful devices that offer many of the capabilities of desktop or laptop computers. Handhelds are used in clinical practice for such tasks as ordering prescriptions, accessing patient medical records, and documenting patient encounters.

HIE (Health Information Exchange): The movement of health care information electronically across organizations within a region or community. HIE provides the capability to electronically move clinical information between disparate health care information systems while maintaining the meaning of the information being exchanged. The goal of HIE is to facilitate access to and retrieval of clinical data to provide safe, timely, efficient, effective, equitable, and patient-centered care.

HIO (Health Information Organization): An organization that oversees and governs the exchange of health-related information among organizations according to nationally recognized standards.

HIPAA (Health Insurance Portability and Accountability Act of 1996): A federal law intended to improve the portability of health insurance and simplify health care administration. HIPAA sets standards for electronic transmission of claims-related information and for ensuring the security and privacy of all individually identifiable health information.

HIT (Health Information Technology): The application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of health care information, data, and knowledge for communication and decision-making.

HITSP (Health Information Technology Standards Panel): With the American National Standards Institute (ANSI), this organization of 18 independent entities serves as a cooperative partnership between the public and private sectors for the purpose of achieving a widely accepted and useful set of standards specifically to enable and support widespread interoperability among health care software applications, as they will interact in a local, regional, and national health information network for the United States.

See [wwwansiorgstandards_activitiesstandards_boards_panelshisbhitaspaspx](http://wwwansiorgstandards_activitiesstandards_boards_panelshisbhitaspaspx)
HL7 (Health Level Seven): One of several accredited standards (specifications or protocols) established by ANSI (American National Standards Institute) for clinical and administrative data. Systems which are HL7 ‘compliant’ improve the ability for interoperability and exchange of electronic data.

Home Monitoring: Use of physiologic monitors to assess patient status in the home. In some cases, results can be transmitted electronically to a case manager or physician. (e.g. Holter monitoring, implanted ECG, glucose monitoring, etc.)

Host: A computer that acts as a source of information or provides functionality for multiple terminals, peripherals, and/or users.

HTML (Hypertext Markup Language): The basic programming language for sites on the World Wide Web. This “skeleton” of code surrounds blocks of text and/or images and contains all the necessary commands and display instructions. A Web browser program is needed to interpret HTML and depict it as a graphical display on a computer screen.

HTTP (Hypertext Transfer Protocol): A language protocol used in communication among Web sites. When http appears as part of a Web site URL, it indicates to Web browsers, “HTML spoken here.”

ICD-9 (International Classification of Disease- 9th Revision): International disease classification system developed by the World Health Organization (WHO) that provides a detailed description of known diseases and injuries. The classification system is used worldwide for morbidity and mortality statistics, reimbursement systems, and automated decision support in medicine.

IEEE (Institute of Electrical and Electronics Engineering): A professional association that develops and promotes standards. The IEEE 802 standards are focused on communication protocols for wireless local area networks (WLANs).

Informatics or Information Science: The study of information. It is often, though not exclusively, studied as a branch of Computer Science and Information Technology (IT) and is related to database, ontology, and software engineering. Informatics is primarily concerned with the structure, creation, management, storage, retrieval, dissemination, and transfer of information. Informatics also includes studying the application of information in organizations, on its usage and the interaction between people, organizations, and information systems.

Internet: A publicly accessible, global network connecting millions of computers. The Internet carries data for applications such as e-mail, instant messaging and teleconferencing, in addition to the billions of documents and images that make up the World Wide Web. Although the terms Internet and Web are often used interchangeably, they are not synonymous. See also World Wide Web.

Interoperability – Compatibility: The ability of software and hardware on multiple pieces of equipment made by different companies or manufacturers to communicate and work together.
**Intranet:** An internal network that looks and acts like the World Wide Web. Intranets allow companies to take advantage of Web-based technology and create a private means of sharing data and applications among their networked users.

**ISP (Internet Service Provider):** A company that provides users with access to the Internet and the World Wide Web. Users connect to the ISP through ordinary telephone lines (dial-up connections) or through faster connections such as DSL, cable or fiber optic lines. Although some ISPs charge by the hour, most offer monthly or yearly rates.

**Java:** A platform-independent, object-oriented programming language developed by Sun Microsystems and modeled on the programming language C++. Java applets-- miniature applications designed to run within another program--now are popular features of Web sites.

**Kick-Off:** A largely symbolic event to celebrate the center’s initiation of an HIT system (PMS or EMR). The event can be celebratory, and may also be used to provide information and explanation of what the HIT systems will mean to staff, the Board, and patients.

**Laboratory Information System:** Electronic medical records are repositories of patient data either entered directly or interfaced from external applications. One such application is a Laboratory Information System (LIS) that is typically used by hospital pathology departments to record activity in the department. Typical modules include:
- Pathology request and specimen registration;
- Request and specimen management;
- Result reporting;
- Blood bank; and,
- Management reporting.
- Electronic medical records typically integrate with Laboratory Information Systems by:
  - Creating and storing pathology request details in the electronic medical record then sending them via HL7 to the Laboratory Information System
  - Storing pathology request details in the electronic medical record sent via HL7 from the Laboratory Information System
  - Storing pathology specimen collection details in the electronic medical record
  - Storing pathology results in the electronic medical record sent via HL7 from the Laboratory Information System
  - Storing blood product requests then sending them via HL7 to the Laboratory Information System, storing production allocation in the electronic medical record sent via HL7 from the Laboratory Information. Recording blood product administration in the electronic medical record. Pathology investigations generated from the LIS may be initially stored in an intermediate EMR and then sent to an EMR as part of an EMR extract such as a discharge summary.

**LAN (Local Area Network):** A network consisting of computers that are located in relatively close physical proximity to each other and are connected by wire cables, fiber optic lines, or other physical means. See also
WLAN.

**Leapfrog Group:** A group of Fortune 500 companies and other large health care purchasers founded with the goal of leveraging employer purchasing power to initiate improvements in the safety and value of U.S. health care. Leapfrog advocates the implementation of CPOE, as part of its larger patient-safety initiative.

**Legacy System:** An existing IT system or application, often built around a mainframe computer, which generally has been in place for a long time and represents a significant investment. **Compatibility with legacy systems is often a major issue when considering new applications.**

**LHII:** Local Health Information Infrastructure is a term used synonymously with RHIO. LHII was originally termed by the Office of the National Coordinator of Health Information Technology (ONCHIT) to describe the regional efforts that will eventually be linked together to form NHII (National Health Information Infrastructure).

**MPI (Master Patient Index):** A database program that collects a patient’s various hospital identification numbers, e.g. from the blood lab, radiology department, and admissions, and keeps them under a single, enterprise-wide identification number.

**NAHIT (The National Alliance for Health Information Technology):** Also known as "The Alliance" is a partnership of leaders from all health care sectors working to advance the adoption and implementation of health care information technology to achieve improvements in patient safety, quality, and efficiency. See [www.nahit.org](http://www.nahit.org).

**NEDSS (National Electronic Disease Surveillance System):** The CDC’s electronic network for disease reporting that links the agency with state public health departments.

**Network:** A general term for terminals, processors, and devices linked either by cable or wireless technology. Peripherals, applications, and data can be shared by network users.

**NHII (National Health Information Infrastructure):** Is often used synonymously with NHIN. NHII came before NHIN and is an acronym that encompasses all of the necessary components needed to make EMRs interoperable. NHIN, as the name suggests, refers to both the physical and national network needed for interoperability to occur.

**NHIN (National Health Information Network):** Describes the technologies, standards, laws, policies, programs, and practices that enable health information to be shared among health decision-makers, including consumers and patients, to promote improvements in health and health care. The development of a vision for the NHIN began more than a decade ago with publication of an Institute of Medicine report, “The Computer-Based Patient Record.” The path to a national network of health care information is through the successful establishment of RHIO.
NIST (National Institute of Standards and Technology): Founded in 1901, NIST is a non-regulatory federal agency within the U.S. Commerce Department’s Technology Administration, promoting U.S. innovation and industrial competitiveness by advancing measurement science, standards, and technology. See www.nist.gov

Normalization: The process of redefining clinical data based on predefined rules. The values are redefined based on a specific formula or technique.

NPI (National Provider Identifier): The Health Insurance Portability and Accountability Act (HIPAA) of 1996 requires the adoption of a standard unique identifier for health care providers. The NPI Final Rule issued January 23, 2004 adopted the NPI as this standard. The NPI is a 10-digit, intelligence free numeric identifier (10 digit number). Intelligence free means that the numbers do not carry information about health care providers, such as the state in which they practice or their provider type or specialization. The NPI will replace health care provider identifiers in use today in HIPAA standard transactions. Those numbers include Medicare legacy IDs (UPIN, OSCAR, PIN, and National Supplier Clearinghouse or NSC). The provider’s NPI will not change and will remain with the provider regardless of job or location changes. See: http://aspe.hhs.gov/admnsimp/faqnpi.htm

NRC: National Resource Center for Health IT

ONC (Office of the National Coordinator): Is a government agency (part of HHS) that oversees and encourages the development of a national, interoperable (compatible) health information technology system to improve the quality and efficiency of health care. See www.hhs.gov/healthit/

ONCHIT (Office of the National Coordinator for Health Information Technology): The US Department of Health and Human Services office, established in 2004, to provide leadership for the development and nationwide implementation of an interoperable health information infrastructure.

Open Source: Software in which the source code is available to users, who can read and modify the code.

PAS: (Patient Administration System) An electronic medical record may include a PAS or be interfaced to a PAS via HL7. A PAS is an application responsible for recording and reporting administrative details of a patient’s encounter in a hospital. The patient administration system typically covers modules for:

- Patient master index (PMI);
- Inpatient management;
- Outpatient management;
- Emergency management;
- Theatre management;
- Surgery waiting list management;
- Medical records tracking;
• Medical records coding;
• Inpatient reporting.

Episode details generated from the PAS may be initially stored in an intermediate EMR and then sent to an EMR as part of an EMR extract such as a discharge summary.

**Patient Record Locator:** The electronic means by which patient files are located to assist patients and clinicians to find test results, medical history, prescription data, and other health information. A record locator would act as a secure health information search tool.

**P2P (Peer-to-Peer):**
1. A network structure in which the computers share processing and storage tasks as equivalent members of the network. This is different from a client/server network, in which computers are assigned specific roles.
2. A general term for popular file-sharing systems in which there is no central repository of files. Instead, files can be stored on—and retrieved from—any user’s computer. See also distribute computing.

**PDA (Personal Data Assistant):** A handheld computer that offers relatively limited functionality and computing power. Often used primarily as organizers, but some PDAs offer wireless e-mail and Internet access. They are increasingly used in clinical practice for applications such as taking patient notes and ordering prescriptions.

**PHIT (Personal Health Information Technology):** PHIT enables the documentation of an individual's complete, lifelong health, and medical history into a private, secure, and standardized format that he or she owns and controls, but yet is accessible to legitimate providers day or night from any location.

**PHR (Personal Health Record):** An electronic application through which individuals can maintain and manage their health information (and that of others for whom they are authorized) in a private, secure, and confidential environment.

**Pharmacy Information Management System:** Electronic medical records are repositories of patient data either entered directly or interfaced from external applications. One such application is a Pharmacy Information Management System (PIMS) that is typically used by hospital pharmacy departments to record activity in the department. Typical modules include:

• Script registration;
• Dispensing;
• Clinical decision support including interaction checking;
• Inventory control; and
• Management reporting.
• Electronic medical records typically integrate with Pharmacy Information Management Systems by:
  • Creating and storing medication order (script) details and current medications in the electronic medical record then sending them via HL7 to the Pharmacy Information Management System;
- Storing dispensed medication details in the electronic medical record sent via HL7 from the Pharmacy Information Management System; and storing drug administration details then sending them via HL7 to the Pharmacy Information Management System. Dispensed medications generated from the Pharmacy Information Management System may be initially stored in an intermediate EMR and then sent to an EMR as part of an HR extract such the current medication list in a discharge summary.

**PKI (Public Key Infrastructure):** A system that uses electronic certificates and various authorities (servers that validate certificates, registrations, etc.) to authenticate each entity in an online transaction.

**Portal:** A Web site that offers a range of resources, such as e-mail, chat boards, search engines, content, and online shopping.

**Practice Management System (PMR):** That portion of the medical office record which contains financial, demographic, and non-medical information about patients.

**RHIO (A Regional Health Information Organization):** Is a multi-stakeholder organization that enables the exchange and use of health information, in a secure manner, for the purpose of promoting the improvement of health quality, safety and efficiency. Officials from the U.S. Department of Health and Human Services (HHS) see RHIOs as the building blocks for the National Health Information Network (NHIN). When complete the NHIN will provide universal access to electronic health records.

**Radiology Information System:** Electronic medical records are repositories of patient data either entered directly or interfaced from external applications. One such application is a Radiology Information System (RIS) that is typically used by hospital radiology departments to record activity in the department. Typical modules include:

- Radiology request registration;
- Appointment scheduling;
- Exam management;
- Exam reporting;
- PACS integration; and
- Management reporting.

Electronic medical records typically integrate with Radiology Information Systems by creating and storing radiology request details in the Electronic Health Record then sending them via HL7 to the Radiology Information System; storing radiology request details in the Electronic Health Record sent via HL7 from the Radiology Information System; storing radiology exam results in the Electronic Health Record sent via HL7 from the Radiology Information System; and

- Storing radiology exam image information in the Electronic Health Record sent via DICOM from the PACS. Radiology investigations generated from the RIS may be initially stored in an intermediate EMR and then sent to an EMR as part of an EMR extract such as a discharge summary.
**RHIO (Regional Health Information Organization):** A health information organization that brings together health care stakeholders within a defined geographic area and governs health information exchange among them for the purpose of improving health and care in that community.

**Relational Database:** A database in which all information is arranged in tables containing predefined fields. Changing a field in one record automatically changes the same field in all related records, allowing for easy global database management. Using SQL, reports and comparisons can be generated by selecting fields of interest from the original database.

**RFID (Radio Frequency Identification):** Technology that uses tiny chips and antennas to track products and store product information.

**Scalability:** The ability to add users and increase the capabilities of an application without having to making significant changes to the application software or the system on which it runs.

**SDO (Standards Development Organization):** An organization that develops standards to provide stability and consistency for a product or service in hopes of lowering costs and maintaining or improving quality.

**Server:** A networked computer that manages a specific set of network resources. A server may manage network traffic or peripheral use, store files, or run applications for users at other computers on the network.

**Service Level Agreement:** A contract between a service provider and a user that specifies the level of service expected during a contract term. Service level agreements determine how performance will be measured and, in the event of underperformance, how the penalties will be calculated and paid.

**Smart Card:** An electronic device about the size of a credit card that contains electronic memory and, increasingly, an embedded microchip. The cards are used to store data; in a health care context, this is often personal health information. The data can be accessed using a smart card reader: a device into which the card is inserted. Smart cards are not the same as magnetic strip cards, such as most credit cards; smart cards typically can store more information.

**Sniffer:** A program that monitors and analyzes the flow of information on a network, searching for bottlenecks and problems. Network managers use sniffer programs to monitor traffic flow and keep data moving efficiently. A sniffer can also be used legitimately or illegitimately to capture data transmitted over a network.

**SQL (Structured Query Language):** A standard command language used to interact with a database.

**Standards:** Though there are few standards for modern day EMR systems as a whole, there are many standards relating to specific aspects of EMRs. These include: The European Committee for Standardization, founded in 1961 by the national standard bodies in the European Economic Community. It develops technical standards for many different business domains, including health care; DICOM (Digital Imaging and COmmunication in Medicine).
Imaging and Communications in Medicine) - a heavily used standard for representing and communicating radiology images and reporting; HL7 -- Health Level 7 – An ANSI standard for healthcare specific data exchange between computer applications. HL7 messages are used for interchange between hospital and physician record systems and between EMR systems and practice management systems; HL7 Clinical Document Architecture (CDA) documents are used to communicate documents such as physician notes and other material; ISO TC215 -- The International Organization for Standardization (ISO) is an international standard-setting body composed of representatives from national standards bodies. Founded on February 23, 1947, the organization produces world-wide industrial and commercial standards, including standardization in the field of health information and Health Information and Communications Technology (HICT) to achieve compatibility and interoperability between independent systems. Also, to ensure compatibility of data for comparative statistical purposes (e.g. classifications), and to reduce duplication of effort and redundancies. ISO is not an acronym; it comes from the Greek word ‘isos’, meaning "equal"; OpenEMR - public specifications and implementations for EMR systems and communication, based on a complete separation of software and clinical models; OpenEMR Foundation -- a not-for-profit foundation supporting the open research, development, and implementation of EMRs. Its specifications are based on a combination of 15 years of research into EMRs and new paradigms designed to be the basis of a medico-legally sound, distributed, versioned EMR infrastructure. OpenEMR also develops and publishes EMR specifications and open source EMR implementations, which are currently being used in Australia and parts of Europe; HIMSS -- Healthcare Information and Management Systems Society -- is the healthcare industry's membership organization exclusively focused on providing leadership for the optimal use of healthcare information technology and management systems for the betterment of human health. Founded as a non-profit in 1961 with offices in Chicago, Washington D.C., and other locations across the country, HIMSS represents approximately 17,000 individual members and some 275 member corporations that employ more than 1 million people. HIMSS frames and leads healthcare public policy and industry practices through its advocacy, educational and professional development initiatives designed to promote information and management systems' contributions to ensuring quality patient care; and XML -- Extensible Markup Language is a general-purpose markup language for creating special-purpose markup languages, capable of describing many different kinds of data. Its primary purpose is to facilitate the sharing of data across different systems, particularly systems connected via the Internet. Languages based on XML (for example, Geography Markup Language (GML), Physical Markup Language (PML) are defined in a formal way, allowing programs to modify and validate documents in these languages without prior knowledge of their form.

**Subscription-Based Model:** A business model based on a monthly fee charged for the use of equipment, software, services or content, or some combination of those. Used by many vendors, such as providers of e-prescribing systems. See also transaction-based model.

**Supply Chain Management:** Coordinating the movement of goods, from the initial customer order to final delivery of products. This includes management of raw materials, supply, production and distribution, taking into account quality, cost, customer satisfaction, and production speed. The Internet is frequently touted as a tool for improving the efficiency of supply chain management.
**T1, T3, and T4:** Types of transmission lines in the T-carrier telecommunications system that are often used to provide Internet access to larger organizations. T1 lines can transmit about 1.5 Mbps of data. A T3 line contains 28 T1 lines together and can transmit about 45 times the data of a single T1, enough for full-motion video. Six T3 lines make one T4 line, capable of transmitting about 274 Mbps.

**Tablet Computer:** This is a flat-panel laptop that uses a stylus pen or touch-screen, rather than a keyboard, for entry of data and commands.

**TeleHealth:** The use of telecommunications and information technology to deliver health services and transmit health information over distance. It is sometimes called telemedicine.

**TeleMedicine:** The use of telecommunications and information technology to deliver health services and transmit health information over distance. It is sometimes called telehealth.

**TeleRadiology:** A form of telemedicine that involves electronic transmission of radiographic patient images and consultative text.

**Thin Client:** In a client/server system, a client with little processing or data storage capability that primarily relies on a central server to perform those functions.

**Total Cost of Ownership:** A long-term view of all costs associated with a specific technology investment. Costs include that of acquiring, installing, using, maintaining, changing, and disposing of a technology during its useful life.

**Transaction-Based Model:** A business model based on service fees charged for each transaction conducted using the vendor’s equipment, software, services or network. Used by some e-health vendors, including providers of e-prescribing systems. See also subscription-based model.

**UI (User Interface):** The part of an application that allows the user to access the application and manipulate its functionality. It can include menus, forms, command buttons, etc.

**URAC (American Accreditation HealthCare Commission):** A not-for-profit organization that performs quality accreditation for the managed care industry. URAC also launched a Web site accreditation program in 2001 to establish quality standards for health sites on the Internet, and an Information Technology Advisory Committee to address other quality issues related to health care information technology.

**URL (Uniform Resource Locator):** A Web address. Each Web page has a unique URL.

**VPN (Virtual Private Network):** A network that uses public connections, such as the Internet, to link users but relies on encryption and other security measures to ensure that only authorized users can access the network.

**WAN (Wide Area Network):** A computer network that covers a large physical area. A WAN usually consists of multiple local area networks (LANs).
WAP (Wireless Application Protocol): A proposed standard for delivering content to mobile wireless devices such as cellular phones and handhelds.

Web Master: The person responsible for operating/maintaining a particular Web site or Web page.

Web Server: This is a network computer which stores and transmits documents and other data to Web browsers via HTTP.

Web Site: A group of related files, including text, graphics, and hypertext links, on the World Wide Web. Accessed by typing its URL, a site usually includes layers of supporting pages as well as a home page.

Web-Enabled: Refers to software applications that can be used directly through the Web. Web-enabled applications are often used to collect information from, or make functionality available to, geographically dispersed users (e.g. disease surveillance systems).

WEP (Wired Equivalent Privacy): A security protocol for wireless local area networks (WLANs) using the 802.11b standard.

Wi-Fi: Another name for 802.11b, a wireless networking standard ratified by the IEEE in late 1999 and supported by the largest wireless local area network (WLAN) vendors. Wi-Fi is short for wireless fidelity.

Wireless Internet: Wireless mobile computing that uses the Internet as part of the underlying communication infrastructure. Sometimes called wireless Web.

Wireless LAN Adapter: Component attached to or integrated into a handheld device that transmits data wirelessly between the device and a local area network (LAN) access point.

WLAN (Wireless Local Area Network): A LAN that uses radio frequency technology to transmit data over relatively short distances. It can replace or extend a wired LAN.

WML (Wireless Markup Language): Web development language that allows Web sites to format content to fit the small screens and limited storage and processing capabilities of mobile devices.

World Wide Web: An international group of databases within the Internet containing billions of documents that are formatted in HTML and link to other documents and files. Although the terms Internet and Web are often used interchangeably, they are not synonymous. See also Internet.
RESOURCES UTILIZED IN IA/NEPCA AND INCONCERTCARE

HIT IMPLEMENTATION MANUAL

Internet Site Resources

http://www.ahima.org/e-him/prac_guidelines.asp


http://www.centerforhit.org/online/chit/home/about.html


http://www.cchit.org/

http://www.hrsha.gov/healthit/

http://healthit.ahrq.gov/portal/server.pt?open=512&objID=1077&cached=true&mode=2&userID=7330

http://blogs.biproinc.com/healthcare/?p=15

https://erroom.hrsa.gov/eRoomASP/DlgChooseClient.asp


SolutionMatrix.com


http://healthit.ahrq.gov/portal/server.pt/gateway/PTARGS_0_3882_813098_0_0_18/Glossary%20of%20Health%20IT%20Terms%20-%20West%20Virginia%20State%20Medical%20Association.pdf