INTRODUCTION

The Primary Care Information Project (PCIP) is a community EHR extension project founded by the New York City Department of Health and Mental Hygiene (NYC DOHMH). Since July 2007, the PCIP has implemented a commercially available EHR, eClinicalWorks (eCW), at more than 460 practices and with 2,200 providers in private physician offices, health centers, and hospital out-patient departments (OPDs).

Small practices typically include between one and five providers’ offices, whereas large practices can vary between five and a few hundred providers spread over numerous sites and can include many medical specialties. Even though the practices we work with are typically already using some kind of practice management system, they require significant assistance preparing and transforming their practice to a fully integrated EHR. Our implementation success rate is over 99 percent, with less than 1 percent of our providers reverting back to paper.

Some of the reasons for this success are:

- PCIP’s role as a neutral third party that can advocate for the practice and EHR vendor as needed
- Hands-on support provided by our team of PCIP Project Managers (called Implementation Specialists) who work closely with the vendor and practice project managers (PMs)
- A close monitoring of the implementation process and slippage using high-level project milestones
- Weekly status meetings with the eCW PMs to touch base on practices and problem-solve through any challenges, the eCW support account managers to escalate practice issues, and the two executive teams to discuss high-level strategy
- Enterprise-wide solutions to systemic challenges, such as creating a separate project management pathway for tracking reference lab implementations
• A prerequisite set of utilization and quality measures that demonstrate a practice’s comprehensive use of their EHR
• Leveraging the ability of the DOHMH to connect practices to hardware subsidy programs and bulk discounts, making EHR implementation affordable to providers serving the medically underserved patients in New York City

This chapter will describe how best-practice project management concepts can be applied to EHR implementation. The key players in this process are the PMs from the physician practice, the EHR vendor, and PCIP. The usual mechanism of engagement is one in which a practice contracts with the EHR vendor and relies on them for implementation and post go-live support. In this case, PCIP was funded to not only subsidize the cost of the EHR, but also to provide additional project management and wrap-around support to practices who serve medically underserved patients in New York City. This is the model being used by Regional Extension Centers to help support and serve healthcare providers to become adept and meaningful users of EHRs.

One definition of Project Management is “the discipline of planning, organizing, and managing resources to bring about the successful completion of specific project goals and objectives.” In addition, it seeks to apply the “techniques and systems to the execution of a project from start to finish to achieve predetermined objectives of scope, quality, time and cost,” which are the critical constraints of any project. Project Managers can obtain Project Management Professional certification from the Project Management Institute (PMI) and join a network of over 300,000 professionals in the field. This certification provides a strong foundation in the principles of project management methodology and enhances a PMs marketability.

**PROJECT STAFF ROLES**

**Sponsor**
The Project Sponsor is the “senior executive responsible for the project. The sponsor has authority over both the project team and the customer and makes sure that all the resources necessary to succeed are available to the team. The sponsor kicks off the project at the initial meeting, promotes the project at the highest level of the organization, receives regular status reports, and intervenes when necessary to remove roadblocks for the project team.” The Sponsor is also responsible for selecting the PM and signing off on the Project Charter.

The Project Sponsors for PCIP were Commissioner Thomas R. Frieden, MD, MPH, and Assistant Commissioner Farzad Mostashari, MD, MSPH, both of whom provided significant oversight of the project. Dr. Mostashari met with various PCIP project teams on a daily basis, and Dr. Frieden met with PCIP’s Executive team twice a month. For small practices, the Sponsor will predominantly be the lead physician—and in health centers and hospital OPDs, the CEO, CMO, or CIO. Some projects have suffered greatly due to inadequate support from the Sponsor who was faced with competing priorities and let the EHR implementation take a backseat to others. There is a dramatic difference in implementations that have strong sponsor support and presence, especially as the team faces challenges along the way. It is the role of the PM to ensure that Sponsors receive adequate feedback at the appropriate frequency and in sufficient detail, so they can provide optimal assistance in clearing any obstacles. Providing too little detail
might obscure important points, whereas giving too much detail might waste time and energy.

The role of the Sponsor is absolutely essential in the rollout of a large multi-site implementation. The Sponsor can help facilitate the rollout discussions with the site-level leaders to determine the best sequence and speed for the project. Sometimes external determinants, such as the need to spend down allocated resources within a fiscal year, can determine the parameters of a project, but site-specific needs must also be taken into account to allow for the best possible results.

In the Planning phase, the Project Team must work closely with the Sponsor to take into account various factors such as:

- The presence of key opinion leaders among the early adopters who can weather the initial hurdles experienced by going first. These early adopters must also serve as super users for those that follow.
- The effect of other internal or external competing priorities, such as upcoming construction, annual reporting deadlines for health centers, the start of the school year for pediatricians, planned vacations, etc.
- The hardware preparedness of a site—the better equipped and more tech-savvy, the easier their implementation.
- The computer skills of all staff including those at the front desk, billing department, clinical support staff and providers.
- The number of external interfaces required, such as with reference labs, diagnostic imaging and billing companies.
- The number of PM staff available to assist each practice adequately through all phases of the project, including preparing for the implementation, execution and post go-live support.
- The number of staff at the site, as well as the mix of full-time and part-time staff, residents, specialists, etc.

Once the decision about the rollout schedule has been determined, it is the role of the Sponsor to help launch the project, build buy-in, and provide ongoing support and momentum to the team. The Sponsor will need to engage the necessary leaders to ensure that the sites are on board with the project and the PM team does not experience push back from sites that seek to slow down or resist their implementation. The PM team must engage the Sponsor as soon as there is project slippage, as this is a shared responsibility. This allows the PM to focus on the rollout without engaging in combative discussions with resistors. There should also be periodic celebrations that recognize the achievement of interim or significant milestones. Large institutions can undergo projects that last over several years, so it is critical to support and celebrate the successes of the team along the way.

**Project Manager**

Some of the key skills necessary for a PM include the following: communication, organization and planning, budgeting, conflict management, negotiation and influencing, leadership, and team building and motivating. PMs need to have sufficient depth and breadth of knowledge in order to be effective. They need to understand the needs of the project in sufficient detail and be able to keep track of all its moving parts. In health
IT projects, “Project managers are expected to possess more of an understanding of technology than a command of technology.” In addition to having the training and background in the principles and tools necessary to manage this process, PMs must possess the intangible drive and “can-do” attitude that provides them with the fortitude to overcome obstacles and continuously be a few steps ahead of the rest of the team. The PM is ultimately accountable for the success and quality of the project and must mobilize all necessary resources to accomplish their tasks.

In the case of the PCIP, this role is shared between all three, but ultimately the PMs from PCIP and the vendor have the shared goal of bringing approximately 100 providers live per month. This allows the PMs the flexibility to modify individual project plans for struggling practices while keeping the overall project goals on track.

**Project Team**

As shown in Table 11-1, a project team is “comprised of the project manager, project management team, and other team members who carry out the work but who are not necessarily involved with the management of the project. The team is comprised of individuals from different groups with knowledge of a specific subject matter or with a specific skill set who carry out the work of the project.”

The PCIP PM (or Implementation Specialist) serves as the main point of contact during the project implementation. Additional teams are mobilized based on the stage of implementation and size of the practice. As seen in Table 11-1, in a small practice, the Provider or Office Manager can play multiple roles (including that of a PM), which may be outside of his or her typical field of expertise. This can cause significant delays

<table>
<thead>
<tr>
<th>Task</th>
<th>EHR Vendor</th>
<th>Small Practices</th>
<th>Large Practices</th>
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<tbody>
<tr>
<td>Implementation Project Management [Implementation Specialist]</td>
<td>Project Manager, Support Manager, Trainer</td>
<td>Project Manager, Provider, Office Manager</td>
<td>Project Management Team</td>
</tr>
<tr>
<td>Infrastructure [IT Coordinator]</td>
<td>Technical Specialist</td>
<td>IT Consultant</td>
<td>IT Department</td>
</tr>
<tr>
<td>Interfaces: labs, billing, immunization registry, diagnostic imaging [Systems Integration team]</td>
<td>Interface team, External vendors (reference labs, billing company, Health Department, DI companies)</td>
<td>Providers, Office Managers</td>
<td>IT Department, Hospital or in-house lab</td>
</tr>
<tr>
<td>Billing [Billing Specialist]</td>
<td>Billing Specialist</td>
<td>Provider, Office Manager, Biller</td>
<td>Financial Department</td>
</tr>
<tr>
<td>Privacy and Security [Privacy and Security Consultant]</td>
<td>Trainer</td>
<td>Provider, Office Manager, IT Consultant</td>
<td>IT Department, Legal Counsel</td>
</tr>
<tr>
<td>Quality Assurance [Development team]</td>
<td>Trainer</td>
<td>Provider, Office Manager</td>
<td>Site Administrators, QI Unit</td>
</tr>
<tr>
<td>Quality Improvement [Super User, Quality Improvement Specialist]</td>
<td>Data Reporting team</td>
<td>Provider, Office Manager, Panel Manager</td>
<td>Quality Improvement Unit, Data Analysis Department</td>
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in the time line and in the speed at which the project gets implemented. Some practices function at such a small profit margin that the provider will allocate time during the day to see some walk-in patients rather than complete necessary project tasks, such as filling in clearinghouse information necessary to start their practice enrollment. In this scenario the provider is performing the function of a Provider, Project Manager, and biller. In the long run, providers may need to find a part-time biller who can dedicate time and energy to the billing setup and testing rather than trying to do it all themselves.

One solution that was used by a few collaborating neighborhood practices was to share a PM who was just dedicated to their EHR implementations, thereby allowing the providers to see patients with minimal interruptions. The PM spent 1–2 days per week at each practice, facilitating quicker dissemination of new learning between the practices, sharing resources, enabling greater flexibility in training schedules, sharing templates between specialists, and negotiating a bulk discount for hardware.

The PMs should ensure that they learn the privacy and security settings of the EHR to protect the patients and practice. They should work with the trainers, IT or legal departments to sign off on the default settings that force password resets, time out for sessions, and set up role-based access. Practices must also ensure that Quality Assurance measures that existed on paper are adapted to the EHR and that Site Administrators configure the system appropriately so that they are able to run their QA and QI reports once the project is complete and the data are captured in the EHR.

Table 11-1 also shows the range of tasks that need to occur, sometimes concurrently during the months of implementation. For example, a PM will need to engage the Interface team at the start of the process to ensure that all interfaces are set up at the time of go-live. Inadequate interface testing can cause some of the most significant delays in the implementation time line, and its importance can never be underestimated. Therefore, engaging the right team members at the right time and with the correct frequency is a crucial part of the process.

Larger practices have different teams that handle the different tasks of Project Management, external interfaces, billing, and IT support, so they are able to dedicate a significantly large amount of resources to the overall project. Ideally, having strong teams dedicated to various aspects of the project should lead to a more coordinated and smoother implementation process, but often challenges inherent to every organization rise to the surface. The PM has the formidable task of coordinating conflicting schedules, juggling multiple team priorities, addressing organizational politics, and addressing entrenched resistance to change. The process of EHR adoption can often exacerbate any pre-existing issues that exist at a practice and must be dealt with deftly. A skilled PM can help facilitate such resolution with the help of the Sponsor.

The interplay of multiple teams in a large practice, if managed well, can work to create a matrix organization that can be a powerful vehicle for change. One large health center in PCIP created such a structure for their EHR rollout, and it remains a focal point from which new initiatives are launched. The project team has proven itself to be well respected, talented, empowered, resourceful and visionary. They have demonstrated project success and have the full support of their senior leadership.
Customers
In the context of an EHR Implementation, the customers can be the providers, ancillary practice staff, patients, families, caregivers and health plans. Patients are important stakeholders in this process, as they are dramatically affected by the short-term upheaval the practice is undergoing during this significant project and are often provided no roadmap for what to expect. Practices forget to communicate to the patients how they are the ultimate beneficiaries of this practice transformation. The end point of the project may be limited to the practice going live on the EHR, but the goal for the providers to start using the EHR as a tool to improve the quality of care they provide through the use of clinical decision support, point of care alerts, population management, medication reconciliation tools, and the other features of the EHR. However, the immediate experience of the patient is not an understanding of how they will ultimately receive better preventive care, but rather one of longer wait times, less quality time with the provider and a repetition of their medical history that is no longer accessible to the provider. This is a very real concern of both provider and patient and must be addressed.

A key role of the PM is to help the provider engage patients in this transformative process from the start. Putting up signs in the waiting room that have an upbeat description of the stages of the project and its current status will go a long way in empowering the patients. Showing patients what they stand to gain through this process is also critical in having them be active participants in their healthcare. Encouraging them to sign up for the patient portal at an early stage can yield some early benefits, such as getting them immediate access to their lab results. The PCIP also made use of our Department of Health's public health detailing campaigns (modeled after the pharmaceutical model) to deliver brief health messages and materials that focus on key clinical areas. The PCIP campaign encouraged providers to adopt an EHR and also marketed the benefits to the patients. These materials were distributed to the entire care team at a practice and attractively displayed in waiting rooms for patients to read. When the full care team is engaged, members see their own role in the newly enhanced workflows. For example, instead of just having the patient sign a check-in sheet and sit in the waiting room, the front desk staff can now educate the patient about the patient portal, obtain their consent and e-mail address, and queue them up for a conversation with the provider.

Stakeholders
Stakeholders can be internal (such as board members, the legal department, site administrators, medical directors and providers) or external (such as patients; federal, state, or local government funders; Public Health reporting agencies; quality improvement organizations; and banks). Engaging and communicating with all stakeholders is a key aspect of the PM’s task, especially as organizations stand to lose considerable funding if they fall behind in their loan repayment plan or have a disruption in their mandatory reporting requirements. Obtaining funding for the purchase of hardware has been increasingly challenging for practices, such that PMs must adjust their schedules to accommodate a bank’s requirement of matching the release of funds with proof of work completed. Similarly, all Federally Qualified Health Centers (FQHCs) have a Quarter 1
deadline for completing their Uniform Data System (UDS) data such that all available resources will be mobilized to help compile these reports. The PMs must plan for and adjust their expectations during the first quarter of the year to accommodate this critical stakeholder.

A key stakeholder and partner for PCIP has been the Medical Independent Practice Associations (IPAs) that have negotiated rates with EHR vendors, provided support to members implementing an EHR, built a network of shared resources, facilitated group training and other activities critical to adoption. Their role in mobilizing their affiliated community providers (often affiliated based on geography, ethnicity or hospital affiliation) has been extremely beneficial.

**Vendors**
Prior to the start of the project, the Sponsor must engage and line up contracts with multiple vendors or subcontractors to ensure that services and deliverable deadlines are coordinated and met. Some of the critical contracts are with the EHR vendor, reference laboratories, radiology and diagnostic imaging centers, pharmacies, the E-prescribing company, IT consultants, Internet providers, hardware retailers, clearinghouses, and billers. The role of the PM is to ensure that all necessary contracts are in place and monitored over the course of the project. Holding all vendors accountable and coordinated is essential, especially as delays with one may significantly affect other interdependent entities.

**PROJECT LIFECYCLE**
There are typically five phases to a project’s lifecycle: concept, definition, planning, execution and closeout. The Concept or Initiation phase involves conducting a review of the market and an articulation of the problem. The Definition phase involves developing a mission and vision for the project and outlining what is included and excluded from the scope. Spending sufficient time in the Definition phase is essential, as it determines the ensuing success of the project. Planning is an absolutely critical phase, as poorly planned projects have a greater likelihood of failure. This is the time to think through all the possible challenges and impediments, as it is considerably cheaper to solve them in this early phase than during execution. Planning the implementation pathway and all possible risk management strategies is also important so that they seamlessly lead into the execution phase. This phase also includes control because mid-course corrections must be reflected in the revised plan, which then serves as the new roadmap.

Finally, closing an EHR Implementation Project can be challenging, as the scope of the project can continue to expand due to technological advances and changes in the industry. For example, there can be significant “add-ons” that were not part of the original scope or not developed at the time of implementation, such as the patient portal, connectivity to an HIE and bi-directional lab or immunization registry. Therefore, a project can be coming to a close but may need to be expanded if a significant set of additions needs to be implemented. This can also be addressed by creating multi-phase projects with staggered time lines.
In addition, a project may need to be halted due to unforeseen or unavoidable conditions, at which point all concerns and accomplishments must be documented with the appropriate level of detail. There have been cases in which practices halt their implementation midway through due to budgetary concerns or a change in leadership. Having appropriate archival documentation will help the next team pick up where the first one left off.

**PROJECT MANAGEMENT TOOLS**

Numerous tools can be used for tracking during the cycle of the project. Those which end up being used are typically dictated by the budgetary restrictions or by the level of sophistication of the project staff. IT consultants and EHR vendors typically use Visio or MS Project to create floorplan recommendations and project plans. They serve not only as implementation documents but also as reference guides for their policy and procedure manuals. Providers can also be given access to the vendor’s project management and support portals so they can stay current with the latest project plans, add in key provider- and practice-level information, make requests for additional training dates, schedule times for software installation, and other project tasks. When all else fails, making detailed plans using Excel can be just as effective and easy to use.

**PROJECT MANAGEMENT KNOWLEDGE AREAS**

According to the Project Management Book of Knowledge (PMBOK), there are nine knowledge areas that a Project Manager must master:

- **Project Integration Management**
The activities of Integration Management include creating the project charter, scope, project plan, project management plan, managing the execution of the project, monitoring and controlling the work, performing integrated change control, and closing out the project or phase. A creative PM will use different strategies to get to the end result and ensure that all components are coordinated.

- **Project Scope Management**
Defining and controlling what is within or external to the scope of the project is critical along with its associated work breakdown structure. A common example for large multi-site practices is that they add new practice sites over a period of years and face a significant challenge of integrating and supporting a variety of legacy practice management systems. This makes the task of data integration and migration challenging, and it requires developing detailed scope documents with each of their existing vendors. Managing the scope and sequence of these interfaces is critical, especially as it relates to time and cost management of the project. Therefore, an IT team should spend a significant amount of time conducting assessments with each site and involving employees at all levels in this discussion. The risk of forgetting a key part of the data chain is that something essential will be left out, leading to cumbersome and inefficient workarounds.

   Decisions about the scope of a project sometimes need to be modified along the way. For example, a practice that was staffed mostly by primary care providers had a small ophthalmology practice that was not part of the original scope for implemen-
tation. At some point during implementation, the EHR vendor developed a vision module that was available for immediate deployment, and the practice had to make a decision if it was worth adjusting the scope to add in the ophthalmologists or leave it until a later date. The practice considered the cost of gathering the necessary team members and resources in the future and decided to approve the change request even though it lengthened their implementation slightly. Therefore, they were able to fully implement the entire practice at one time and added to their quality goals of improving care coordination between their primary care providers, podiatrists, and ophthalmologists treating patients with diabetes.

**Project Time Management**

Large hospital outpatient practices are especially dependent on external vendors to set up interfaces with their hospital scheduling and billing systems. This task of coordinating between the various teams is formidable and is the foremost cause of implementation delays in large practices. Slippage in this area has significant impact on keeping the project on schedule. It is useful to assume that there will be delays and build in sufficient float to ensure that there are dedicated resources set aside to work solely on interfaces.

A common challenge for small practices is that they have fewer backup staff members, such that when one leaves for month-long vacation, his/her tasks must be distributed to others, thereby causing disruption to time lines. While vacation schedules can be adjusted slightly, there are some hard deadlines to which providers, such as pediatricians, must adhere, so any implementation that overlaps with a September deadline is sure to be delayed. Setting up realistic expectations and commitment required from the entire team is important at the start of the project so that staff can adjust vacation schedules and work hours as needed.

The PCIP PMs use a customer relationship management tool to track the overall project time lines, time allocation, and slippage. Keeping individual projects as close to schedule as possible allows for the best allocation of resources and maintains our capacity to continuously assist new practices.

**Project Cost Management**

Unrealistic and unplanned costs are one of the top causes of project failures. It is important to plan budgets thoroughly so that all parties have an accurate estimate of their ability to carry out the project according to the scope, time and budget. Providing updated budgets and interim analyses, including reviewing planned versus actual costs, can also dramatically increase success.

At PCIP, the Outreach team and Infrastructure Coordinator conduct a cost analysis for practices at the start, so they have an estimate of the cost of purchasing new hardware for their office. In addition, they must be prepared for a loss of productivity during their training phase, as well as decreased revenue after they go live. Not only must PMs budget for these known costs, they must also keep vigilant track of unexpected costs and plan for some reserves to address any IT emergencies that may necessitate some consultant time.
Health centers that typically serve as safety-net providers experience significant budgetary and personnel challenges. Some have had turnover of key staff and have had to place their projects on hold until they hired new CMOs or CIOs. As a result, they wasted significant resources and were in danger of falling behind on their deliverables for their stakeholders, especially for their funders. The cost of maintaining the salaries of a full Project team given these setbacks can be very expensive. A PM may need to shift his or her attention to other duties in the practice until the project is back on track. The danger of this delay is not just additional costs but a decreased sense of urgency to advance the project. This can lead to a loss of focus which is hard to undo when the project resumes.

**Project Quality Management**
Performing thorough quality assurance and control checks is essential to maintaining a standard for the project. In EHR implementation, this can be achieved by developing and disseminating best practice guides and checklists that have demonstrated success. Large practices often capitalize on this transition as an opportunity to standardize the methodology used between sites and create institutional quality management plans. The process of EHR implementation is often a golden opportunity for a practice to redesign its inefficient processes, and the PM can help facilitate these discussions.

Quality management applies not just to the steps of hardware and software deployment, but also to the migration of medical data into the EHR. Providers are faced with the burdensome task of accurately transferring key patient information, such as problem lists, medication history, and allergies from thick medical charts into structured data fields in the EHR. As providers switch from paper to an EHR, they are afraid of losing tried-and-tested methods of conducting their own quality checks. PMs must make sure that quality processes are recreated in the EHR so that critical patient events are given priority. For example, providers typically want abnormal results scanned in so that they can conduct the appropriate level of follow-up based on the severity of the diagnosis. Each practice must make a strategic decision about the length of time it will devote to preloading historical data and ensuring it follows extensive quality assurance procedures. After the initial practice management data migration is complete and basic patient demographic data has been imported, the PM must work with the internal practice resources to create a systematic process for reviewing, flagging and entering key data elements based upon a set of predetermined criteria. It is important to involve the Quality Assurance team so that data checks are performed with regular frequency until a certain quality of work is observed and maintained.

**Project Human Resource Management**
The Project Sponsor and PM must make decisions about how many team members will be selected from within or from the outside the organization. If considering team members from within, they should determine if they currently possess the necessary skills or if they need additional training in advance of the project’s start. External hires may not know the key players, and therefore it may be harder to garner support or work through the politics associated with the organization. On the other hand they may provide objective guidance that can cut across unproductive political divisions.
Teams should be augmented as needed with subject matter experts. The role of these experts can be temporary and time-limited. PMs should not be afraid to pull in additional help, as it will prove to be cost-effective in the long run; failure to incorporate some key input may result in costly delays later on. Finally, periodic assessments of team performance should be conducted along the way to make sure staff is performing up to standards. Underperforming members should be replaced if remediation efforts fail. Efforts should also be made to find a good fit for staff members, and attention should be given to group dynamics to ensure the group is functioning optimally and there is cooperation and communication between members.

The initial structure of the PCIP team did not include any super users, but we soon realized that our providers were struggling with templates and system customization soon after they went live. Pediatricians who used to capture immunization history within a matter of minutes were spending an inordinate amount of time documenting during their visits. We responded to this unexpected and urgent need by hiring a group of technically-skilled super users to provide on-site assistance to tailor the EHR to the provider. By the time the super user arrives at the practice, the provider is versed on the basic functionality of the EHR and is ready for training on its advanced features.

**Project Communications Management**

The goals and mission of the project should be clearly communicated from the start and maintained throughout the project. Insufficient information leads to a feeling of disempowerment and can be a setback for the project. PMs should continuously communicate the progress of the project, changes in timelines and challenges experienced to the appropriate stakeholders and project staff. They should also keep an open process for communication so that all project staff feels comfortable sharing their concerns.

Providing interim progress data back to all stakeholders is critical for building buy-in and significantly affects adoption when people feel they have an impact on the project. The success of the EHR project will be significantly affected by the empowerment of the care team, and failure to engage these key stakeholders can be disastrous. One practice did not communicate the project implementation phase to their end users and, as a result, were not prepared for their final training and go-live. They lost credibility with their staff and later had to spend unnecessary resources to pay for additional training days.

The PCIP relies on open and frequent communication between all members of its project team. The weekly meetings with the vendor teams help to build strong partnerships between different staff members so that we can all provide coordinated assistance and communication to our practices.

**Project Risk Management**

PMs should conduct periodic qualitative risk assessments to gauge the perceived and actual risks by stakeholders. A process should be established for identifying, addressing, and communicating responses to the survey. The “first step in risk planning is risk assessment, which is a matter of turning uncertainty into risk.”

Through this process, we are able to identify and prepare for potential future challenges.
For example, losing a PM midway through a project is a significant risk for each medical practice. The PM in most small practices is typically not a full-time person and is expected to maintain his or her existing workload in addition to managing the extensive task of the EHR implementation. This has led to staff burnout and turnover, causing a significant setback to the team. Since budgets are tight and finding another full FTE is improbable, practices can assist PMs by spreading some of the sub-tasks among other staff. This creates a layer of redundancy and the project learning is shared. It is also critical to have clear and meticulous documentation of the project management process and progress at all times so that should there be turnover a new PM can pick up where the last one left off.

A significant risk for EHR implementations is that a bi-directional lab interface is often not completed by the time the practice goes live so that orders and results are not entered electronically. The practice PM must work actively with the lab company and EHR vendor to ensure that contracts are signed at the start of the project and that the lab tasks are built into the work breakdown structure (WBS)\(^\text{15}\) in sufficient detail. There is a risk this may still not occur, and workarounds need to be in place should the practice need to go live on paper. Thinking through the two sets of workflows for paper and an electronic interface are essential so that the end user has clear instructions of the contingency plan. The benefit of being part of a large-scale implementation such as PCIP is that some of these predictable risks have been mitigated, and the best practices can be disseminated.

Project Procurement Management

Procurement issues can derail a project’s scope, time, and budget and can be avoided with careful planning of purchases, especially of hardware. A PM must ensure all contracts are in place at the start of the project and identify a set of resources that can help expedite approvals and procurement if needed in an emergency.

CASE STUDY OF A SMALL PRIVATE PRACTICE

The case study is of a solo provider practice in Staten Island (New York) that started its implementation in 2004 and went live in four months. The practice has been live on a fully integrated EHR for the past six years and serves predominantly working class families, civil servants and small business owners, many of whom are on Medicare or are uninsured. This is an example of a small scale implementation and is a realistic model for the majority of practices at PCIP.

The project team consisted of:

- A full-time physician who is board certified in Internal Medicine, Pediatrics and Geriatrics. The physician was the Sponsor of the project as well as the part-time PM. The responsibilities of Project Management were shared between him and the Office Manager. This practice implemented their EHR using many part-time staff and performed Project Management on a budget.
- An Office Manager (OM) who functioned as the part-time Project Manager during implementation, as well as a Medical Assistant (MA) and front desk receptionist. Her key role was to coordinate all activities within the office and with external vendors. She was the main point of contact with external groups.
such as IT consultants, EHR vendor, lab companies, hardware vendor, etc. She mapped out the current state workflows for the practice and worked with the provider and staff to modify the future state workflows. She also created policies and procedures and made sure they were being followed and adapted as necessary. She became an adept EHR user and proficient with IT issues, such that over time she provided the first-line IT support for simple issues such as password resets, rebooting the server, etc. She served as a liaison between the staff and provider, communicating next steps in the project timeline and bringing back concerns to the provider. Her role facilitated dialogue between staff members and addressed issues so they did not escalate.

In addition, staff included:

- A full-time Medical Assistant (MA) who divided her time between prepping the patients for the provider and tending to the front desk.
- A half-time biller who had to learn billing for an EHR.
- A part-time assistant who helped with basic clerical work, made appointments, coordinated referrals, and handled the phones.
- A part-time IT consultant whose primary role was coordinating between the hardware and software vendors during implementation and was used on an ad-hoc basis during the rest of the year. The OM functioned as the first line of support, and the physician served as the second line of support so the IT consultant costs were kept to a minimum. He was brought in approximately twice a year for hardware issues that could not be managed internally.

The entire team added up to approximately one provider FTE and three “part-time” FTEs. This is an example of a lean implementation team in which members took on multiple roles based on the stage of implementation and on the needs of the practice and patients during different times of the day. This flexible arrangement allowed for a cross-training of staff and shared the burden of implementation between the team members.

**Planning**

The most critical piece of the project was planning for the budget. The physician and the OM created a projected budget for the EHR implementation that was outside their standard operating budget for the year. They projected the cost of hardware, software, and loss of revenue during implementation and for the subsequent six months. This came to approximately $30,000. The costs were based on a client server model, with one application/database server, one back-up server, one scan server, three client machines, one fax server, two printers and one scanner.

The physician had to take into account not just his business expenses, but also make cuts in his private life to meet the needs of this expansion. He was able to get a line of credit from his bank, setting aside some of the profits for 12 months, cutting back on family vacations for two years, reducing dinners at restaurants and factoring an overall reduction on living expenses. This took a significant amount of management and planning to keep it as close to budget as possible. It took approximately 6–8 weeks post-implementation before productivity went up to the pre-EHR level. At the end of one year, the practice began to experience a *recurring ROI* through a combination of
decreased FTE staff and improved billing coding. This provider later chose to join PCIP even though he was already live on eCW because he stood to benefit from all the wrap-around services we had to offer, including systems integration support, assistance with upgrades, updated lab compendiums, access to pilot programs, free basic and advanced EHR training for new staff, access to a wider provider community, etc. Providers can now benefit from the Meaningful Use incentives to offset the cost of EHR.

**EHR Vendor Selection**
The physician conducted an extensive vendor selection process and investigated approximately 12 EHR vendors before making the final selection. He viewed vendor product demos at IT conferences and medical society events and followed the online User’s Forum for the vendor he ultimately chose. He had also assisted a colleague with his vendor selection process, so he was somewhat familiar with the products. His final EHR selection was based on the best value for price.

**Scope of Project**
The scope of the project had to be scaled back due to cost constraints. While the project goal was to go live on the integrated EHR, the practice recognized that, given the rapid changes in technology, they would need to continuously adapt and modify the practice and, therefore, followed more of a staged implementation approach. For example, a bi-directional lab interface was out of the scope of the initial project because very few labs had the necessary technology in place at that time. The practice still submitted lab requisitions on paper and scanned results into the EHR. Setting up the bi-directional lab interfaces occurred only two years later when it became the norm and was not cost prohibitive. The provider also ended up modifying the scope of the project because of cost overruns. The initial goal was to give tablet PCs to the MAs so they could review the status of referral appointments with patients as they waited to see the provider, but they had to design a different workflow once the cost of the hardware became prohibitive.

**Communications**
The project staff recognized that the lines of communication had to be kept open at all times for the project’s success. In a small office, this was easier to do as staff worked in adjoining rooms within earshot of each other. It was still important keep protected time for the provider and PM to communicate regularly, as well as for the PM to meet with the entire staff. They reserved one weekend a month for all staff to come in for a breakfast meeting so that they could get updates on the next month’s plans. This was their chance to give input into the planning process and share any concerns that had not been addressed. This process is especially important to influence members who may still be skeptical or nervous about the transformation that accompanies such a project.

**Project Tools**
The tools available to PMs are extensive and sophisticated. For this small practice, Excel was sufficient for planning and monitoring the budget. The physician and OM used it to create a spreadsheet to plan and track their budget and checked it on a weekly basis for the length of the project. They also used the DOQ-IT toolkit to map out their current and future state workflows. This served as a training tool for new employees, as well as
a means for conducting workflow redesign, making enhancements to the practice and increasing efficiencies.

**Vendors**
The primary vendor the practice had to negotiate with was the reference lab company. This is another example of a staged approach in which the provider had to first focus on interfacing with their primary lab company and then moved on to the secondary lab company and finally worked on an interface with his referring hospital. In the future, the practice would like to work with its diagnostic and imaging company and, with the help of the RHIOs, connect to other providers and specialists in the community.

**Workflows**
The OM created a problem log book in which all tickets opened were logged along with their solution. This became the reference manual and training log for new staff. It also provided the continuity for staff that were out and helped with the resolution of issues. An example of a recurring issue was the fax server would go down periodically and the solution was to reboot and perform manual instead of automatic Windows updates.

**Lessons Learned**
- Successful EHR implementations require the judicious deployment of PM best practices and the full backing of senior sponsors. If you have one without the other, the project will falter.
- Empower the practice to succeed by sharing best practices from other implementations and develop the role of a Project Manager. This person can oversee the overall implementation or can work closely with the external PM to ensure a smooth rollout. Ideally the PM should be someone who has good organizational skills and is naturally adept at problem-solving and creative thinking. They can also become the first line of support for simple IT issues, thereby reducing the reliance on an IT consultant and helping to keep the project within budget.
- Make sure that both the project and the practice review their respective budgets carefully and check their progress on a weekly or monthly basis. Cost overruns are a common cause of project failures during implementation, especially for small physician offices.
- Participate in other online forums and user groups that are hosted by EHR vendors, professional organizations such as HIMSS and the PMI.

The case study described above took place prior to the passage of ARRA/HITECH and the creation of the Regional Extension Centers (RECs). There are now 60 RECs that provide assistance with implementation and getting the practice to meaningful use. The RECs engage the collective bargaining power of the group in negotiations with lab companies, software and hardware vendors; encourage collaboration with the local Department of Health for mandatory disease reporting; and connecting to RHIOs and other enablers of meaningful use. A PM can get significant assistance by joining the larger community to build on the experience of the experienced.
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REFERENCES