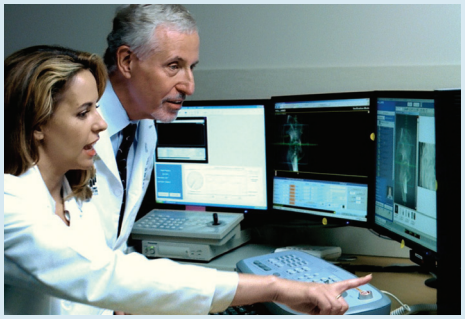
TECHNOLOGY EXPANSION in Support of Community Cancer Care

The NCCCP IT experience

by Beverly Albury, BS; Nancy Harris, MPA-HSA; and Joshua Mann

The National Cancer Institute (NCI) launched the Community Cancer Centers Program (NCCCP) in 2007 as a three-year pilot, forming a public-private partnership with 16 community hospitals to explore the best methods to enhance access to care, reduce cancer healthcare disparities, improve quality of care, and expand research within the community setting.[1] The pilot's success led to a network expansion in 2010. The NCCCP now supports 30 participating community cancer centers within 22 states. The 16 original pilot sites documented their collective experiences in a number of White Papers to report on how they addressed program deliverables in specific focus areas with the goal of expanding community-based care. *Oncology Issues* began publishing an ongoing series about the NCCCP pilot and the resultant White Papers with the January/February 2011 edition.[2] This issue features content drawn from the July 2010 NCCCP Information Technology (IT) White Paper.

The experiences of the NCCCP's pilot Information Technology Subcommittee remain timely in light of emerging science where translational research and personalized medicine are increasingly the nexus of clinical care standards. To support this highly integrated care model, community cancer centers must combine and unify data and data collection systems in ways that enhance patient-centered portfolios and enable advanced analytics. This integration requires the expansion of data sharing capabilities, especially given the reality that patients receive care from many different providers in many different settings, using disparate data collection systems.



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Patients diagnosed with cancer want access to the latest treatments with the ability to stay in their own communities where their support systems are well established. With the acquisition of innovative technology and well-trained medical specialists, community hospitals now provide a sophisticated level of care, including new cancer treatments and access to clinical trials. However, the advancement in care options has led to fragmented cancer care in many communities. Patients may have surgery in one location and then go to a clinic for radiation therapy. They might go to yet another facility or stay at home to receive chemotherapy. Today's community cancer centers seek system integration to provide continuity of care and outcome measurements—tools that will help practitioners improve patient care.

NCCCP programmatic efforts have focused on ensuring that patients—especially those from underserved populations—have greater access to advanced care. Part of this access is contingent on the successful deployment of information technology. Sharing the experiences of the NCCCP pilot sites, in both technology expansion and implementation planning, may help the IT departments of other community cancer centers move to a more integrated and expanded technology offering.

Technology Support for Program Goals

The NCCCP pilot was designed to build a community-based research platform to support a wide range of basic, clinical, and population-based research on cancer prevention, screening, diagnosis, treatment, survivorship, and palliative care at community hospitals. Recognizing that research- and outcomes-driven activities stem from data sharing, and hoping to improve continuity of care, NCCCP considered IT a critical and crosscutting component of the core program pillars.

The program established subcommittees to support the

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...the mission of caBIG is to develop a collaborative network that accelerates the discovery of new approaches for the detection, diagnosis, treatment, and prevention of cancer, ultimately improving patient outcomes.

work of the NCCCP pillars; each NCCCP organization provided at least one representative to the IT Subcommittee. This group studied the technology needs and methods of expansion required for a community-based cancer center to enable state-of-the-art cancer care and research while supporting the overall technology needs of the NCCCP. Each site was responsible for having an electronic health record (EHR) and an electronic tumor registry system in place by the end of the three-year pilot period. As part of the NCCCP pilot, sites looked at how the NCI cancer Biomedical Informatics Grid (caBIG®) and related tools might be leveraged.

What is caBIG®?

Overseen by the NCI Center for Biomedical Informatics and Information Technology (CBIIT), the mission of caBIG (*https://caBIG.nci.nih.gov*) is to develop a collaborative network that accelerates the discovery of new approaches for the detection, diagnosis, treatment, and prevention of cancer, ultimately improving patient outcomes. To achieve this mission, caBIG seeks to bring the oncology technology community together with the scientific, clinical, and patient communities.

The caBIG initiative operates through an open development, standards-based information network. Anyone can participate in caBIG and there is no cost to join. The caBIG community includes academic cancer centers, NCI-supported research endeavors, and a variety of federal, academic, not-for-profit, vendor, and industry organizations. caBIG provides research- and outcomes-driven activities stemming from data sharing that can have a significant impact on the patient. Through its work with the NCCCP pilot sites, NCI studied how the resources available through caBIG could benefit the technology expansion needs of community-based cancer centers.

Technology Vision and Strategy

NCCCP pilot sites developed a technology vision and a business strategy to support their respective cancer centers, providers, patients, and the communities they served. The process involved:

- Establishing mission statements
- Documenting organizational governance for the technology needs of the cancer center
- Developing workflows and policies for supporting the business units that comprise the cancer center
- Mapping technology expansion needs to user needs
- Working to establish short- and long-range plans for meeting those technology needs.

At the time of the NCCCP pilot launch, a few sites were already in the process of putting an IT strategy in place. Other sites had the development of an IT strategy on their priority list, but had yet to begin. For these sites, the first step was establishing the cancer center's IT vision, grounded in the reality that community cancer centers often lack sufficient funding to adopt IT tools.

Developing this vision required a great deal of collaboration with department leadership and end users. Through networking and sharing experiences, resources, and tools, NCCCP pilot sites were quickly able to create action plans for improved services. Having IT staff attend as monthly participants in each of the cancer center's departmental staff meetings helped improve operational objectives. Because business needs are often discussed during these meetings, IT staff were able to clearly understand user needs early enough in the process to influence decisions based on the technology department's policies and experience.

Supporting a full stable of disparate and sometimes duplicative systems was a key frustration common to all NCCCP pilot sites. By inventorying systems with mapping to user communities and support needs, many sites were able to reduce or eliminate duplicative services and processes. NCCCP sites also looked at integration strategies to support mutual cross-department needs, such as access to laboratory data, radiology data, and demographics.

This process fostered relationship building and trust between the cancer center departments and IT staff. Departments began to realize that, by working with IT, their needs were more likely to be met, whether through better technology deployment or through a synergistic approach to leadership and budgeting to justify technology spending. Over the pilot period, informatics needs within NCCCP sites were better defined and became more visible, which, in turn, resulted in better funding for technology acquisition. For a few sites, these efforts led to an FTE in the cancer center to support oncology technology and data integration needs.

Baseline Assessment and Goal Planning

After establishing a technology vision and documenting short- and long-range informatics strategies, NCCCP sites reviewed how caBIG tools might meet or supplement their cancer centers' business strategies and how they might implement the tools. Sites also evaluated vendor solutions that might be a better fit for the community cancer setting.

The process began with a baseline assessment of the pilot sites' existing capabilities, in terms of technology platforms, security, infrastructure, operations, and business needs (see Table 1, at right). CBIIT developed a web-based tool for the collection of these data. Once NCCCP sites submitted their baseline assessments, caBIG program support and

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Table 1. Conducting an IT Infrastructure Self Assessment

For community cancer centers looking to improve their IT infrastructure, NCCCP sites suggest conducting a self-assessment first. Questions might include:

INFRASTRUCTURE READINESS

- Does an IT support infrastructure (i.e., help desk) exist?
- Is there an existing infrastructure for providing training to end users in applications?
- Are there formal means for exchange of data between the clinical (hospital) and research data activities?
- Is the computer network bandwidth sufficient for demanding applications (e.g., imaging or gene expression)?
- Are there institutional standards for data and network security?
- Are there institutionally-supported mechanisms for providing outside secure access to servers?
- Are key research and clinical informatics capabilities largely outsourced or insourced?
- Does staff have access to an internet-accessible workstation as part of their work?
- How many locations does the institution have?
- Does the institution make use of mobile computing?
- Does the institution provide wireless computer access?
- What type of security is provided and/or required for wireless access at the institution?
- Does the institution have a central software version and revision control and management process?

INSTITUTIONAL READINESS

- Does the institution host and/or participate in any Cooperative Groups? If so, which ones?
- Does participation in the Cooperative Groups involve data sharing?
- Does the institutional leadership support informatics initiatives?
- What is the size of the cancer community served (i.e., number of cancer treatment beds, cancer inpatient and outpatient visits)?
- Is the institution's current documentation of standards and processes for data collection complete and up to date?
- Does the institution proactively manage processes for continuous improvement and share lessons learned?
- Does the organization have and actively use two-way communications for the purpose of facilitating interactions between IT/informatics staff and their served community, and does it encourage feedback from the prospective user community?
- What are the major communication audience segments within the organization?
- Which have been the most impactful communications vehicles for the cost?
- Is the institution currently sharing data within the organization?
- Is the institution currently sharing data outside the organization?

ORGANIZATIONAL CAPABILITY

- What server operating systems are used?
- What desktop operating systems are used?
- What database systems are supported by the organization?
- Does the institution have supported web browsers? If so, which ones?
- How many total supported users are there at the institution?
- Is there a clinical informatics group that supports the organization?
- Does the institution have internal software development capabilities?
- Is there a standard clinical workstation supported by the organization?
- How many clinical PIs are there (i.e., total number of clinical labs)?
- Do all clinical researchers (i.e., PIs, nurses, physicians) have access to the clinical workstation(s)?

FUNCTIONALITIES SUPPORTING CLINICAL TRIALS OR LIFE SCIENCES RESEARCH

- Is there a standard clinical data management capability for the institution?
- Does the institution have a central clinical trials participant repository?
- Is there an automated function to input laboratory data into clinical data management systems?
- Does the institution have a patient study calendar system?
- Does the institution have software tools for adverse event management and reporting?
- Does the institution manage gene expression data?
- Does the institution manage *in vivo* imaging data?
- Does the institution have a central tissue bank and an accessible associated database?
- Does the institution manage and integrate translational medicine data?

Electronic Tumor Registry

Having an electronic tumor registry that exchanges data electronically was an NCCCP pilot requirement that all sites had in place early in year one of the pilot. This allowed the sites to collaborate with the American College of Surgeons Commission on Cancer (CoC) to beta test a new software solution, Rapid Quality Reporting System (RQRS). This system facilitates data collection in a more real-time manner. Through participation in the RQRS effort, the 16 NCCCP pilot sites are developing processes and workflows that will improve how tumor registry data will be captured in the future. They are also gaining access to valuable, real-time data which helps drive NCCCP quality improvement activities.

CBIIT leadership reviewed the data and provided each site with a Capabilities Analysis Report. The report included an objective weighting, reflecting the site's readiness to deploy technology in accordance with the site's technology vision and strategies. After reviewing these reports, NCCCP sites participated in a phone conference with caBIG program support and NCCCP IT leadership to ask questions and further define intentions. Program support staff updated the Capability Analysis Reports to reflect additional information requested by the NCCCP sites.

The next step included learning more about the resources available to NCCCP sites through NCI's caBIG program and evaluating whether these resources would meet their cancer center's needs. This task was difficult, as maneuvering through the caBIG environment was complex. However, caBIG support staff and CBIIT leadership provided tool demonstrations and individualized support to help NCCCP sites understand how caBIG tools and resources might meet their users' needs.

Once a site had a good understanding of its technology needs and whether caBIG tools and resources could support them, the site completed a detailed Technology Goals Planning document to record its technology expansion plans. NCCCP IT leadership developed a template to standardize the information provided by NCCCP sites, requiring sites to compare the business needs of the cancer center and its departments with the tools available through caBIG or through the vendor community. NCCCP sites compared these potential solutions with their Capabilities Analysis Report to identify where they should make changes to their capabilities to implement a technology solution. The process allowed each site to systematically address technology vision and strategy requirements with available technology solutions to determine which solutions might best meet their identified business needs. Each site detailed implementation plans for the technology selections and conducted an analysis of the level of effort and cost required for potential technology selections. The final Technology Goals Planning document required cancer center executive leadership sign-off from each organization so that the NCCCP understood each site's level of commitment to these plans and vice versa.

NCCCP IT leadership developed a template requiring sites to compare the tools available

Key Stakeholders

To help establish what IT tools and systems would meet an organization's needs, NCCCP IT leadership and caBIG support staff created a series of presentations and materials designed to help sites compare and evaluate caBIG tools with those of the vendor community. The key stakeholder audiences were:

- ***Leadership and decision-makers.*** This group needed information on the overall benefit to the organization, users, and patients. They were interested in cost, time to completion, staff-time requirements, efficiencies gained, and return on investment.
- ***End users.*** These stakeholders were pressed for time, as they were busy with clinical duties and patient care. Information for this group often needed to be delivered in 10 minutes or less. End users were more interested in how the tools met their needs, saved time, impacted workflow, improved support, and in how they would be trained.
- ***IT.*** This group required materials that discussed the practicalities, such as hardware needs, platforms, security, documentation, time to implement, training, certification, support needs, and costs.

With the three stakeholder groups in mind, caBIG support staff and NCCCP IT leadership provided sites with:

- Tool-specific overview slide decks with notes fully fleshed out so that each site's IT lead could use these more general materials to engage any audience
- Detailed slide decks targeted to specific stakeholder group information needs
- Recorded video demonstrations of caBIG tools showing a typical user experience, available at the viewer's convenience
- One-on-one teleconferences with each of the site's stakeholder groups, tailored to fit their unique needs and scoped to the specific audience.

Over time, caBIG determined that these types of materials were also in high demand from many other groups outside of the NCCCP. This finding led to the development of caBIG Knowledge Centers, NCI-funded organizations that provide expertise and support for caBIG domains and applications.

After reviewing more than 40 caBIG applications, NCCCP pilot sites identified the following tools as the most useful for community-based cancer centers:

- Clinical trials management systems, either as a suite of applications or in some cases a select few applications (e.g., Patient Study Calendar, Cancer Adverse Event Reporting, Patient Registry)
- Cancer tissue management tools

to standardize the information provided by NCCCP sites, business needs of the cancer center and its departments with the through caBIG or through the vendor community.

- Imaging archive and annotation tools
- Cancer array data collection and analysis tools.

Many NCCCP sites also identified commercial-off-the-shelf solutions that could increase integration and add functionality to existing platforms at their organizations.

Implementation and Deployment Planning

Planning for implementation of the technology solutions took most of the pilot's second year. NCCCP sites used the Technology Goal Planning document as the starting point for creating a Technology Implementation Plan, a detailed document that defined how the site would mobilize to deploy technology. The Technology Implementation Plan included:

- Costs, such as hardware, software, materials and labor
- Operational organization components (e.g., workflow committees, SOP updates, legal reviews)
- Pre- and post-implementation project measurements
- Risk identification and mitigation strategies
- Implementation milestones with associated timelines.

NCCCP sites provided data-sharing plans and specified any necessary steps for legal agreements to use the technology or share the data to meet end users' needs. This process often required working with the organization's Institutional Review Board (IRB).

NCCCP sites were not contractually obligated to adopt or adapt any technology solutions in the course of the pilot program, though they were required to identify and document plans for technology expansion deployment. NCI was particularly interested in how the community setting would be able to adopt caBIG tools, principles, and practices. While these open source tools are free, they may entail costs; hardware or software is often required to enable the solution and sometimes licenses must be secured. Implementation of certain tools may require contractor services if the technical skill sets are not readily available in the cancer center. However, caBIG tools can be adopted at a cost substantially lower than commercial sector solutions.

NCCCP sites that pursued commercial off-the-shelf solutions identified a number of barriers to caBIG tool adoption, including:

- caBIG tools do not come with a 7-day-a-week, 24-hour-a-day, multi-tiered support service with the option of onsite support and training
- caBIG tools, while open source, still entail significant costs and sometimes require new software, licensure, servers, and security parameters to deploy
- caBIG tools are built in an interoperable, standards-based manner; however, the cost of custom interfaces for integration is expensive and can sometimes be a limiting factor
- Upfront costs associated with local installations are difficult for smaller community cancers to afford and require them to limit their initial investments.

CBIIT and caBIG program support took note of these issues. CBIIT worked closely with NCCCP sites to understand their unique implementation needs; where possible, they helped to develop strategies that would make adoption of caBIG tools easier. In some cases, NCCCP sites helped caBIG improve installation instructions, documentation, and training materials, thus helping to improve the resources available to other community-based cancer centers.

On the other side of the equation, some NCCCP pilot sites found caBIG tools did meet their needs. Those pilot sites that chose to adopt caBIG tools identified the following benefits:

- Open source solutions mean no to low acquisition costs
- caBIG tools are built to be interoperable and thus help to integrate systems
- caGrid allows access to a grid without the cost of development and maintenance
- Data sharing is a core principle of caBIG, so its tools and policies can be leveraged with little to no modification needed for state and local laws.

Accordingly, a number of pilot sites adopted caBIG tools within the pilot period. For example, Christiana Care adopted caTissue and NCI Biomedical Imaging Archive (NBIA); Our Lady of the Lake adopted NBIA; and St. Joseph Hospital adopted C3D, a cancer clinical trials data management system. Several other pilot sites planned to adopt caBIG tools, but as the economy slowed the timelines stretched, stalling technology progress in most healthcare organizations nationally. At the conclusion of the pilot period, several other caBIG tools were under consideration for future adoption by some of the pilot sites, including: caArray, Patient Study Calendar, caAERS, CTODS, caXchange, and C3PR.

Adopting an EHR

At the time of the NCCCP pilot launch, most sites either already had an EHR solution in place and were expanding deployment, or had selected a vendor and were planning for implementation. NCCCP sites that did not have an EHR at the organizational level worked to study requirements, conduct vendor evaluations, make a selection, and deploy that solution. By the end of the pilot's second year, all sites had EHRs in place at the organizational level.

NCCCP pilot sites recognized that EHRs did not

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Table 2. Clinical Oncology Requirements for an EHR

For community cancer centers looking to implement an oncology-specific EHR, NCCCP and ASCO have identified these core requirements. For a full list go to: *www.asco.org*.

DEMOGRAPHICS

Patient Demographics
- Name, DOB, MRN
- Contact information
- Race and ethnicity
- Language preference

Treating Physicians and Primary Physicians
- Name
- Subspecialty
- Address
- Phone and fax numbers

DIAGNOSIS

Primary Cancer Diagnosis
- ICD9, ICD10, or more clinically relevant system

Pathology
- Site
- Histology and pathology
- Biomarkers (ER, HER2, c-Kit, etc.)
- Molecular markers (bcr+, etc.)
- Chromosomal markers

Primary Staging
- AJCC for relevant diagnoses
- Tumor registry staging information for non-AJCC diagnoses

Metastatic Sites (if applicable)

Pathologic Features of Metastatic Site
- (e.g., transformed lymphoma or ER negative breast cancer)

List of Co-morbid Conditions
- Should be organ-based choices

PRIOR TREATMENTS

Prior Cancer Surgery
- Type and date

Prior Chemotherapy and Biotherapy Regimens
- Table format with regimen, dates, best response, reason for discontinuation

Prior Radiation Therapy
- Site and date

CURRENT PLAN

Intent Goals of Therapy
- Adjuvant
- Neoadjuvant
- Advanced/Palliative

Performance Status
- (including Karnofsky, etc.)

Sites of Disease Monitored
- Add choices of adjuvant (n/a), measurable, evaluable
- List of indicator lesion sites

Human Body Graphic
- Front and back for recording disease

Chemotherapy or Biotherapy Regimen Planned

Clinical Trial Protocol Number

Height, Weight, Body Surface Area, and Starting Doses

Duration of Treatment and Number of Planned Cycles

Radiation Therapy Planned

Surgery Planned

Pain Assessment

Major Toxicities Experienced

Hospitalizations Required for Toxicity

Disease Status at Completion of Treatment

Palliative Care and Hospice Plan

Ability to Make an Electronic or Print Copy of Treatment Plan
- Include treating physician and contact information (perhaps as a header or at the signature line)

Table 3. Oncology-Specific EHR Functionality

For community cancer centers looking to implement an oncology-specific EHR, NCCCP sites and ASCO have identified these core functions. For a full list go to: *www.asco.org*.

CHEMOTHERAPY AND DRUG MANAGEMENT

- Ability to order electronically.
- Ability to interface with pharmacy system.
- Ability to interface with electronic medication administration record.
- Ability to choose from predetermined regimen order sets of standard regimens or study protocols (configurable by institution).
- Electronic link to protocol from the order.
- Ability to have dates fill in automatically for multi-day and multi-week therapy.
- Ability to reorder from prior cycle.
- Ability to modify orders and doses.
- Document treatment parameters on order.
- Ability to sign off electronically on each cycle.
- Ability to verify orders electronically by nursing and pharmacy after MD/NP signs.
- Ability to use previous height/weight or apply new height/weight.
- Chemotherapy order sets, including NCCN guidelines and order sets, internal order sets, and access to a library of standards-based regimens and standards-based protocols.

BILLING CHARGE CAPTURE AND INVENTORY CONTROL

- Ability to interface with existing billing management system and inventory control system.
- Ability to track drug supply chain of events (inventory received, source, dose dispensed, lot number, dose discarded and why, waste record, expiration record and notification, and spill record and documentation). NOTE: These pharmacy functionalities could be handled outside of the EHR by the pharmacy management system.
- Ability to track the course of the drug (pharmaceutical company, clinical trial, vendor). NOTE: These pharmacy functionalities could be handled outside of the EHR by the pharmacy management system.
- Chemotherapy coding (J-codes) and reimbursement management should be part of a pharmacy system.
- Oncology specific procedure codes and drug administration billing codes (time dependent) for a comprehensive record of charges.
- Mechanism for insurance pre-authorization. Ability to electronically submit notification to billing office and billing system OR generate a report that can be taken to billing (configurable based in organizations needs).
- Billing office alert for all drugs and treatments to approve or authorize.
- Access to approved drug compendia.

CALENDAR AND SCHEDULER

- Alerts and pop-ups to remind caregiver of scheduled treatments, etc.
- Ability to schedule regimens/full course of care to include: physician visits; education and training; lab and radiology; infusion and injections.
- Ability to update calendar easily and push dates accordingly.
- Chemotherapy chair scheduling.
- Ability to print off calendar of treatments, lab and radiology appointments, and physician appointments to give to patient.
- Regimen-specific calendar that can be printed off for patient that includes the drugs being given and taken; lab, radiology, and physician appointments; side effects, etc.
- Calendar for patient that records the day oral medications should be taken and time interval with space to record actual time taken and any side effects experienced. Either a printable calendar that can then be scanned into the patient record when complete or through a patient portal, so patients are able to provide information electronically to their own record.

Implications for the Wider Oncology Community

Information Technology, now a critical component of care, comes at a cost—in dollars, people, and time. IT is particularly challenging for community cancer centers, where IT departments are small and resources are limited. Often, technology solutions at community cancer centers comprise a stable of disparate systems. Many of the domains within a community cancer center continue business operations in a paper-based system. Although the cost of technology is high, without the infrastructure, platforms, equipment, and security parameters in place to enable the new solutions necessary to drive cancer care forward, progress is even further hampered. And cost is not the only hurdle. The challenges involved in implementing new technologies and solutions can be as big or bigger a barrier. In short, the situation can seem overwhelming.

As part of the NCCCP pilot, the IT Subcommittee was required to write a White Paper that would discuss the pilot sites' experiences assessing the need for technology expansion to meet the business needs of a community cancer center. During the pilot, NCCCP sites reviewed NCI cancer Biomedical Informatics Grid (caBIG®) tools and resources. Where caBIG software and support solutions were identified as appropriate for technology expansion, the pilot sites evaluated how they might operationalize to support these deployments within a community-based setting. However, the subcommittee did not solely focus on caBIG because the pilot sites wanted to look at the global technology needs required to support community-based cancer centers.

The main objectives for the IT White Paper were to:

- Provide a roadmap for future NCCCP sites to leverage these recommendations and lessons learned from the pilot effort for their own technology implementation processes
- Share information with non-NCCCP community cancer centers and provide recommendations for the evaluation and implementation of technology expansion solutions based on the experiences of the 16 NCCCP pilot sites.

For community-based cancer centers looking to expand technology portfolios and implement information technology products based on business needs, NCCCP pilot sites offer the following key recommendations:

- ✔ Actively engage senior leadership in the entire process. Key steps include: determine if a real need for tool adoption exists, analyze the business need, understand the tool selection evaluation criteria, and communicate to end users the value of the tool.
- ✔ Gain senior level sponsorship and clearly define the need for additional IT resources (whether on a contractual basis or an FTE). Often community cancer centers do not have sufficient IT technology resources in place to adequately support a large-scale IT implementation. To overcome this challenge, senior level support is essential to obtain and maintain the appropriate level of funding.
- ✔ Have a strong governance model. This step is critical to effective IT implementation. Specifically, have robust policies, principles, and procedures in place to manage any potential risks or issues that may arise. This step can make the difference between success and failure of implementation.
- ✔ Rigorously define the business requirements *before* choosing a vendor. This helps focus the evaluation process on the real needs of the organization rather than on vendor-induced needs. It can also be an effective way to prevent vendor up-selling.
- ✔ Understand the functionality of the tools being evaluated. This recommendation may seem obvious, but decisions may be affected by other factors, such as the quality of the presentation, rather than the actual usability of the tool.
- ✔ Ensure a sufficient level of support (comparable to that of commercial vendors) can either be provided or acquired when adopting caBIG IT products (e.g., caTissue and NBIA).
- ✔ Train end users prior to the go-live date for the implementation of all technology tools to minimize any potential business disruption. Consider identifying "Super Users" (end users specially trained by the vendor) to train and support other end users.

While IT implementation is likely, at times, to be a challenging process, the benefits include the potential to improve the quality of patient care and, in particular, improve care for underserved communities across the country.

include all of the fields required to support the highly specialized and unique domain of oncology. Therefore, a number of sites began to engage CBIIT and NCCCP IT leadership in gap analysis activities that required a detailed review of the specific needs of the oncology provider. After concluding that no vendor solutions met all the complex needs of the oncology domain, the pilot sites asked CBIIT and NCCCP IT leadership to help address the lack of suitable commercial products to fit their requirements. At the same time, the American Society of Clinical Oncology (ASCO) was handling a similar request from its membership. ASCO put together a work group to study the lack of oncology-supportive EHRs and published initial findings. The ASCO work group developed a two-page summary of the specialized needs in an oncology EHR. In October 2007 ASCO hosted a conference, bringing

Starting in 2011, practitioners can take advantage of incentives for "meaningful use" of Health Information Technology.

together oncology providers and vendors to discuss how the vendor community might meet the needs of the oncology community.

CBIIT approached ASCO about working collaboratively with NCCCP sites to address this mutually identified gap in vendor support, and the organizations established a number of work groups that developed a robust set of requirements for an oncology EHR. The effort produced the Clinical Oncology Requirements for an EHR (CORE) document, published in October 2009 at ASCO's bi-annual EHR conference. ASCO brought private practice clinical oncologists to the table, NCCCP pilot sites provided a host of domain engagement, and CBIIT brought clinical and standards experts. Although this project was not an NCCCP contract deliverable, sites volunteered many hours to help produce the CORE document. They participated in frequent, lengthy telephone conferences and document reviews, as well as collaborative efforts within their organizations to ensure inclusion of all appropriate domains. The CORE document includes high-level and user-specific oncology EHR functional requirements. Table 2 (page 50) and Table 3 (page 51) highlight key elements from the requirements document.

Around the same time that the CORE document was being developed, the federal government began encouraging practitioners to use electronic solutions for information exchange. Starting in 2011, practitioners can take advantage of incentives for "meaningful use" of Health Information Technology (HIT). These incentives provide practitioners higher Medicare or Medicaid funding for "meaningful use" of certified EHRs. Legislation includes a 2015 deadline requiring all physicians to implement EHRs and begin sharing data in "meaningful" ways or face reimbursement adjustments. These legislative mandates and incentives have created a new urgency in terms of EHR adoption, implementation, and meaningful use.

Going Forward

The work to expand information technology in NCCCP pilot sites was a transformative experience. As the sites' IT departments forged more collaborative relationships with the cancer center departments they served, pivotal changes occurred that improved understanding of processes and technology needs. Unifying IT departments with the other hospital domains allowed stronger business alignment and higher visibility for technology needs in the organizations' financial lines. With personalized treatment portfolios on the horizon and the need to improve technology access to better coordinate and deliver care, having a sound technology platform with a robust stable of business support technology in place is essential. Sharing the NCCCP IT Subcommittee's experience with the broader oncology community may benefit other community cancer centers as they evaluate and expand their own technology platforms.

Beverly Albury, BS, is manager of Oncology Information Technology at The Nancy N. & J.C. Lewis Cancer and Research Pavilion at St. Joseph's/Candler in Savannah, Ga.; Nancy Harris, MPA-HSA, is administrator for Cancer Services at The Center for Cancer Prevention and Treatment, St. Joseph Hospital in Orange, Calif.; Joshua Mann is manager, Quality IT Systems at ASCO, but was IT specialist at St. Joseph Hospital in Orange, Calif., when the IT White Paper was written.

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