Readying the Health IT Workforce for Patient-Centered Team Based Care: Understanding Training Needs

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Table of Contents

Executive Summary

Introduction

Electronic health record (EHR) technology is available to over half of the nation's eligible professionals participating in the meaningful use program. Now in place, these systems need to be effectively utilized by health care providers and their staff so providers achieve the next step in healthcare transformation by changing clinical care practice and delivery of healthcare services that support patient-centered, team-based care (PCTBC).

To effectively utilize EHR systems to achieve the goals of PCTBC the health care provider work force s must have competency in Health IT. The need for trained health IT staff is projected to increase as more workers retire and the need for additional management and technical skills increases. The Bureau of Labor estimates that by 2018 there will be a need for an additional 35,000 workers. PCTBC presents significant changes to the roles of workers and the skills employers seek in candidates. As the transformation to PCTBC takes place the demand for workers with knowledge of not only information technology, but also healthcare, business and management in additional to strong communication skills will increase.

Methodology

The Office of the National Coordinator Workforce program convened a panel of experts to discuss health IT workforce training needs to support team based, patient-centered healthcare delivery. The panel reviewed innovative approaches to delivering training and education powered by technology, challenges encountered in providing this education to incumbent workers and new hires and identifying skills required for each health care workforce role.

Results

The main conclusions of the panel were that readying the health IT workforce for Patient-Centered Team Based Care requires a multitude of changes. PCTBC requires changes to workflow, policies, and procedures as well as the expansion of training programs and educational curricula. Practices changing to a PCTBC model must also take into account the cost of change and adapting technologies to appropriately train and retain employees to ensure high-quality care delivery. New and incumbent health IT workers need a curriculum that reflects the PCTBC model of care, learning clinical and technical skills as well as interpersonal skills to assist the healthcare service provider's quest to deliver patient-centered team based care.

Panel Members

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Introduction

To accelerate the use of health information technology (Health IT), Congress and President Obama signed into law the Health Information Technology for Economic and Clinical Health (HITECH) Act as part of the American Recovery and Reinvestment Act of 2009. The HITECH Act authorized Centers for Medicare and Medicaid Services (CMS) to provide financial incentives to eligible hospitals, Critical Access Hospitals (CAHs), and eligible professionals to adopt and meaningfully use certified electronic health record (EHR) technology to improve patient care. The HITECH Act also authorized the Office of the National Coordinator for Health Information Technology (ONC) to establish and administer programs to guide physicians, hospitals and other key entities, as they adopt and meaningfully use certified EHR technology as established in subsequent Federal regulations.[1]

Section 3016 of the American Recovery and Reinvestment Act of 2009 under Title XIII authorized the creation of a program to assist in the establishment and/or expansion of education programs to train a skilled workforce to ensure the rapid and effective utilization and development of health information technologies (in the Unites States health care infrastructure).[2]

In 2009, estimates based on the data from the Bureau of Labor Statistics (BLS) and independent studies indicated a shortfall of approximately 51,000 qualified health IT workers would be required over the next few years to meet the needs of hospitals and physicians as they move to adopting an electronic health care system, facilitated by the HITECH Act.[3]

To meet the projected workforce needs $118 million was set aside in funding for workforce development programs. As a result of this funding, four initiatives were launched the (1) Curriculum Development Centers, comprising of five universities that were tasked with developing curriculum for the Community College programs, the (2) Community College Consortia, the largest program, focusing on the development and implementation of a six month training program designed to train professionals with a background in health care or IT on the knowledge and competencies required to facilitate health IT adoption and implementation. The community colleges were required to ramp up their training capacity over time in order to train 10,500 professionals per

year across the five funded consortia. The five consortia comprised of a total of 82 community colleges, the (3) Competency Exam which assessed the competencies of students and professionals in the field, and the (4) University Based Training which was designed to provide training for graduate and post-graduate level students. Nine Universities were funded under the grant.[4]

Despite graduating close to 20,000 students from 2010 to mid-2013 the shortage of health IT professionals persist. Healthcare providers nationwide continue to have difficulties hiring and retaining skilled information technology professionals who are required to meet the goals of the HITECH Act.[4, 5]

Since, the implementation of the HITECH Act in 2009, data show steady increases in the adoption of EHRs and key computerized functionalities related to EHR Incentive Programs Meaningful Use Criteria among office-based physicians and non-federal acute care hospitals.[2] In 2012, nearly three quarters of office-based physicians had adopted any EHR system, up from 2009 estimates of 48%.[4, 5]

As of April 2013, more than 291,000 professionals representing more than half of the nation's eligible professionals have received incentive payments through the CMS Medicare and Medicaid EHR Incentive Programs. Over 3,800 hospitals, representing 80% of eligible hospitals, and including Critical Access Hospitals, have received incentive payments through this program as well.[5] Between May 2011 and July 2013 more than $9.5 billion in Medicare EHR Incentive Program payments have been made and more than $6 billion from January 2011 to July 2013 has been paid in Medicaid EHR Incentive Program payments.[4] Fifty seven per cent of eligible providers and 77% of hospitals have received Medicare or Medicaid incentive payments for adopting or meaningfully using EHRs amounting to a total of $14.6 billion dollars spent out of the allocated $20 billion.[5,6] These numbers exceed projected goals and showcase successes of the HITECH Act. However a tremendous amount of work still remains to be done to meet the goals of the triple aim.

Now that EHR technology is available to over half of the nation's eligible professionals, the Health IT Workforce's next focus is to help providers achieve the next step in healthcare transformation by changing clinical care practice and delivery of healthcare services that support patient-centered, team-based care (PCTBC).

This report will highlight the components of PCTBC and the health IT workforce training needs required to help providers successfully change behavior and clinical practice that are supportive of the new healthcare model. Report development was a result of an environmental scan and panel discussion that was convened by the Office of the National Coordinator for Health Information Technology's (ONC) Workforce Program. Panel members were chosen for their diverse perspectives and technical expertise in the field of health care and health IT. As stated by Judy Murphy, Deputy Director, ONC, during the panel discussion, PCTBC requires "changing the habits of healthcare" and supporting the providers transition from "a care centric model to a patient-centric model" focusing not only on delivering the right care at the right time during acute illnesses but also supporting health and wellness through preventative care, management of chronic conditions and coordinating care needs throughout the continuum of care experience.

Definitions

Patient centered care – Requires putting the patient at the center of all experiences. As defined by the Institutes of Medicine in the 2001, C*rossing the Quality Chasm,* patient-centered care is "care that is respectful of and responsive to individual patient preferences, needs, and values and [ensures] that patient values guide all clinical decisions."[7] And former CMS Administrator, Don Berwick, further defines patient centered care as "The experience (to the extent the informed, individual patient desires it) of transparency, individualization, recognition, respect, dignity, and choice in all matters, without exception, related to one's person, circumstances, and relationships in health care."[8] In the Advanced Primary Care Demonstration Project, The Center for Medicare and Medicaid Services has identified the National Committee for Quality Assurance (NCQA) Patient Centered Medical Home (PCMH) recognition as a mechanism of care delivery that can achieve patient centeredness resulting in care improvements, health promotion and reduction of care costs to Medicare beneficiaries.[9]

Team based care – In the October 2012 Institute of Medicine Report *Core Principles & Values of Effective Team-Based Health Care*, described "Team-based health care is the provision of health services to individuals, families, and/or their communities by at least two health providers who work collaboratively with patients and their caregivers—to the

extent preferred by each patient—to accomplish shared goals within and across settings to achieve coordinated, high-quality care."[10, 11]

A definition that was previously derived from the work of Naylor MD, Coburn KD, Kurtzman ET et.al., which was showcased in a white paper presentation *The Team-Based Primary Care for Chronically Ill Adults: State of Science. Advancing Team-Based Care,* during the American Board of Internal Medicine (ABIM) Foundation meeting to Advance Team-Based Care for the Chronically Ill in Ambulatory Settings. Philadelphia, PA; March 24-25, 2010.

Health Information Technology (Health IT) – As defined by ONC Health Information Technology: a Tool to Help Clinicians Do What They Value Most Fact Sheet: Health IT is an important tool encompasses a wide range of electronic technologies that can be used to improve clinical practice and patient health. Health IT enables (1) Access up-to-date evidence-based clinical guidelines and decision support, (2) Improves the quality of care and safety to patients (3) Provides proactive health maintenance for patients and (5) Supports coordination of patients' care with other providers through the secure and private sharing of clinical information.[12]

Methodology

Guiding Questions to Understanding

In preparation for the scan and panel discussion, six categories were identified with the development of supportive questions to help explore the components of PCTBC and to gain an understanding of skills and knowledge needed by the Health IT workforce to support this new model of care. The categories and primary questions were (1) People: Who comprises the health IT workforce and how are they -involved in the PCTBC process? (2) Products (tools and technology): How do the tools and technology that are being incorporated into the healthcare delivery system impact the PCTBC model? (3) Processes and Procedures: How do workflows, care coordination, care transitions, and models of care like ACO/PCMH support PCTBC? (4) Policy: How does the structure of federal rules, regulations, payer incentives and organizational programs impact the healthcare system needs and workforce preparation? (5) Payment (payment reform,

incentives): How does payment reform and other alternative payment models impact healthcare delivery like bundled payments, capitation and/or shared risk models? And (6) Pedagogy: What education approaches, both current and those expected in the future support PCTBC?

Literature Review/Environmental Scan

Prior to the ONC Workforce subject matter expert (SME) panel meeting, an environmental scan was performed by utilizing the expertise of the panel members. These SMEs from various sectors were asked to respond to the above questions and provide 3-5 articles that described the context of their responses and/or reflect the current state of healthcare service delivery and workforce preparation needs they are currently experiencing. In total, 45 articles were submitted and reviewed. (Appendix B).

Panel Discussions

On June 6, 2013, the Department of Human Health and Services, ONC, Office of Provider Adoption Support (OPAS): Workforce Program convened a panel of 12 stakeholders (Appendix A) to discuss Health IT workforce training needs to support team based, patient-centered healthcare delivery and review competency-based learning approaches. Their discussions highlighted how instruction could be customized to accommodate individual learning styles and areas of interests. In addition participants discussed innovative approaches to delivering training and education powered by technology, challenges encountered in providing this education to incumbent workers and new hires and identifying skills required for each health care workforce role.

Results

The environmental scan and panel discussions highlighted opportunities and challenges with PCTBC and validated findings from a 2007 report distributed by the Commonwealth Fund *Patient-Centered Care: What Does It Take?* by Dale Shaller which stated that in order to support patient centered care, leaders of healthcare

organizations need to ensure the following infrastructure and processes are in place "(1) top leadership engagement, (2) a strategic vision clearly and constantly communicated to every member of the organization, (3) involvement of patients and families at multiple levels, (4) a supportive work environment for all employees, (5) systematic measurement and feedback, (6) the quality of the built environment, and (7) supportive information technology." When these key factors are present not only do they support patient-centered care but they fully support the PCTBC model enabled by Health IT.[13]

The challenges of getting to PCTBC include the inadequate quantity of healthcare workers, variance in identification of training needs, difficulty of behavioral change and the cost of implementation. Findings that represent these complexities are presented, below.

People

Concurrent with a growing need for more healthcare workers, the implementation of a PCTBC model is requiring new workforce competencies and the adoption of new standards for the delivery of healthcare services. The current worker shortage combined with the expected future need is staggering. The interpersonal interactions of care delivery supporting PCTBC present a dramatic shift in the doctor/staff/patient relationship resulting in significant changes in the roles of incumbent health care workers. As a result of the staffing shortages and shift in the patient care model to a team based approach partnerships need to extend beyond that of the patient and doctor to collaborative partnerships among the entire interdisciplinary care team. This requires breaking down the traditional hierarchy structure in the healthcare environment so the development of key partnerships for all colleagues can exist to promote team based care.

Quantifying the Health Care Worker Shortage

Health IT staff needs are high, as is evident in the Bureau of Labor's estimate that by 2018, there will be a need for an additional 35,000 workers; ONC's estimate was 51, 000 in 2009. HIMSS' 2008 report on the need for health care workers to support EHR implementation identifies a need for 40,000 additional workers.[14, 15] Other sources reveal that the current state of hiring varies by level of electronic health record (EHR) adoption. A 2010 survey of 245 healthcare executives indicated that 58% planned to increase health IT staff over the next 12 months, 49% reported difficulty recruiting staff, and of this number 70% reported the major reason being the lack of availability of IT professionals in the market.[3] Recruiters may find difficulty filling open positions with people who have the desired balance of clinical and technical skills.

Several key factors may be contributing to workforce shortages include; age, increases in turnover, professional isolation, lack of educational opportunities, and difficulties with recruitment and retention.[16] Shortages due to age remain a concern across the country as the percentage of Americans over 65 continues to rise resulting in more retiring health care workers and more people requiring health care.[16, 17] Within the health care field, turnover appears to be less associated with age and more closely linked to "burn out." Educational opportunities must certainly grow and, as noted below, evolved to support PCTBC. In particular, are the needs of incumbent workers who must work on studies in the evenings and weekends and when their studies are not employer sponsored, must seek online, self-paced or find other academic opportunities. Lastly, difficulties associated with the cost of recruitment will linger in today's current model however, changes such as early introduction (K-12) to allied health care professions as a career path will help to alleviate the current shortages and incumbent worker training needs.

Further compounding the issue is the projected shortage of physicians. The "AAMC estimates, the United States faces a shortage of more than 90,000 physicians by 2020—a number that will grow to more than 130,000 by 2025."[18] As a result of the impending physician shortage, healthcare team members are now finding opportunities to practice at the top of their licenses which is necessitating the need to incorporate health IT into their clinical practice. For example, direct care workers and medical assistants are now assisting with care coordination. These new job functions require an

understanding of various clinical roles and responsibilities as they relate to clinical practice. In addition, the ability to facilitate communication among an interdisciplinary team becomes critical for all members of the health care workforce.

Staffing Skills Requirements

The implementation of PCTBC, supported by health IT, brings about many challenges for new workers and incumbents, alike. Both groups will find interpersonal dynamics to be an unexpected focus and new technologies will emerge that will have to be learned and integrated into their workflows. On the job success will likely stem from a work environment with a consistent understanding of the transformation process, visible leadership and support, and established outcomes that can be measured against contextual factors during delivery of care.

The most common positions for which employers are recruiting in the health IT space include those related to information management, clinical informatics, and information technology support (e.g. equipment, development/programming, and software support).[19] The 2013 HIMSS Leadership Survey listed Clinical Application Support, Clinical Informatics, and Network and Architecture Support as the top three Health IT Staffing needs since 2010.[20]

In support of these staffing needs, there is an increasing need for education in the areas of information technology (IT), legal and regulatory issues, reimbursement methodologies, and healthcare information systems. However, medical directors and CMIO's have stated that they value management skills over these technical skills. Specifically, they identified communication, leadership, and consensus building as the most important skills.[23] Other sources in the literature indicate an emphasis on personal values as well as the need for knowledge not only of information technology, but also of healthcare, business and management along with strong communication and decision support skills.[15,21,23] Hiring programs will be well served to include assessments of honesty, discipline, creativity, humility, and curiosity in their hiring process. Employers and staffing agencies will be looking for candidates with knowledge not only of information technology, but also of healthcare, business and management, and with

strong communication skills and the ability to work across boundaries within organizations.[23]

Assisting incumbents to make the transformation to the new PCTBC model may prove more taxing, on both them and the business, than in training new workers. This may be due to long held understanding and expectation of the provider/staff/patient interaction model. However, bringing in new staff to overcome this challenge presents a tradeoff that is not easily dismissed; the incumbent worker is grounded in the business, knows the patients, and already has the trust of the business and their coworkers.

Approaches for assisting the incumbent working in transforming to the PCTBC model include involving staff in every level of the transformative process discussion and training, developing a common understanding of required skills and expectations, and providing career development pathways that are non-linear.

Developing the education and process to support PCTBC holds many challenges. State licensure can be very problematic and be a major barrier to qualifying new workforce members. Similarly, in certification and certificate programs, there is no standard for which employers can reliable hold expectations for the knowledge and quality of certified applicants work.

Products/Technology

There is a high need for successful use of technological innovations such as tele-health monitoring devices, behavior sensing mobile applications, and diagnostic tools on smart phones in order to engage practitioners and patients in new ways and to expand the continuum of care.[11,15] A key tool is the integration of systems as it links data sources and allows access where necessary and, once fully in use, can be used in other modalities such as mobile devices and tablets. The provision of tablets and smart phones to non-medical home care providers in order to allow them to capture vitals and keep care team members apprised of health status changes will help to bridge gaps in care and support PCTBC. The use of all health IT tools must be carefully planned and barriers for the different members of the care teams need to be addressed for their successful use.[12]

In addition to technology hardware innovations, health IT needs to go beyond the capture of patient data and allow for the collection and tracking of both process and outcome measures. In a PCTBC model, all team members need to know how they are doing in relation to the patient outcomes in addition to other PCTBC teams. Therefore the data needs to be easily collected as they perform their work and then abstracted and reported. Whether data is published as score cards by individual, teams or facilities, transparency is a key factor in PCTBC so that everyone knows the progress being made. Measures need to be linked to team performance in addition to individual performance reviews as well to have the process truly embedded in the organization's culture. In addition the performance incentives need to be identified and rewarded for all members of the PCTBC team. When data abstraction and analysis is a part of PCTBC, baselines can be established both for individual and patient population and patient outcomes can be reported against as it relates to the performance of the team. This reporting can be used to reinforce clinical practices leading to positive outcomes and re-evaluation of practices that may need to be changed to correct negative outcomes.

Processes and Procedures

The research on team-based care consistently cites that team base care requires health providers and all care team members to work collaboratively with patients and their families to accomplish goals across all settings High performing processes and procedures for this type of care coordination will need to combine communication skills in clinical support and information management to change behaviors of both health care workers and patients in order to yield better health outcomes. Video, telephone, and electronic text are vital modes of communication that will support care coordination.

Improving health levels and controlling costs of care require changes to workflows. A portion of this change includes increasing access to the longitudinal care record of a patient so that providers may adequately address gaps in care. A shared medical record across inpatient and outpatient settings has been critical to realizing efficiencies and promoting clinical excellence.[22] Presently, the Patient-Centered Medical Home (PCMH) model is showing promise as a means of providing coordinated care in a cost-effective method. Concurrent with the use of clinical system which combines patient data from

multiple sources including EMR, lab, pharmacy, claims, and hospital discharge data, it is wise to implement the use of a patient portal to advance the value of patient-centered team based care.

Transforming a practice into a PCMH or an Accountable Care Organization focuses processes and procedures on the values of PCTBC which include giving high quality coordinated care. Likewise, establishing processes for empowering and recognizing staff, educating staff on the big picture and providing transformative leader and feedback aligns with successful PCTBC models.

Transformation into a high-quality team-based practice is costly. Teams should be targeted to situations in which the transactional costs of team care are outweighed by the benefits in terms of health outcomes. Yet, team care can be cumbersome and may increase medical errors when members of the PCTBC team have not developed team skills. The following list identifies principles of team-based care which support a successful PCTBC model.[15]

- Shared goals
- Clear roles
- Mutual trust
- Effective communication
- Measurable processes and outcomes (outcomes and team functioning)

In many practices, change begins as an initial flurry of physician-led, just-do-it, top-down actions. Although initially successful in some practices, this approach proved ineffective in the long-term. This may, in part, be due to the teams need for a sense of psychological safety and trust. The teams are made up of diverse practice members with differing levels of administrative power[23] and traditional models of health care do not include the collaborative health care decision making found in PCTBC.

Policy

Policy reform for the overall healthcare delivery system and payment system is a critical component in achieve nationwide success in PCTBC. The Commonwealth Fund along with several other well-known entities have made several policy recommendations which included modifying the government infrastructure support and focusing on improving provider training and regulatory changes to facilitate integration amongst different EHR systems.[24, 25] Other changes to policy may come through the development of an EHR Competency Model, which documents the necessary competencies for health workers interfacing with the ever-changing workplace technology.

In general, components recommended for inclusion in policy reform activities include the following:

Consumer

- Driving the consumer to PCTBC
- Raise consumer awareness and create action
- Drive PHR (Personal Health Record)/Patient Portal use
- Leverage consumer awareness to influence the system and drive change
- Top management must drive quality and be visible
- Foster bottom-up quality changes
- Include vendors in team meetings

Provider

- Incentive programs (e.g., meaningful use and e-prescribing)
- Payer credentialing programs (e.g., Medicare Provider Quality Reporting System (PQRS), or pay-for-performance quality measures by commercial insurers)
- Certification, recognition, or accreditation programs (e.g., patient-centered medical home recognition)
- Professional recognition

Payment

Practices often underestimate the cost of practice change. Analyses by researchers has revealed that changing to a patient-centered medical home (PCMH) model may cost $117,000 per physician per year, but others have suggested this cost may be significantly higher.[26] Compounding these high costs is the reality that 41% of the primary care workload (arranging referrals, patient communication, emotional support and encouragement, etc.) is not reimbursed by a procedure/examination oriented fee-for-service methodology.[27]

Today's reimbursement initiatives use combinations of four basic reimbursement elements: fee-for-service payments with new service codes (for example, e-visits); care management fees; bonus payments for meeting certain criteria (for example, NCQA certification); and quality or performance incentives. By far the most common approach is a traditional fee-for-service payment and additional payment for meeting certain quality metrics. Research on PCMH implementation funding indicates a high dependence on fee-for-service payments, care management fees, bonus payments from achieving certain criteria (for example, NCQA certification), and quality or performance incentives.[28] Little information on financial models for PCMH in independent fee-for-service primary care practices was found.[29]

Pedagogy

The goal of the Office of the National Coordinator's Health IT Workforce Development Program was to train a workforce to help providers implement EHRs and achieve Meaningful Use. The funded educational programs provided training for the following professional roles: practice workflow and information management redesign specialists, clinician consultants, implementation support specialists and managers, technical/software support workers, and staff trainers.[30]

Practices are seeking training for both clinical and non-clinical staff to enable and empower them in navigating the changing healthcare environment. Training topics of interest to practices include:

- Leadership and teamwork
- Organizational change management
- Workflow and process redesign
- Project management
- Quality improvement and data management
- Better understanding of healthcare reform, ACOs
- Basic strategies for quality improvement
- Understanding of payment reform programs
- Safety science and end user safety
- How EHR systems and portable systems work together
- Assessing needs and communicating needs to vendors

Health IT vendors acknowledge that their clients (clinicians and their staff) need to be provided with adequate training to effectively support a diverse workforce using EHR systems. Like other training, it can be performed in a typical classroom setting, by use of training manuals, and by distance education resources such as WebEx (pre implementation with de-identified or test data). Following implementation, training can also occur in the clinical settings using real patient data in a team-based learning environment. Provisions for free online training on health IT such as massive open online courses (MOOC's) will assist in reaching and providing availability to this education. With respect to incumbent workers, no matter the setting or format for training, it should occur over time to help the staff effectively build their usage of the systems and adequately modify their workflow. The training should be relevant to the task at hand and available in short training modules, thereby allowing staff in a busy practice avail of training as time permits.

Workforce training will continue to increase in importance as healthcare systems strive to reduce readmissions and leverage HIE's, Encounter Notification Systems, and

DIRECT secure messaging. In particular, the role of the health navigator, or an individual who coordinates patient care in the home by doing medical reconciliation, vital capture, and other such tasks. These individuals will need to be trained in health information technology used in the field so that they are better able to engage patients and participate in team-based care.

A clear gap in the delivery of health IT education is the deficiency of graduate level education in applied healthcare informatics however, earlier introductions at the K-12 level will start to build career awareness and allow students to develop a career trajectory at an earlier age. Contributing to this gap is the lack of widespread communication and coordination of the health IT field and the educational opportunities that feed it. In addition to academic preparation with a terminal degree, training for certifications is a plausible method of building the workforce and ensuring they have the appropriate education for their particular role.

Implications

Keeping providers and patients “wired” in a collaborative healthcare delivery environment is the future of healthcare. The development, communication, availability (cost) and execution of Health IT education services will remain a key factor in the success of PCTBC implementation and improvement in patient outcomes. Without rapidly growing education programs and placement into practices, PCTBC may stall amidst the lack of trained and qualified workforce to support a health IT driven healthcare system.

Transformation of the incumbent workforce will in part be a function of learning new technologies and workflows, although the bigger challenge will be infusing a culture of collaborative decision making into the health care environment. The long standing healthcare model in the U.S. has been one of paternal/authoritative decision maker. The PCTBC breaks traditional healthcare model and moves into a shared care decision making process where everyone is an equal contributor. Behavioral change is difficult compared to learning a new piece of equipment; training/education to assist in team based care staff role transformations must be included in all programs, at all professional levels.

Filling the education gaps with content will be easy compared to acquisition of the funding necessary to deliver the training. In-house training may or may not be budgeted into the practice's transformation program and additional assistance may be needed from alternative training providers. Outside academic settings will need to continue to seek government and private party funding to get their programs up and running.

Controlling healthcare costs will vary as a function of how physicians are reimbursed. The fee-for-service model is being eliminated forcing a need for new physician payment models. These models should address the collaborative workflows inherent in PCTB, for example the payment for management only services (e.g. follow-up with family members).

Conclusion

A "big picture" view of the patients experience within the health care system is needed to acknowledge that every action, whether carried out by a clinician or non-clinician worker, no matter how large or small, impacts the patient in some way. Therefore in PCTBC, the goal is to tie everyone into a coordinated operation with the patient in the center.

Patient centeredness is complex with human dynamics at play with every interaction between providers and patient. These interactions, and interpersonal expectations, must transform from the traditional view of paternalistic care taker to health care associates.

While the provider remains the expert opinion in the delivery of care, the patient and family play a much larger role in the decision making process. Therefore, there is a current and pressing need for professional development of the incumbent healthcare workforce whether clinical or non-clinical to be reoriented to this new paradigm.

New and incumbent workers need a core curriculum that reflects this model of care. Soft skills are now more highly valued as interpersonal interactions among health care staff and in decision making with patients become more frequent. As a result, Health IT

Workforce training needs to be a comprehensive package which combines healthcare knowledge, with technical information technology skills and change management methodologies to assist in the healthcare service provider's quest in delivering patient-centered, team-based care.

Appendix A
Panel Member Biographies

M. Turan Ayvaz, M.S., MBA, Ed.D. American National Standards Institute (ANSI)

Mr. M. Turan Ayvaz is the Program Manager of the Certificate Accreditation Program (ANSI-CAP) at the American National Standards Institute (ANSI). His primary focus areas include administering accreditation process, managing client relationship, and providing subject matter expertise to all involved parties. Prior to joining ANSI, Mr. Ayvaz was with Macro International, a government consulting firm, where he provided program evaluation and workforce development support to several U.S. Federal agencies. He was also a research fellow at the George Washington University's Center for the Study of Learning, conducting research and consulting project on organization and leadership development. Mr. Ayvaz has also extensive experience in quality management field, such as ISO 9001 certification. He has a B.S. in Labor Economics and Industrial Relations from Marmara University, Istanbul, an M.S. in Organization and Business Policy from University of Istanbul, and an MBA from Illinois Institute of Technology, and an Ed.D. in Human and Organizational Learning from the George Washington University.

Patricia Dombrowski, Bellevue College

Ms. Dombrowski, director of the Bellevue College Life Science Informatics Center and the ONC-funded 10-state Community College Consortia to Educate Information Technology Professionals in Health Care, was the recipient of the Spirit of HIMSS Award in 2012. Formerly a principal in a software and a telecommunications company, Ms. Dombrowski has served as vice president of marketing and vice president of operations in technology intensive environments. On staff at Bellevue College for the past ten years, she has administered millions of dollars of awards from a wide variety of funders.

Luigi Leblanc, MPH, Zane Networks

Mr. Leblanc is VP of Technology and co-owner of Zane Networks LLC (ZaneNet), an SBA 8(a) and Maryland Minority Business Enterprise (MBE) certified woman-owned small business that assists organizations and groups to adopt emerging technology tools. Since 2000, Mr. Leblanc has guided health IT projects for federal, state and local governmental agencies and for the private sector. When ZaneNet Connect, the company's health IT subsidiary, became a Maryland Managed Service Organization (MSO), he steered it to EHNAC accreditation. He has trained health professionals on the use of tele-health technology for research and business improvement, participated in product development initiatives and provided international telemedicine consulting services. Since 2012, Mr. Leblanc has directed ZaneNet Connect in assisting over 140 primary care providers in Maryland to implement certified electronic health records. He currently serves as the Director of Technology for the Capital Clinical Integrated Network (CCIN) a CMS Innovation initiative that seeks to implement a Medicaid ACO and care management service in the District of Columbia.

Robert Ligon, M.S., University of Texas-Austin

Mr. Ligon is a currently a lecturer in the Health Informatics Program at the University of Texas-Austin where he teaches Healthcare Policy, health information technology, Meaningful Use, Workflow and Process redesign, project management and quality improvement. Prior to joining the faculty at UT he was the Director for Healthcare Information Technology for TMF Health Quality Institute, the designated quality improvement organization for Texas. There he provided leadership and day to day operational direction to the team dedicated to physician EHR use and implementation. As part of the DOQIT project Mr. Ligon participated in helping over 800 physicians in Texas adopt EHR technology. Mr. Ligon completed his undergraduate studies at the University of Houston with a degree in psychology and communications. He completed his Master's degree in Psychology from the University of Missouri-Kansas City. He also has degree in advanced respiratory care. Prior to his work with TMF, Mr. Ligon was the director of cardiovascular research and informatics at a major Midwestern hospital facility and served for ten years as the chief information officer for one of the largest cardiovascular practices in the United States. Mr. Ligon has authored or coauthored

over 60 manuscripts for peer-reviewed journals. He continues to give talks nationally on EHR adoption and implementation and workflow and process redesign.

Edwin A. Lomotan, MD, FAAP-ED, Health Resources and Services Administration

Dr. Lomotan, MD, FAAP – is a pediatrician and informatician at the Health Resources and Services Administration (HRSA) in the U.S. Department of Health and Human Services. He is Chief of the Health IT Branch, a branch within the Office of Quality and Data in the Bureau of Primary Health Care at HRSA. Through grant programs such as the Health Center-Controlled Networks, the Health IT Branch aims to enable the use of health IT for improved health care quality at community health centers across the country. Prior to joining HRSA, Dr. Lomotan was a Medical Officer at the Agency for Healthcare Research and Quality where he focused on the informatics aspects of the CHIPRA Pediatric Quality Measures Program. He received his medical degree from the University of Pittsburgh, completed his pediatrics residency and informatics fellowship at Yale University, and spent several years in a community pediatric practice before joining the Federal government in 2008.

John F. Loomis, Fairfax Family Practice Centers

Mr. Loomis is the Data & Applications Architect at Fairfax Family Practice Centers. Mr. Loomis divides his time between EHR support, software development and informatics research. His specific research interests focus on the study of clinical decision support tools and the interoperability of healthcare information systems. This interest led Mr. Loomis to the development of multiple clinical decision support aids and interfaces that promote coordination between clinicians and patients. Mr. Loomis conducts his research with members of the VCU Department of Family Medicine's multidisciplinary research team and his studies are conducted in the Department's practice-based research network (the Virginia Ambulatory Care Outcomes Research Network). The network is a collection of almost a hundred primary care practices across the state, spanning five health systems, and representing the full spectrum of primary care practice structure and culture.

Susan B. Smith, PhD(c), RN, NE-BC, Fairfax Family Practice Centers

Dr. Smith is currently working as the Director of Quality Improvement and Care Coordination Services at Fairfax Family Practice Centers supporting 12 primary care offices; 100+ physicians, 22 mid-level providers in the Northern Virginia which has achieved NCQA Level III designation Medical Home Model. Susan has worked over a 23 year period at Inovap Health System in various leadership roles; Director of Cardiology (CCU, PCCU, Cardiac Cath & EP Labs), Director of Accreditation and Performance Improvement, Director of Recruitment. Other positions included Director of Staff Development and Planetree National Consultant (Patient Centered Care) At Fauquier Health responsible for the overall competency of staff within the hospital setting and developed leadership core curriculum with e-succession competencies. Achieved designation status in creating a relationship based philosophy, patient centered care culture organization

Roy A. Swift, M.S., Ph.D. American National Standards Institute (ANSI)

Dr. Swift is the Senior Program Director of the Personnel Credentialing Accreditation Programs at the American National Standards Institute (ANSI). In his current role, he oversees all aspects of the Program to include business development efforts, stakeholder management, and organizational partnerships. From 1993-1998 he served as the executive director of the National Board for Certification in Occupational Therapy (NBCOT). The appointment followed a 28 year career in the United States Army Medical Department, where he served as the Chief of the Army Medical Specialist Corps Mr. Swift is not only a successful executive, he is also a sought-after keynote speaker on establishing credentialing conformity assessment systems. He has advised numerous U.S. government agencies and international organizations in the areas of accreditation, certification, and market value of credentialing and effect on job readiness. He is also the chairman of the International Accreditation Forum (IAF) focusing on ISO/IEC 17024, the internationally accepted standard for assessing personnel certification programs. He holds a B.S. degree in Occupational Therapy from the University of Kansas, an M.S. from the University of Southern California, and a Ph.D. in Continuing and Vocational Education from the University of Wisconsin-Madison.

Elizabeth Royal, M.S. Service Employees International Union

Elizabeth Royal is a Senior Coordinator for Health Care Policy at the Service Employees International Union. She has been with the Union for 9 years and has focused on health care reform implementation and long term care system reform. She has provided policy support for a number home care worker union organizing campaigns. Prior to this, she received a Masters in Sociology from Vanderbilt University where she focused on low wage women in the labor market and received a BA in sociology from the College of William and Mary.

Julie Schilz, BSN, MBA, WellPoint

Ms. Schilz is the Director, Care Delivery Transformation at WellPoint. She serves as Executive Committee Liaison to the Patient-Centered Primary Care Collaborative (PCPCC), and in this role works in partnership with PCPCC's board, stakeholder centers and executive committee to enhance communication and help guide PCPCC's strategic direction. Ms. Schilz is on the Editorial Board for Medical Home News. She is also on the Advisory Board for the NCQA 2014 recognition program development. Julie is an Executive Board Member for ClinicNet, a nonprofit organization that serves as a centralized voice for Community-Funded Safety Net Clinics. Ms. Schilz received her formal clinical training as a Registered Nurse at the University of Nebraska Medical Center in Omaha, Nebraska. Her business degree is from Regis University in Denver, Colorado. Her experience collaborating with healthcare organizations and industry stakeholders drives her expertise in care management, quality office system redesign programs, value based reimbursement programs and critical knowledge of Patient Centered Medical Home (PCMH), Accountable Care Organizations (ACO) and Health Information Technology (HIT).

Norma Morganti, Cuyahoga Community College

Ms. Morganti is the Executive Director of the Midwest Community College Health Information Technology Consortium grant, led by Cuyahoga Community College. She is

responsible for the oversight of 17 member colleges across 10 Midwestern states. The grant, sponsored by the Department of Health and Human Services' Office of the National Coordinator, supports workforce development to aid in electronic health record implementation. Prior to joining Cuyahoga Community College, also known as Tri-C, Ms. Morganti worked in administration within secondary education for 12 years where she led educational and technological enterprises. During her time as the Chief Technology Officer, she spearheaded initiatives to enhance online learning environments, technologically-enhanced classrooms, and improved individualized student learning measures. Ms. Morganti received a BS degree in Organizational Administration and Personnel Management from Miami University in Oxford, Ohio.

David Wellons

David Wellons joined MDdatacor in 2012 as vice president of sales. He has 25 years of experience working with the sales, marketing and operations activities of IT and communications companies that serve the healthcare industry. He has a strong background in the payor and provider markets, both selling as well as leading sales and marketing teams. His experience includes EMR/EHR and PHR, practice management and billing, quality and utilization management, case and disease management, bio-banking and data collection systems, health information exchange (HIE), and patient-centered medical home (PCMH) solutions that bring medical data to the point of service while improving patient care and reducing costs. His healthcare IT experience was gained in both large and small companies, including Baxter, Landacorp, BCA and MEDecision. As director of health care solutions for BellSouth, David participated in the national design of specifications and legislation for the development of the RHIO/NHIN network concepts, and the application of telecommunications services to the improvement of healthcare. He has been awarded seven U.S. patents for communications-based healthcare networks. He was appointed by the governor of North Carolina to represent BellSouth as a board member of the North Carolina Healthcare Information and Communications Alliance. He has held position he held for nine years.

Appendix B
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These references are those provided by the panel members.

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