West Virginia
Health Information Technology Statewide Strategic Plan

September 2009

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Developed by the West Virginia Health Improvement Institute
Final Draft *Last Revised 9/3/2009 Version 26.0*

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Dear West Virginians,

The health and well -being of all West Virginians is a priority for the state. The health and burden of illness in our community affects all aspects of our lives. Health affects our productivity that in turn influences our tax base. Health drives the health care costs that the state has to incur. Most important, health affects you and your quality of life.

Unfortunately, West Virginia continues to rank in the bottom ten states in the nation in overall health status of its population. We know how to deliver and improve health care. In West Virginia, some of our doctors and hospitals rank in the top 1% nationally. The rise in Diabetes is one of our major concerns across our citizens. One in three people are at risk for Diabetes in West Virginia. The science exists for how to prevent Diabetes. If we have good doctors and hospitals why can't we bridge this gap between what we know and what we do? One of the primary reasons is the management of health information and communication.

Think about your most recent visit to your doctor or hospital. You were asked to show proof of your health insurance coverage, and asked a series of questions about your family medical history; medications and allergies; your emergency contact information; and asked to verify your address and phone number. How many times have you been asked the same information? What happens if you are in another part of the state and need urgent care? Is that same information available for the care team to help streamline your visit? Have you ever had a medical test and the results are not available when you next need care and you have to have the test repeated? Why are there so many medication errors in health care?

The common thread behind these questions and issues is how our health care system manages and communicates information. This document sets forth a vision for bridging this gap. We intend to leap forward as a state from our bottom ten status to being a top- tier state in terms of health of its population. By aligning resources and the hard work of all those supporting health care in West Virginia we can bridge this gap. As we connect professionals, families and communities, and work together to improve the health status of all West Virginians we should all benefit from the rewards from a high quality of life. Join us on this voyage and play your role in helping us become the healthiest state in the nation because we are the health information technology state.

Sincerely yours,

Martha Y. Walker

Interim GOHELP Director

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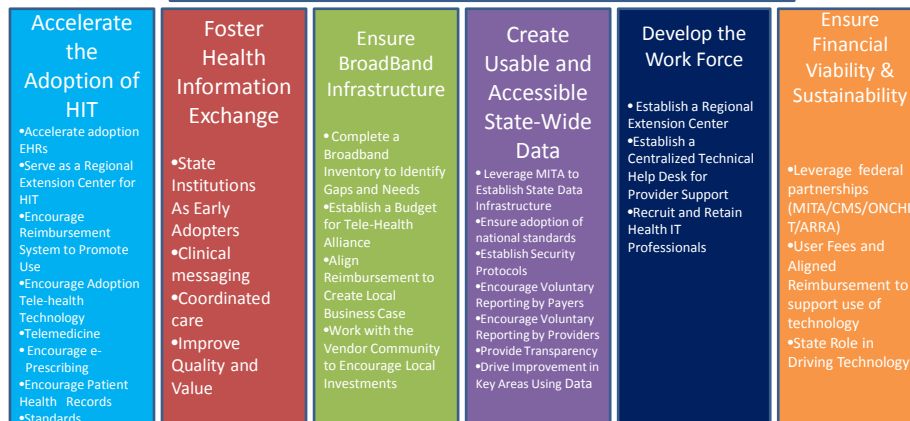Final Draft *Last Revised 9/3/2009 Version 26.0*

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Executive Summary

This strategic plan sets forth a vision for the state of West Virginia relative to health information technology. The plan was developed by a work group of stakeholders from the health care system. The plan is being circulated for wide comment and feedback. Comments will be incorporated with the final plan.

A summary of the plan is presented below:

West Virginia State Health Information Technology Strategic Plan

Vision: **The vision** for the health information system strategic plan is to ensure a coordinated information technology infrastructure and delivery system is established that allows patients, families, communities and the health care system to collaboratively partner to improve the health and well being of all West Virginians.

Accelerate the Adoption of HIT	Foster Health Information Exchange	Ensure BroadBand Infrastructure	Create Usable and Accessible State-Wide Data	Develop the Work Force	Ensure Financial Viability & Sustainability
•Accelerate adoption EHRs •Serve as a Regional Extension Center for HIT •Encourage Reimbursement System to Promote Use •Encourage Adoption Tele-health Technology •Telemedicine •Encourage e-Prescribing •Encourage Patient Health Records •Standards	•State Institutions As Early Adopters •Clinical messaging •Coordinated care •Improve Quality and Value	•Complete a Broadband Inventory to Identify Gaps and Needs •Establish a Budget for Tele-Health Alliance •Align Reimbursement to Create Local Business Case •Work with the Vendor Community to Encourage Local Investments	•Leverage MITA to Establish State Data Infrastructure •Ensure adoption of national standards •Establish Security Protocols •Encourage Voluntary Reporting by Payers •Encourage Voluntary Reporting by Providers •Provide Transparency •Drive Improvement in Key Areas Using Data	•Establish a Regional Extension Center •Establish a Centralized Technical Help Desk for Provider Support •Recruit and Retain Health IT Professionals	•Leverage federal partnerships (MITA/CMS/ONCHIT/ARRA) •User Fees and Aligned Reimbursement to support use of technology •State Role in Driving Technology

The plan provides insight into the plethora of activities in West Virginia that have focused on health information technology. In many areas, the state has been a leader and early adopter of use of health information technology. Also in many areas, the state faces substantial challenges overcoming its rural environment and economic forces affecting the health care system. Even more daunting are the health care issues facing the population.

A vision is offered in this plan for West Virginia where health information technology plays a critical role in bridging the gaps to access and quality of service for the purpose of improving the health and well- being of all West Virginians.

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Six core strategic drivers are presented. These include:

- **Accelerating the Adoption of Health Information Technology***:* Six priorities are outlined. All focus on accelerating the adoption of electronic medical records (EMR) and related health information technologies by the provider community. The priorities recognize the need for a well -coordinated effort to ensure that providers are informed purchasers of technology and that their investments translate into meaningful use in daily work.

- **Fostering Health Information Exchange:** In order for the benefits of use of technology to be fully realized there needs to be an efficient, affordable and reliable exchange of information. This plan incorporates the work of the West Virginia Health Information Network, ensuring that a viable and robust exchange supports the flow of information across the health care system.

- **Ensuring Broadband Infrastructure is Available to Support Technology***:* The rural geography of West Virginia, coupled with the population dispersion, presents unusual challenges, ensuring that adequate infrastructure is able to support technology in communities. Four priorities are offered and aimed at encouraging infrastructure investments in the state.

- **Creating Useable and Accessible Statewide Data***:* The adoption of technology allows for strategic use of data for planning and improvement of health care services. Seven priorities are presented and aimed at ensuring that data are readily available for decision support. This includes strategies for encouraging voluntary reporting and transparency of data.

- **Develop the Work Force:** The acceleration of adoption of technology will present challenges to the work force. As a result, four priorities are offered for the purpose of ensuring that the work force is trained and available to support efficient use of technology. This plan also presents a vision where West Virginia plays a role as a national resource for the training of professionals in health information technology.

- **Ensuring Financial Viability and Sustainability:** Finally, the plan recognizes that West Virginia will need strong partners in order to ensure that the financing of this vision, plan and its priorities is viable and sustainable. The plan recognizes that the financing strategies cannot be a burden assumed entirely by any single stakeholder, but will need to be a collaborative effort shared across the health care system.

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Acknowledgements

This strategic plan was developed through a collaborative process engaging stakeholders representing the governmental and non-governmental health care system in West Virginia. The work group that assumed the lead for drafting the first iteration of the plan included:

Pat Miller Bureau for Medical Services	Sallie Milam West Virginia Health Information Network (WVHIN) and Health Care Authority	Jim Comerci, M.D. Private Physician Former Chair, Select D Work Group on HIT
Peter Groen Shepherd University Research Corporation (SURC)	Jack Shaffer Medicaid Transformation Grants Community Health Network of West Virginia	Larry Malone West Virginia Telehealth Alliance
John Wiesendanger West Virginia Medical Institute	Sue Ann Lipinski West Virginia Governor's Office of Technology	Laurel Harris Arnold BDMP
Helen Matheny West Virginia Medical Foundation	Robert Coffield Flaherty, Sensabaugh and Bonasso, LLC Chair Health Improvement Institute HIT Work Group	Roger Chaufournier West Virginia Health Improvement Institute

Contributors to the Development of the Strategic Plan Included:

Governor's Office of Information Technology	West Virginia State Medical Association	Shepherd University
Department of Health and Human Resources	West Virginia Medical Foundation	West Virginia University
Bureau for Medical Services	West Virginia Academy of Family Practice	Marshall University
West Virginia Health Care Authority	West Virginia Academy of Pediatrics	West Virginia School of Osteopathic Medicine
West Virginia Health Information Network	West Virginia Hospital Association	Mountain State Blue Cross and Blue Shield
West Virginia Telehealth Alliance	West Virginians for Affordable Health Care	Public Employees Insurance Agency
West Virginia Medical Institute		

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Vision for West Virginia Health Information Technology

Purpose of this Strategic Plan:

This strategic plan was developed in the context of Governor Manchin's Healthy West Virginia (HealthyWV) Strategic Plan completed and published in April 2007. This plan sets forth the priorities for the state and is intended to play a role in ensuring alignment of health information technology initiatives in the State of West Virginia.

The Governor's HealthyWV Plan: Principles, Goals and Objectives:

According to the Governor's HealthyWV Strategic Plan, to start West Virginia on our path to a healthier future, this administration will be guided by the following *principles*:

- The ultimate purpose of West Virginia's health system should be to ensure the best possible health outcomes for all West Virginians. *Physical* and *mental health* are essential components of overall health and well -being.
- *Prevention* and *health promotion* must be cornerstones of West Virginia's health policy.
- All West Virginians should be informed and active partners in taking care of their own health, making wise use of health care resources, and contributing financially to their health care to the extent that they are able – and all should have the opportunity to obtain the *information* they need to do so.
- All West Virginians should have the opportunity to obtain health care that is *affordable*.
- The health care system must provide care of the highest value and *efficiency* for the resources allocated.
- Responsible use of government funds to ensure high-quality, affordable health care requires a *partnership* between the private sector and government.
- The overall *costs* of the health system must be sustainable over time for individuals, families, government, and employers.

It is critical to emphasize that health information technology is an enabler for the provision of high- quality health care services. It also can be a critical resource to enable citizens, as health consumers, to better self-activate in the management of their health needs. The vision and priorities set forth in this plan are all conceived with the ultimate aim of improving the health and well- being of the citizens of West Virginia.

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Vision

The Vision for Health Information Technology in West Virginia:

The vision *for the health information system strategic plan is to ensure that a coordinated information technology infrastructure and delivery system is established that allows patients, families, communities and the health care system to collaboratively partner to improve the health and well- being of all West Virginians.*

The Ten Year Goals

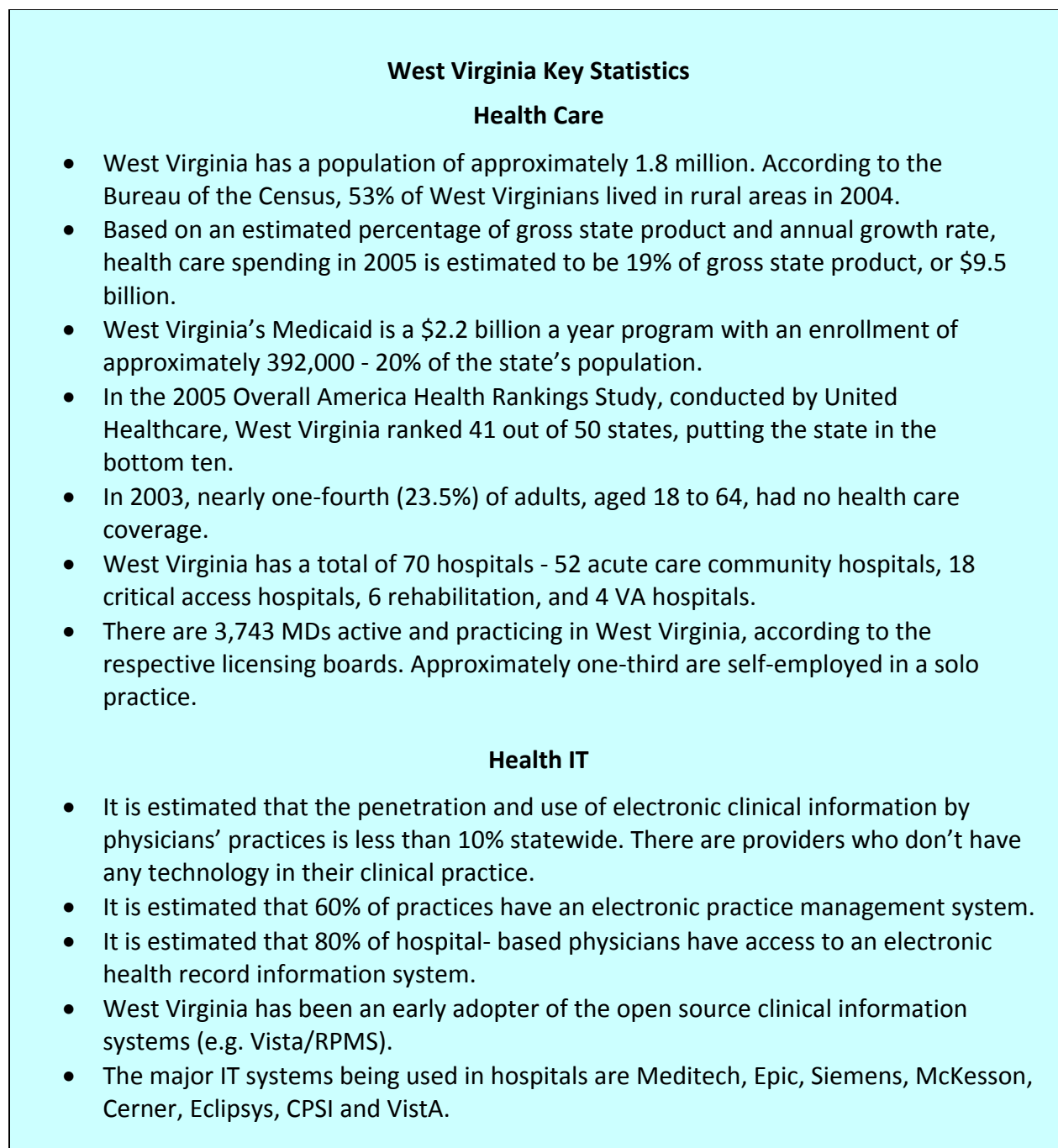The goals for the strategic plan include:

- 80% of physicians in the state will be using Electronic Medical Record health information technology for clinical support in daily work by 2016, exceeding the federal guidance and intent associated with meaningful use.
- 100% of our hospitals will be using Electronic Medical Record systems and related technology by 2015 in a meaningful way, and will be interconnected throughout the state to ensure that critical health information is readily accessible and communicated.
- A functioning statewide health information exchange (i.e. WVHIN) will roll out statewide over a four-year period, moving from community to community, with a goal of achieving statewide implementation by the end of 2014.
- Statewide health information technology architecture and associated standards will be in place allowing for secure access by patients and providers to electronic medical records via a high speed clinical data exchange. Broadband and Telehealth technologies will be available to patients and providers allowing for cost effective, ready access to resources for clinical management of chronic disease, and for facilitating high -quality acute care services and support.
- Consumers will have access to their health information electronically, and will be able to exercise control over the parties that can view that information; for education resources that builds self-activation capacity to maintain healthier lifestyles; and will be connected to health care providers working collaboratively to im*p*rove their care.
- All stakeholders (e.g. hospitals; clinics; physician offices; ancillary services) will understand and engage in a common standard of exchange and flow of clinical information.
- Consumers and providers will be connected using selected technologies to assist with addressing core chronic disease, health and wellness needs (e.g. personal health records; remote Telehealth monitoring).

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- The state of West Virginia will be developing and refining policies/criteria/procedures, consistent with Federal mandates, providing for the securing and sharing of data that leads to improved clinical processes and comparatively better outcomes utilizing certified health information technology. Our priorities will be focused on: improving quality, safety, efficiency, and reducing health disparities; engaging patients and families; improving care coordination; improving population and public health; and ensuring adequate privacy and security protections for personal health information.

- The state of West Virginia Bureau for Medicaid Services will develop automated systems to collect, measure, and reimburse meaningful use data in accordance with Federal law and CMS requirements.

- 80% of all lab tests will be ordered and delivered electronically by the WV State Lab and Office of Maternal and Child Health.

- 100% of immunization records will be transferred into the WV State Immunization Registry by way of EMR interfaces.

- The state of West Virginia will develop and maintain a MITA plan.

- The improved telecommunications infrastructure resulting from this plan will enable new Telehealth applications, such as Telestroke and Telecardiology initiatives, as well as advanced life support for trauma cases through integration with the state's Medical Command infrastructure.

- West Virginia will become recognized as the health information technology state and a national resource for professionals and consumers trained and skilled in the use of technology to support healthy lifestyles and quality health care delivery.

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Environment and Situational Context

West Virginia is a rural state facing numerous challenges in terms of the overall health status of the population. Figure 1 provides a summary of key statistics for West Virginia.

Figure 1. Overview of *the* state of West Virginia Key Statistics

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West Virginia Key Statistics

Health Care

- West Virginia has a population of approximately 1.8 million. According to the Bureau of the Census, 53% of West Virginians lived in rural areas in 2004.
- Based on an estimated percentage of gross state product and annual growth rate, health care spending in 2005 is estimated to be 19% of gross state product, or $9.5 billion.
- West Virginia's Medicaid is a $2.2 billion a year program with an enrollment of approximately 392,000 - 20% of the state's population.
- In the 2005 Overall America Health Rankings Study, conducted by United Healthcare, West Virginia ranked 41 out of 50 states, putting the state in the bottom ten.
- In 2003, nearly one-fourth (23.5%) of adults, aged 18 to 64, had no health care coverage.
- West Virginia has a total of 70 hospitals - 52 acute care community hospitals, 18 critical access hospitals, 6 rehabilitation, and 4 VA hospitals.
- There are 3,743 MDs active and practicing in West Virginia, according to the respective licensing boards. Approximately one-third are self-employed in a solo practice.

Health IT

- It is estimated that the penetration and use of electronic clinical information by physicians' practices is less than 10% statewide. There are providers who don't have any technology in their clinical practice.
- It is estimated that 60% of practices have an electronic practice management system.
- It is estimated that 80% of hospital- based physicians have access to an electronic health record information system.
- West Virginia has been an early adopter of the open source clinical information systems (e.g. Vista/RPMS).
- The major IT systems being used in hospitals are Meditech, Epic, Siemens, McKesson, Cerner, Eclipsys, CPSI and VistA.

The challenges faced by the state have in part been responsible for West Virginia being an early entrant into the health information technology arena. Numerous initiatives have been launched throughout the state to address health information technology. These initiatives are summarized in Figure 2.

Figure 2. Initiatives Launched in West Virginia to Address Health Information Technology

HealthyWV – Key Health Information Technology (HIT) Accomplishments and Initiatives 2005-Present

West Virginia is a Leader on the National eHealth Stage:

- The Community Health Network of West Virginia was a HRSA Integrated Services Delivery Network grantee for the purpose of adapting the VistA-RPMS electronic *health record system* (EHR) in a non-federal primary care environment.
- The West Virginia Telehealth Alliance is one of 69 organizations across the U.S. that is participating in the FCC's Rural Health Care Pilot Program. As such, the WVTA will have approximately $9.7 million in state and federal funds to improve broadband connectivity among eligible health care entities in the state.
- The state received five Transformation Grants from the Centers for Medicaid and Medicare Services (CMS), which represents the largest award given, which focused on addressing health information technology needs of the State Medicaid Program.
- The West Virginia Medical Institute has been participating in a national effort entitled Health Information Security and Privacy Collaborative (HISPC). WVMI and WVHIN were designated by Governor Joe Manchin in 2006 to participate in this multi-state collaborative to address the privacy and security concerns with EHR/HIT.
- West Virginia has participated in the National Governor's Association e-Health Alliance that is an initiative designed to improve the nation's health care system through the formation of a collaborative body that enables states to increase the efficiency and effectiveness of the health information technology (HIT) initiatives they develop.
- West Virginia participates in the National Committee on Vital and Health Statistics that serves as the statutory public advisory body to the Secretary of Health and Human Services in the areas of population health, privacy, security, quality, standards, electronic health records, personal health records, health information exchange and the Nationwide Health Information Network.
- The West Virginia Health Information Network is a Nationwide Health Information Network contractor and is helping, for the second year, to build this network. This contract is valued at $3,365,822.

West Virginia is committed to HIT:

- State Bill 170 established the West Virginia Health Information Exchange Network to encourage electronic transactions in the health care system. The *West Virginia Health Information Network (WVHIN)* initiative is underway to design a statewide, interoperable health information technology network within five years. The organization is mature, a business plan for sustainability in late development, and a roadmap proposed for roll-out of the execution of the exchange infrastructure.
- West Virginia Medical Institute (WVMI) is a national resource in the HIT field providing quality management and improvement and HI**T** ser*vices. WVMI has top security clearance for CMS,* DOD and the Veterans Affairs Administration. In their role they have developed technical resources for the provider community in accordance with its 8th Scope of Work with CMS. As part of that effort WVMI launched an *e-Health Initiative* focused on engaging the provider community in strategies to accelerate the adoption of health information technology throughout the state of West Virginia as well as the states of Delaware and Pennsylvania.
- DHHR is implementing a new *Medicaid Management Information System (MMIS)* that will more efficiently facilitate the submission and processing of claims, making it easier to detect fraud and abuse.
- Steps to improve health IT were taken by the Bureau for Behavioral Health & Health Facilities to implement the U.S. Department of Veterans Affairs (VA) VistA *electronic health record (EHR) system* in all seven state-owned and operated health care facilities.
- West Virginia Health Care Authority is developing the *CompareCare West Virginia* website to help consumers make better decisions about where to seek health care.
- DHHR is launching an eHealth portal throughout the state by working to implement *e-Prescribing* in West Virginia.
- West Virginia is working on a number of other health IT initiatives aimed at improving e*mergency preparedness, disaster management, disease management* and *health promotion.*
- The administration is also considering ways to boost West Virginia's *health care workforce,* and increase the number of *good jobs* available to West Virginians.
- The Health Plan of the Upper Ohio Valley deployed $500,000 in resources, available to physician practices, to assist with the adoption of health information technology.
- The Select D Sub Committee of the State Legislature launched in 2009 a comprehensive strategy to establish health reform through Senate Bill 414. A variety of initiatives, including health information technology; administrative simplification, and chronic care management were the focus. That effort resulted in the establishment of a new office entitled Governor's Office of Health Enhancement and Lifestyle Planning (GOHELP).
- Shepherd University has launched a Center for Health Information Technology and the State University Research Consortium (SURC), focusing on building the state capacity for health information technology services and research opportunities.

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- Hospitals and health systems throughout the state have been early adopters in promoting and exploring support for adoption of electronic health record technology, including the use of open source solutions.
- Health-*E* West Virginia provided electronic health solutions to safety net providers and community health centers (CHC).
- The West Virginia Emergency Medical Command has been established and explored the role of health information technology in supporting emergency response.
- The West Virginia Department of Corrections and the West Virginia Regional Jail and Correctional Facility Authority have an initiative to acquire electronic health records.
- The National Technology Transfer Center has funded an initiative in Wheeling called HealtheWV.
- PEIA and DHHR have been pursuing the application of the Microsoft HealthVault for personal health records.
- The West Virginia Medical Foundation was awarded a $186,500 two-year grant by the Physicians' Foundation for Health Systems Excellence to aid West Virginia physicians in the adoption of health information technology. Specifically, the Foundation conducted a needs assessment, produced a special issue of the *West Virginia Medical Journal*, hosted a two-day conference, and developed a website resource section including on-line continuing medical education.
- The West Virginia Medical Foundation staff created and implemented a needs assessment survey during the first quarter of 2007 to determine where West Virginia physicians are in the process of implementing health information technology, and to identify programs and services that should be developed to assist physicians as they implement this technology.
- The West Virginia Medical Foundation facilitated the production of a special issue of the *West Virginia Medical Journal* that was published during the first quarter of 2007 to provide a comprehensive update related to health information technology in West Virginia.
- West Virginia physicians, office managers and medical group managers gained practical information at a two-day CME-eligible conference titled "Improving Patient Care with Health Information Technology" June 15-16, 2007 at the Waterfront Place Hotel in Morgantown. The conference was co-sponsored by the West Virginia Medical Foundation and the West Virginia University School of Medicine's Office of Continuing Education. The focus of the conference was to provide physicians with the opportunity to share their experiences in selecting and implementing health information technology into their practices. A health information technology resource section has been added to the website wvsma.com/foundation. The site includes 7 hours of on-line CME modules titled "Improving Patient Care with Health Information Technology." Journal articles, links to helpful websites and a glossary of health information technology terms also are included on the site.

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Benefits of HIT

The benefits of using health information technology and exchanging information across the health care system are substantial and tied to a fundamental business case. The classic core benefits of health information technology include:

- **E-prescribing and Patient Safety:** The Institute of Medicine estimates that 44,000 to 98,000 deaths each year result from preventable medical errors in hospitals, and other estimates indicated that the number could be closer to 300,000. Each year, hundreds of thousands of preventable adverse drug events also occur. This hasn't yet been translated into dollar savings. Functions commonly found in EHR systems today include allergy checking, drug-interaction checking, medical alerts, access to additional patient data maintained by other health care organizations, and many other features paper-based patient records are not capable of providing. Automated prescription systems allow for rapid identification of contraindicated medications that might result in harm. In addition, through automation formularies can be better maintained, highlighting lower cost alternatives. It is important to emphasize that for the benefits of e-prescribing to be fully realized there must be interconnectivity across the health care system (so data for patients seeking drugs from one pharmacy can automatically be merged with drugs from another pharmacy). It is these features of electronic medical record (EMR) systems that significantly contribute to patient safety and better quality of care that provide the real justification for acquiring and implementing these systems.

- **Decision Support Influencing Appropriate Utilization and Quality of Health Care Services:** Automated health information systems (registries and EHRs) allow for the latest evidence base to be built into the logic of the system providing reminders and prompts to the care team at the point of service. As a result, it is possible to close the gap between the percentages of patients getting the care they need, according to the evidence base, (cited by McGlyn/Rand at less than 50% of the time) to high levels of performance (in excess of 80% of patients). Decision support at the point of service results in fewer unnecessary referrals to subspecialists and by improved patient tracking, fewer visits to the emergency room and hospitalization. The HIT must be more than an archival and record keeping system; it must provide the tools for decision support if this benefit is to be realized.

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- **Population Health Management Results in Improved Outcomes and Reduced Cost**: HIT allows for providers to move away from a reactionary system dependent upon when patients seek care to one that is proactive and able to review population level data. It identifies those patients in need of care and pulls them into the care delivery system. This proactive management of the population influences future demand in a positive way, while at the same time avoiding unnecessary utilization by having an impact on ambulatory sensitive conditions. *In order for this benefit to be realized the HIT must be able to produce the population level and care opportunity reports necessary to manage a population. The care team must also be trained to learn how to do the analyses and design their systems to take advantage of the new information*.

- **Referral Tracking:** A major issue in primary care is ensuring that patients have access to and follow-through with referrals within the health care system. This is particularly important in such areas as colorectal screening where early detection can have a major impact on life expectancy and cost to the health care system. *In order for this benefit to be optimally realized there must be interconnectivity across the health care system where information flows readily across the care delivery system.*

- **Coordinated Care and Continuity of Care:** Technology allows for improved decision support at the point of care. Providers who have used patient registry functionality (whether imbedded in an electronic health record or as a stand-alone registry) have demonstrated improvements in quality of care delivered due to the linkage of the latest evidence base to life stages of the patient. The ability to bundle information on the patient's health care needs and share information through health information exchanges allows for better joint decision- making, and can lead to patient empowerment and improved self-activation. Improved coordination of care reduces inappropriate care and redundant testing.

- **Enable Consumers to Take Responsibility For Their Care:** Access to transparent information electronically will lead to better health care choices. Consumers with chronic disease will be able to better self-manage and adjust lifestyles based on access to information.

- **Tele-Health and Broadband Technology:** Technology is playing an increasing role in remote diagnostic, monitoring and care delivery. In particular, Telehealth and broadband technology offers a promise of reducing the constraints imposed by distance and poor infrastructure while improving health and well-being. Home

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monitoring of people with chronic disease enhances patient empowerment while arming the health care team with critical medical surveillance information. Remote diagnostic applications in dermatology, mental health, and ophthalmology are expanding access to care for those in remote and medically underserved areas. Cellular phone technology has also evolved to provide many of the same functional applications available in the home environment.

Telemedicine technologies also will be vital to help to address critical public health challenges in West Virginia's rural areas. According to a 2007 AHRQ study, rural residents are at a health disadvantage:

- Compared with their urban counterparts, rural residents are more likely to be: elderly, poor, in fair or poor health, to have chronic conditions, and to die from heart disease.
- Rural residents are less likely to receive recommended preventive services and report, on average, fewer visits to health care providers.
- Although 20% of Americans live in rural areas, only 9% of physicians in America practice in those areas. There are three times more specialists in urban areas than in rural areas.

Telehealth and telemedicine hold the promise of being able to help improve these issues by delivering specialist care from urban areas to these rural areas in a cost-effective manner. It also will help to reduce travel and transportation costs to-and-from these rural areas for the patients requiring specialty care. And, as many studies have shown, lack of transportation is a major barrier to healthcare access to the rural residents of our state.

The technology also holds the promise of being able to vastly reduce the costs that are going to be faced by our state and our nation as the population continues to age. Over the next 25 years, approximately 78 million "baby boomers" will retire, dramatically changing the demands on both government and private resources. Economic gains from expedited broadband rollout can be a potential solution to alleviate these strains. West Virginia is a microcosm of what the U.S. will look like in the future and is the perfect place to develop and use these technologies. These technologies can also greatly improve the quality of life for an aging population by allowing them to age in-place, instead of being transported and cared for in more expensive facilities.

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The Business Case for Investment in Technology

Douglas Goldstein and Peter Groen (Shepherd University) have extensively studied the benefits and the return-on-investment (ROI) related to the use of the electronic medical record (EMR) systems and related technologies. The following data and business case information are adapted from their book *"Medical Informatics 2020," published* in 2008 by Jones & Bartlett.

EHR Systems*:*
- It is estimated that over five years, EHR benefits will be $86,400 per provider, and the benefits will be accrued by several stakeholders such as, physician practices, ancillary services, pharmacies and most importantly patients.
- Ohio State University Health System reduced the time for getting medication to patients by 65% from 5.28 hours to 1.51 hours. They also reduced Radiology turnaround from 7.37 hours to 4.21 hours.
- Maimonides Medical Center reported 30.4% reduction in average length of stay from 7.26 to 5.05 days. They also realized organizational efficiencies by preventing duplicate ancillary tests.
- Heritage Behavioral Health experienced 70% reduction in cost of clinical documentation with EHR.
- University of Illinois at Chicago Medical Center gained significant benefits in reallocation of nursing time from manual documentation to direct care - estimated to be $1.2 million.

e-Prescriptions:
- Many errors occur because of handwritten prescriptions that can be easily misunderstood resulting in adverse drug events or complications. More than three billion prescriptions are written annually and according to an eHI report, medication errors account for 1 out 131 ambulatory care deaths and many deaths in acute care are also attributed to medication error.
- Studies indicate that the national savings from universal adoption could be as high as $27 billion annually.

Computerized Provider Order Entry (CPOE):
- The Center for Information Technology Leadership (CITL) estimates that implementing advanced ambulatory CPOE systems would eliminate over two million drug events per year; avoid nearly 13 million physician visits, 190,000 admissions, and over 130,000 life-threatening adverse drug events per year and save $44 billion per year.

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- Brigham and Women's Hospital in Boston reported a 55 percent reduction in serious medication errors and a 17 percent reduction in preventable Adverse Drug Events (ADE) - average cost of an ADE was $2,595, resulting in projected savings of $480,000 per year. They estimated net savings from $5 million to $10 million per year.
- Maimonides Medical Center in New York realized a 55 percent decrease in medication discrepancies and a 58 percent reduction in problem medication orders. They also eliminated pharmacy transcription errors.
- Children's Hospital of Pittsburg has eradicated handwriting transcription errors completely and cut harmful medication errors by 75 percent.

Telehealth / Telemedicine:
- National studies indicate that more than 80 percent of the Medicaid budget is devoted to persons living with chronic diseases such as Diabetes, heart disease and respiratory conditions. Agencies that use remote monitoring technologies can provide home care in a more timely and targeted way than scheduled home visits would typically allow. Instead of visiting the patient once a week or once a month (or waiting for the patient to see a provider when chronic conditions dictate acute action), providers can monitor the patient daily and make appropriate real-time interventions in the care of their patients. In West Virginia, if just 600 high-cost members were monitored using this technology there is a potential $21 million annual cost savings to WV Medicaid.[1]
- Roanoke Chowan Community Health Center, a 15 provider rural clinic system serving a population of more than 14,500 patients in an environment similar to West Virginia, has shown substantial cost savings by using Telehealth and remote in-home monitoring. RCCHC saw Telehealth patient ED visits decrease by 73%. Telehealth patient hospitalizations decreased 63%. RCCHC also saw that Telehealth patient charges decreased 81%. It is estimated that the impact of Telehealth on their population is $21 million per year for the 600 patients monitored. [2]

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[1] . *Source: Jack Shaffer, West Virginia*

[2] *Source: Jack Schaffer, West Virginia*

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- In 2002, the Veterans Health Administration produced a detailed technology assessment of remote patient monitoring (RPM) in the management of congestive heart failure (CHF). Rita Kobb and colleagues demonstrated a 60% decrease in hospital admissions, 81% decrease in nursing home admissions, and a 66% decrease in ED visits among 281 RPM-monitored veterans with CHF, in comparison to 1,120 veterans who did not use the technology. Other VHA studies reported similar conclusions, for other diseases and conditions. Similar research did not include direct cost measures, but found remote monitoring for end-of-life care decreased the total combined costs of hospital and ED use over six months for 100 veterans from $151,771 to $25,119.

In summary, the health care literature continues to grow with the evidence base that electronic health information technology can demonstrate a return on investment as a driver of efficiency in the health care system. These studies indicate that 20% to 40% of diagnostic tests are duplicated due to lack of results being readily available and effective use of health information exchange can result in a reduction in laboratory and radiology test ordering by 9% to 14%, lowering ancillary test charges by up to 8%, reducing hospital admissions, costing an average of $17,000 each, by 2% to 3%, and reducing excess medication usage by 11%. Similar studies predict a gain of as much as 30% in efficiency from EHR use and HIE, mostly through reducing unnecessary tests and prescriptions, elimination of paperwork and reduction of medical mistakes. In West Virginia, this amounts to a potential $3 billion savings of total health spending of $10 billion (approximating the total state general revenue budget of $3.629 billion in 2007) and nearly $1 billion for the West Virginia Medicaid program.[3]

The Need for a State-Wide Health Information Technology Strategic Plan

These environmental forces have all played an important role in engaging stakeholders throughout the state in dialogue on the needs of the state, including the issues of health information technology. It became readily apparent that despite efforts to share information and share membership, many initiatives were proceeding with their individual planning efforts in a siloed manner. As a result, many

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[3] Adapted from: http://healthcarereform.wvlegislature.gov/resources.cfm.

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of the work groups operating in the state came together in May 2009, under the auspices of the West Virginia Health Improvement Institute, to consolidate planning efforts and draft a state-wide master plan for health information technology. This document represents the output of that process.

It is important to note that this plan is intended to support the entire health care system including primary care, specialty care, hospitals and health systems, long term care, behavioral and oral health, and ancillary services. The principles and strategic drivers outlined in this plan are intended to ensure that all of these services are optimally interconnected through technology to better serve the citizens of West Virginia.

Accelerating Adoption of Health Information Technology By the Health Care System

A major driver of the state's strategy for health information technology plan is the use of electronic medical records (EMR) and related health information technologies by the health care system. The priorities set forth in this section of the plan focus on tactics to accelerate the adoption of health information technology by medical providers in West Virginia.

Barriers

There are many barriers to adoption, resulting in the fact that the adoption curve of HIT, nationally, is less than 24% of practices having information technology beyond billing and practice management systems. The barriers include:

- **Acquisition Cost**: The cost of technology is a barrier throughout the health care system. As an example, the acquisition cost for a typical practice is estimated at $45,000 per provider (DesRoches NEJM 2009). This includes licensing and software costs, hardware costs, training, and lost productivity during implementation. Additionally, subsequent yearly support costs of about $8,500 per full time equivalent provider are estimated. The cost of a Health Information Exchange is also problematic and health care systems struggle with the capital outlays required to truly automate.
- **Complex Business Models:** A challenge is that despite evidence and projections of savings, the benefits of these investments don't always accrue directly to those being asked to invest in the technology. As an example, medical providers are being challenged to invest in electronic health information technology. Yet, the benefits of such investments often accrue to the broader health care system (e.g. payers, government). Health information exchange benefits many parties throughout the system but linking this to a viable financial business model for on-going sustainability is challenging.

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- **Lost Productivity:** Data entry into EHRs has had an impact on many practices beyond just the initial installation period. The power of data collection triggered by HIT systems has a corollary impact of taking more time of the provider in data entry. Many cite a decrease in clinical productivity for some period of time as a result of the new HIT systems.
- **Learning Curve:** The learning curve is steep for both provider and support staff. This can present daunting challenges to many who are not used to technology or did not grow up as part of the "Nintendo Generation."
- **Training Needs:** Many practices do not have the project management staff or expertise to design the training needs for the care team. As a result, they rely on vendor training that can be function oriented rather than enabling the practice to take advantage of the functionality inherent to the system. There are examples of providers in West Virginia who had an EMR for years, but never used many of the features and never realized the full benefits of the technology. According to a recent survey, just one third of clinics with an EHR implemented actually used the full capabilities of the system.
- **Bandwidth:** Having access to reliable advanced broadband and next-generation wireless services are continous challenges in numerous rural areas. As a result, the full benefits of HIT may not be realized across our state until additional investments (public or private) are made to ensure necessary connectivity levels and dependable, high-quality service offerings
- **Payment Methodologies:** Current payment methodologies reward volume and procedures and not chronic care, primary care, prevention and care coordination. Use of technology can benefit many of these initiatives but absent payment reform there is no incentive for physician practices to change and invest in technology.

Current Penetration

An environmental scan, supported through one of the Medicaid Transformation grants, was conducted in 2008 of the key physician segments in the state of West Virginia. As of January 2009 the following estimates demonstrate the level of penetration:

Hospitals and Health Systems	Estimated at 75% penetration
FQHC and Community Health Centers	Estimated at 35% for all clinics, but County Health Departments had less than 5%
Large Group Practices and Academic Health Centers	Estimated at 45%
Private Practices (majority of physicians)	Estimated at 15% for all practices, and fewer than 10% for rural practices

Source: Shepherd University Research Corporation (SURC)[4]

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[4] Data obtained in support of a Medicaid Transformation Grant funded by the Centers for Medicare and Medicaid Services

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Meaningful Use

Although many in the state have been early adopters in the acquisition of technology, these same organizations may not be utilizing the technology under the spirit envisioned for meaningful use. As an example, the large penetration of electronic health record technology in hospitals is offset by the fact that a much smaller percentage has fully deployed order entry by physicians, e-prescribing, interconnectivity in the broader community; use of decision support tools at the point of service or use of the data for population level management or planned care. These factors highlight the challenge and need for additional training as well as the need for environmental changes that encourage meaningful use. West Virginia is awaiting final guidance from the Office of the National Coordinator and CMS on meaningful use. The state intends to follow the national guidance and until they are issued, will follow the recommendations of the HIT Policy Committee as reflected in Attachment D.

Comprehensive Delivery System

It is important to stress that the priorities that follow extend to all providers in the health care system. This includes oral health, mental and behavioral health, skilled nursing facilities and long term care providers. The true benefits of health information technology will not be realized until the entire health care system is interconnected.

State Priorities for Accelerating Adoption of Health Information Technology

The following is offered as a pathway for the deployment of health information technology for providers in West Virginia.

Priority #1 – Accelerate Adoption and Meaningful Use of Electronic Health Records

Electronic Medical Record (EMR) systems should be deployed by all public and private health care provider organizations in the state by 2015. This should be the highest HIT priority for the state. Robust and meaningful data can be shared when EMR systems are deployed and put to use. There will not be the ability to share meaningful patient data between healthcare provider organizations until the penetration becomes more prevalent. Use of both commercial-off-the-shelf (COTS) and "open source" EMR solutions is anticipated. The key is that the technology systems be interoperable, CCHIT certified (or an appropriate alternative standard should one evolve), and standards-based.

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A. **Encourage Use of Interoperable Electronic Medical Record Solutions:**
The true power of technology will be realized when the medical community fully adopts electronic medical record systems. Both open source and commercial off the shelf solutions should be encouraged. West Virginia providers have purchased commercial solutions from the national market leaders as well as from local state based vendors. The federal stimulus dollars targeted at the physician community should accelerate this adoption curve.

West Virginia is unique relative to its penetration of open source solutions based on the federal investments in the VistA & RPMS systems. Seven state health care facilities and four VA hospitals have implemented the VistA system. The Community Health Network of West Virginia (CHNWV) has implemented RPMS, a variant of VistA, in over 30 clinic sites to date. In order to accelerate adoption of HIT, West Virginia will need to leverage federal resources committed as part of the American Reinvestment and Recovery Act. In addition to these resources, the capital requirements are so significant that open source applications that reduce the entry cost will be a critical focus of the state. To that end, the West Virginia Health Improvement Institute will support a version of the VistA/RPMS open source solution as one alternative for providers in West Virginia.

B. **Require Minimal Level of Functional Requirements and Certification:** Purchases of HIT systems are often made without fully understanding the capacity or functionality of the system. Assumptions are made about population reporting and evidence- based disease management decision support tools embedded in the system that may not be true. To address this issue the Certification Commission on Health Information Technology (CCHIT) was established. CCHIT subsequently developed standards for minimal performance of EHR systems. It is likely that any future federal contribution to HIT will require CCHIT certification of systems subsidized. It is recommended that for West Virginia, the analysis done through one CMS Transformation Grant be leveraged to establish a list of approved vendors. Providers who will rely on external support through this proposed deployment initiative would be able to seek systems from the approved list of vendors. West Virginia will follow the guidance of the HIT Policy Committee of the Office of the National Coordinator.

C. **Encourage Interconnectivity and Ensure the Health Information Exchange Provides Interim Tools Serving as a Catalyst For Adoption of Technology:**
Any system procured through this deployment plan should be encouraged to interconnect with the remaining health system through the state sponsored health information exchange, which is the WVHIN. This will ensure that the benefits of community wide interconnectivity are realized. The WVHIN should provide base functionality such as an

electronic in-box for results reporting; messaging capability; facilitation of e-prescribing and other value added services. As the early adopters point to the positive impact and ease of use this will serve as a catalyst to encourage the early and late majority adopters to move forward with the technology investments or risk becoming left behind in the competitive environment. The issue of information exchange is such a strategic priority for the state it is addressed in depth in the next section of this plan.

D. **Establish a Centralized Source of Information and Technical Support of Providers:**
Physician offices typically do not have the infrastructure and technical expertise to provide Tier I and higher technical support for the use of information technology. As a result, simple hardware and software compatibility issues, network support and other technical assistance needs will need to be supported through a cost effective centralized help desk support. This could serve as a single service for physicians and health professionals to access help for common day- to- day operational support issues (e.g. on-site hardware and support, use of Health Information Exchange, support in data analysis and reporting).

Priority #2-West Virginia Should Establish Regional Information Technology Extension Centers as Envisioned in the ARRA

As funding to support physician acquisition of electronic health management systems becomes available there will need to be a coordinated effort to deploy the resources in the field. The Health Improvement Institute, in collaboration with the WVHIN, CHNWV, and WVMI will apply as the core of a consortium to become a Regional Extension Center for West Virginia.

A. **Make Available Purchasing Decision Support:** Providers interested in adopting technology should be provided the opportunity to benefit from technical support in the purchase of a system that meets their needs. This in part can be done through web based tools (through the Health Improvement Institute or other entities) that provide analytic content leveraging the work of WVMI (through its 8th Scope of Work from CMS) and the Transformation Grants. Social networking functionality could provide feedback from peer users to providers. Structured vendor demonstrations and webcasts could be coordinated in order to ensure that providers are given adequate and comparative information on their purchasing options.

B. **Develop Waves of Structured Deployments:** Once funding is identified and made available to the field through the proposed deployment process it is proposed that waves of providers be supported in their implementation process. This is a similar model to what has been deployed by the Department of Health in New York City where an effort is underway to deploy HIT to in excess of 1000 providers in New York City. A centralized resource

provides the project management support and manages the customization process to ensure that the local systems are not inadvertently morphed into complex systems that are unsustainable to maintain over time. A centralized project management team would backfill for the lack of expertise and staff in the provider offices.

C. **Provide Educational Training Programs on the Use of Optimization of the Technology:** Training programs should be developed and offered on the use of HIT to drive improvement and manage populations of patients. This is a critical part of ensuring the HIT is optimally utilized in the field. The training can be developed offering face- to -face opportunities, on demand modules, and web cast.

D. **Provide Mechanisms For Those Who Have Already Purchased Systems to Engage:** It must be recognized that there are early adopters who invested in HIT and they must be brought into the process. Others can benefit from the lessons and experience of early adopters. In addition, there need to be mechanisms to assist those who already have purchased health information technology to achieve meaningful use. As a result, the training options and any changes in reimbursement should be afforded to those with existing systems as well.

Priority #3-Encourage the Reimbursement System to Promote Use of Technology

Consideration should be given to align the reimbursement system to support HIT adoption in the field. This could be manifested by differential payments established for those who submit electronic claims, use e-prescribing, connect to WVHIN and do voluntary reporting.

Priority #4-Encourage the Adoption of Telemedicine Technology

Telemedicine technology can provide cost effective access to critical and scarce resources in the state. Telemedicine should be encouraged through a variety of demonstration programs and knowledge management associated with best practice models that have proven efficacy. This applies to home monitoring of chronic illnesses, sub-specialty consultations in the clinic, remote diagnostics and behavioral health services.

Priority #5-Encourage e-Prescribing

The state must continue to build on existing public/private sector collaborative efforts to develop and implement *ePrescribing* in West Virginia. ePrescribing allows physicians to order prescriptions through computers instead of using a paper-based Rx and handwritten signatures, thereby reducing medical errors and duplication of effort and prescriptions. Efforts continue on removing barriers to ePrescribing and developing a statewide implementation plan involving both public and private partners.

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Priority #6-Encourage Use of Personal Health Records (PHR)

Personal Health Record (PHR) systems that allow individual citizens to maintain their own lifelong electronic medical record should be a priority. PHR systems will truly transform healthcare in West Virginia when these systems begin to see widespread use in the coming years. The recent emergence of Smartphone applications (e.g. iPhone; Erickson, Nokia), that allow for remote monitoring from home, present new opportunities for patient engagement. Deployment of effective PHR systems will be dependent on putting in place the state-wide EMR and WVHIN systems that will allow individuals to easily obtain electronic copies of medical data related to their treatment by physicians and various healthcare provider organizations anywhere in the state. PHR systems developed and deployed by public and private sector healthcare provider organizations will need to comply with the state's health IT architecture and standards. There will be a need to identify and pilot test secure web-based health vault solutions for citizens to use for storing their PHRs.

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Health Information Exchange

Senate Bill 170 established the West Virginia Health Information Network (WVHIN) as a coordinating entity for health information exchange for the state of West Virginia. The mission, vision and guiding principles of the WVHIN are presented in Figure 3. This section focuses on implementing the business plan of the WVHIN.

Figure 3. WVHIN Vision, Mission and Guiding Principles

Vision

High quality patient centered health care services facilitated by health information technology.

WVHIN Mission

The West Virginia health Information Network provides the health care community with a trusted, integrated and seamless electronic structure enabling medical data exchange necessary for high quality patient centered care.

Guiding Principles

To achieve its mission, The WVHIN abides by the following guiding principles:

- *Collaboration* -- The WVHIN works in collaboration with private/public partners, providers, other health care stakeholders, and consumers.
- *Facilitation of Patient-Centric Care* – Authorized clinicians have access to available information at the point of care, regardless of where the patient has been seen or where the physician is located. Data movement will ease utilization of health care systems by consumers, providers and all related support entities.
- *Participation By All Providers* – *A*ll providers have access to affordable solutions, regardless of location.
- *Quality Improvement* – The provider and payer communities have access to tools to improve the quality and efficiency of care through greater access to data over time and improved data analysis tools (e.g. ePrescribing, chronic disease management).
- *Patient Participation* -- The patients, over time, have access to information and electronic tools enabling them to take responsibility for their own care and wellness along with their physician.
- *Privacy and Security* – Patients are assured that their personal data are held private, confidential and secure in accordance with HIPAA and other state and national requirements.

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As with all the strategies set forth in this plan, health information exchange is intimately intertwined with the adoption of health information technology by the provider community. The WVHIN intends to help build the enabling infrastructure that facilitates health care transaction. Figure 4 presents a visual depiction of the role the WVHIN will play in connecting stakeholders in the health care system.

Figure 4. Health Information Exchange Conceptual Model

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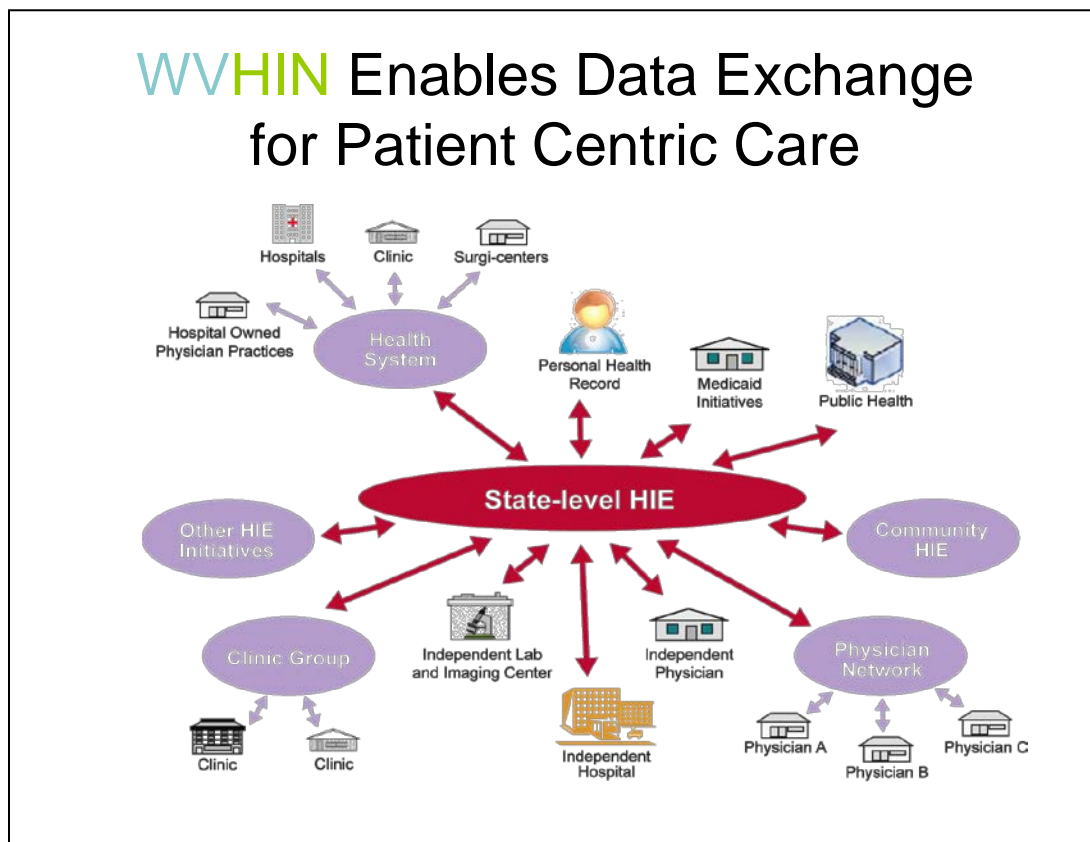
Physician Adoption is Key to Success
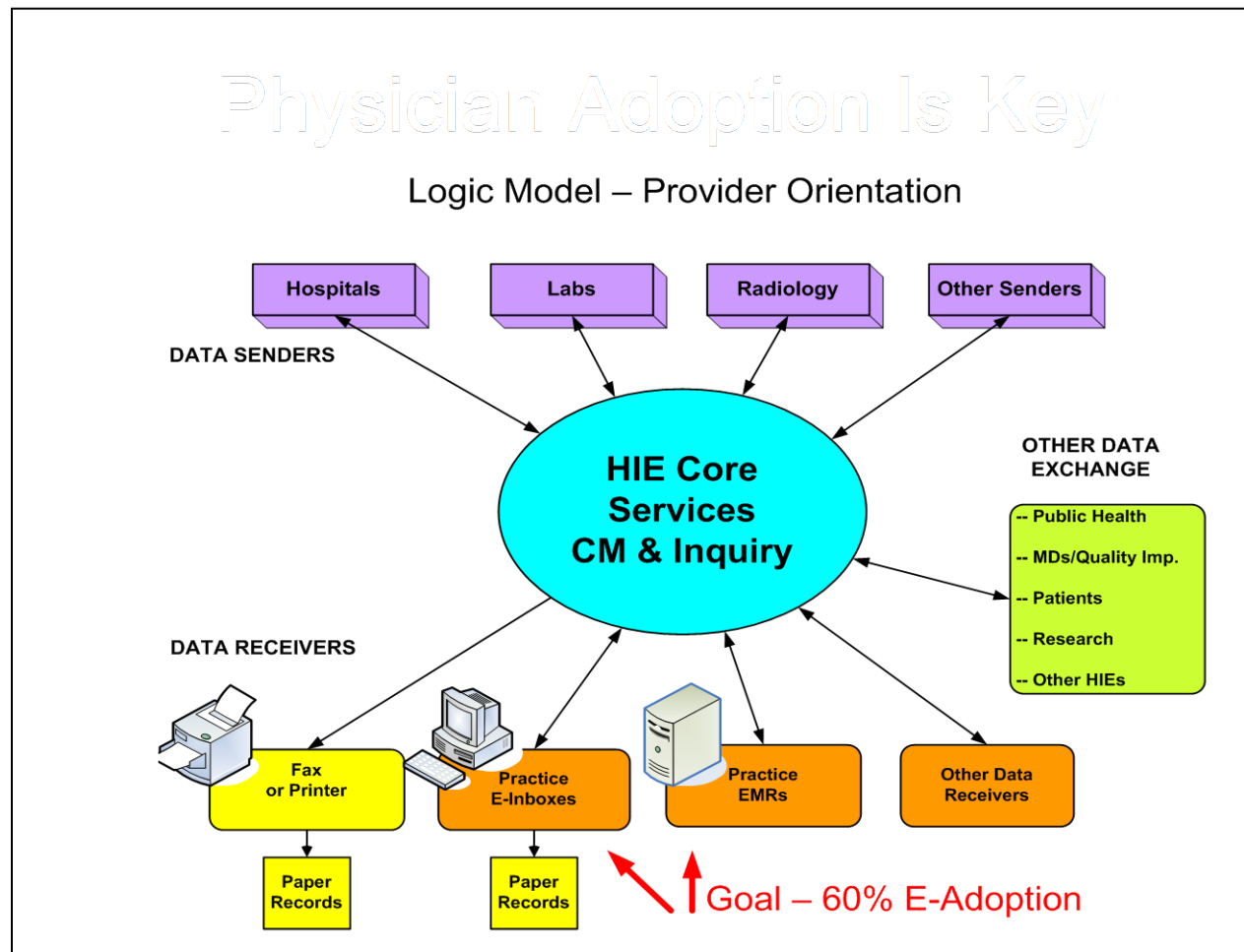
Adoption of electronic tools by physicians is essential to the success of data exchange and to bringing the right electronic data to the physician at the point of care. The rule of thumb is that 60% of the physician community must be using electronic tools, and exchanging electronic data in order to achieve the critical mass needed to bring the entire physician community on board to participate in a Health Information Exchange (HIE) such as the WVHIN. The WVHIN is doing this in several ways:

- The WVHIN encourages all physicians to use EMRs, but for those who cannot afford an EMR or are not ready to adopt one, the WVHIN will seek to provide physicians, at little cost, with a set of work flow tools to connect to the HIE and view or exchange patient data. If physician practices already have an EMR, WVHIN will provide direct data feeds from the HIE. For those with basic EMRs, WVHIN will encourage and support efforts to migrate physicians to more advanced EMRs with quality measurement tools.

- The WVHIN will help establish a Physician Advisory Group to build momentum around the state. Key roles include determining HIE functionality and services, participating in community pilots, and providing input on physician fees for services.

Plan to Roll Out the WVHIN By Communities

The WVHIN plans to roll out a statewide solution over a four-year period moving from community to community with a goal of eventually achieving statewide implementation. While some institutions may initially choose to build their own enterprise-wide or local health information network. The aim should be to ultimately incorporate them into the state-wide WVHIN. The first step is the roll out of two initial communities within the next year.

The key to success in each community will be the participation by the hospitals and physicians with other providers such as nursing homes, ambulatory centers, clinics, and public health among others. A high level of engagement by the initial communities is important to building momentum for the rest of the state. Initial communities will reflect strong physician leadership and use of e-tools; health system collaboration; a history of actively engaging clinics, clinic networks and rural areas; demonstrated ability to collaborate; and favorable political environment.

Meaningful Use

The HITECH Act provides incentive payments under Medicaid or Medicare for eligible providers who have adopted certified EHR systems, and who meet statutory requirements for "meaningful use." Meaningful use of an EHR system, as defined by law, has three key components: (1) The EHR system must be certified and include e-prescribing capabilities; (2) The technology must provide for EHR exchange with other systems; (3) The system must produce reports using various yet-to-be finalized clinical and quality metrics. Incentive payments are expected to begin in 2011.

The WVHIN and the Bureau for Medical Services (Medicaid) are working to address meaningful use requirements. Task forces were established to vet through key issues in the areas of functionality, data standards, technology, privacy and security as these areas relate to meaningful use and the guidelines within the HITECH Act. The WVHIN will modify its pathway based on task force output and will enable providers who exchange data, via the WVHIN, to meet meaningful use requirements to qualify for incentive payments under Medicare and Medicaid.

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Physician Leadership

A statewide Physician Advisory Group is being established that can drive physician participation statewide and can help mobilize the physician leadership at the community level. While traditional wisdom is that physicians are hard to organize, there are a significant number of physicians who have a high vested interest in making sure all physicians can participate in the HIE. Of importance, those physicians with EMRs cannot optimize their own practice unless they are able to exchange electronic data with other physicians.

Technology Plan and Selection of Vendor for WVHIN Infrastructure

Recently, the WVHIN issued a Vendor Request for Information (RFI) resulting in 17 vendors showing an interest in providing an HIE infrastructure for West Virginia. Starting in the winter of 2009, WVHIN plans to begin a transparent six-month stakeholder-based vendor selection process that will culminate in the selection of a vendor in 2010. During this period, the WVHIN will narrow down the vendors to the vendor of choice, and a second vendor for final negotiations.

Coordination and Alignment

Medicaid, as a major payer and component of the health care system, will continue to upgrade its MMIS system consistent with the Medicaid Information and Technology Architecture framework. As a result, the WVHIN will incorporate and comply with the MITA technical standards as identified by Medicaid, and wherever possible, to facilitate the exchange of administrative data.

WVHIN Pathway

The WVHIN recommends a three-phase pathway over the next four years to achieve the WVHIN Mission and Vision. The intent in the early phases is to build the HIE infrastructure, achieve critical mass among physicians, reduce inefficiencies from paper transactions, and improve coordination of care. Building on this infrastructure, later phases will focus on expanding data exchange capabilities that significantly improve quality and value of care.

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State Priorities for Health Information Exchange

Priority # 1- State Institutions Will Be Early Adopters of Use of the Health Information Exchange

The state institutions currently serve a segment of the population and could benefit from the interconnectivity of information systems to better meet the needs of the populations they serve. Improvement in communication of information could improve efficiency and quality of care delivered. As a result, the state institutions will strive to become early adopters of the health information exchange.

Priority # 2- Encourage Clinical Messaging

Clinical messaging is a leverage point to transition the provider community from paper to electronic transactions and a way to establish data exchange between separate health systems. Provision must be made for providers and facilities at varying levels of EMR usage, from no EMRs to meaningful use of advanced EMR systems. Clinical data exchange includes transferring lab, radiology, and hospital reports from providers to physicians and cross-referrals between physicians. It also includes data feeds to and alerts from public health.

Priority #3- Coordination and Continuity of Care

Care can be improved and better coordinated by enabling authorized physicians and other clinicians to look up key clinical information from multiple providers, regardless of where the patient has been seen or where the clinician is located. Key information includes: lab, radiology and hospital reports; diagnoses, problem lists, medications, allergies, and immunizations. This process can be facilitated through the use of a federated data base model. This ensures that data are made available at the point of care only.

Priority #4- Improve Quality and Value

Quality of care and value can be improved by establishing data feeds that allow data to be accessed for additional uses under the strict guidance of board policy for data access. Possible uses:

- **Physician Analysis** – The ability of physicians to do longitudinal analysis of patient clinical data and the use of advanced quality tools to improve quality and value of care, thus demonstrating meaningful use of data.
- **Public Health** – The ability of public health to do syndromic surveillance and population health.
- **Personal Health Record (PHR)** – This includes data feeds from EMR systems connected to the HIE into the personal health record.
- **Research** – Within the guidelines of the board, make data available for other research.

Ensure Broadband Infrastructure Is Available to Support Technology Use

Providing access to health services in West Virginia is a challenge. Nearly two -thirds of West Virginians (64%) live in rural areas. As a result, 80% of the population lives in communities of less than 5,000 people. All except for four of the state's counties are designated as Health Professional Shortage Areas or Medically Underserved Areas. The terrain is rugged which adds to travel time for access to health services. [5]

Market-driven deployment has extended broadband access to almost all of West Virginia's cities, towns, and other concentrated areas; it is some of the most rural areas of the state that remain underserved. That based on the same network principles that providers of telephony services have faced since the inception of the telecommunications industry, high fixed costs, and technological limitations permit broadband networks to extend into rural areas only so far before the level of demand in those sparsely populated areas no longer justifies the construction costs. West Virginia's unique topography and demographic make-up further hinder the provision of broadband access to rural areas of the state. Specifically, West Virginia's mountains and hills significantly increase the cost of deploying broadband infrastructure. At the same time, West Virginia's high-percentage of elderly and low-income households are the least likely to own computers or subscribe to Internet service. In light of these topographical and demographic challenges, any attempt to fill the gaps in West Virginia's broadband availability must be organized according to the levels of demand in the various underserved areas to which service is sought to be extended. [6]

The business model to stimulate investment in local infrastructure is also complicated by the complex financial market in health care. The primary users of the technology will be physicians and health care organizations. Current business models require that they make the investments in the infrastructure and technology and pay for the carrying costs in the near term. However, the benefits derive downstream to the payers. As an example, most tele-medicine services are not reimbursable through commercial payers; although, Medicaid is getting ready to open a code to cover telemedicine services. The reimbursement environment will need to be addressed as part of any strategy that will create local demand sufficient enough to support adoption of technology.

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[5] Source of Data: http://healthcarereform.wvlegislature.gov/resources.cfm.

[6] Adapted from House Bill 4637.

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Broadband Council

Recognizing these challenges, Governor Manchin had introduced and signed upon passage in February 2008 House Bill. This bill established the Broadband Council whose mission was to develop a plan for the state to make every municipality, community, and rural area in this state, border to border, accessible to the Internet through the expansion and extension of broadband services and technology. The Broadband Council has been working in earnest to explore plans and a business model that will support the aims of interconnectivity throughout the state. Any strategic initiatives focused on health care must coordinate and align with this existing body and its mandate.

Health Care Authority Mandate

The HB 4637 also requires the WV Health Care Authority (HCA) to develop a written report for the council, due October 31, of each year detailing existing broadband capabilities and unmet demand for WV's health care system as follows:

> The chair of the West Virginia healthcare authority shall submit a written report to the council by the thirty-first day of October of each year describing in detail the existing broadband infrastructure owned, leased, used, operated or purchased by all hospitals, medical facilities, clinics or healthcare providers; all programs, initiatives, or applications utilizing broadband that are promoted by hospitals, medical facilities, clinics, or healthcare providers; and any unmet demand for broadband by hospitals, medical facilities, clinics, or healthcare providers. W. Va. Code § 31-15c-11(f).

Telehealth Alliance

The West Virginia Telehealth Alliance (WVTA) was established as a non-profit organization dedicated to advancing Telehealth use and capabilities throughout the Mountain State. Participants in the alliance include hospitals, rural health care centers, medical schools (WVU, Marshall, CAMC, and W.Va. School of Osteopathic Medicine), doctors, mental health centers, local health departments, senior groups, consumers as well as AFL-CIO and the West Virginia Chamber of Commerce, and major telecommunications companies.

The West Virginia Telehealth Alliance is one of 69 organizations across the U.S. that has been selected to participate in the FCC's Rural Health Care Pilot Program. As such, the WVTA will have approximately $9.7 million in state and federal funds to improve broadband connectivity

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among eligible health care entities in the state. The West Virginia Telehealth Alliance has developed a plan to provide for an interoperable statewide health information network to advance the use of Telehealth applications and services, as well as the transmission of electronic medical records and information.

The West Virginia Telehealth Alliance's efforts are an important near-term priority to help improve and bridge some of the gaps in wide band infrastructure. The current plan and extent of resources will connect 300 health care entities via advanced broadband services and access. Unfortunately, the scope of their project only covers eligible entities, which does not include private physician practices and the for profit entities in the health care system. As a result, there still remain challenges regarding broadband connectivity services among the rural physician community.

State Priorities for Accelerating Access to Broadband Infrastructure

Priority #1- Complete a Broadband Inventory to Identify Gaps and Needs

The Health Care Authority should complete its charge in 2010 to develop a statewide inventory and needs relative to wideband access by the health care system. This should include the needs of the rural providers and critical access hospitals. This information should be used to establish the priorities of the state.

Priority #2- Provide Funding For W.Va. Telehealth Alliance to Support Its Mission

The West Virginia Telehealth Alliance is a new non-profit organization, and, as such, has been reliant on start-up funds for its initial operational needs. These funds have come from the state of West Virginia and from philanthropic organizations. However, a long-term and stable funding source is needed to continue its mission of advancing Telehealth and telemedicine. A sustained funding commitment will ensure there will be appropriate project management and technical coordination resources to facilitate Telehealth use among health care entities, and to expand remote specialized care and services to rural residents across our state. The state of West Virginia also should create a Telehealth advancement fund that can be leveraged to secure future grant dollars that would help to expand or implement telemedicine projects. Existing federal grant programs include the USDA's Rural Utility Service telemedicine program or the FCC's rural health universal service fund.

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Priority # 3- Align Health Services Reimbursement Models that Translate Into a Support Local Business Case For Investments in Technology Infrastructure

Recent emerging models associated with the medical home allow for cost shifting from inappropriate utilization of care (currently estimated at 30% of the health care dollar) toward primary care. These are often in the form of a bundled case rate or a per member, per month fee for caring of the population. This bundled fee is intended to pay for the investments and carrying costs of services needed to serve as a medical home (e.g. for care managers, investments in electronic health records, telecommunication expenses). Several medical home demonstration projects are underway exploring some of these reimbursement models. As these pilots mature, the state and payer community should move toward adapting reimbursement to allow for some of this cost shifting to enable local markets to be better supported for the telecommunication investments.

Priority #4: Work With the Vendor Community to Encourage Local Investments

The state should engage the vendor community in strategic dialogue to develop the long -term investment plan that is necessary to complete the vision of HB 4637. This includes roll out of advanced cellular technologies that eliminate some of the more costly infrastructure investments that might inhibit the timeline for connecting the whole population.

Access and Usability of State-Wide Information

The availability of data on access to care, health system performance, clinical outcomes, health care utilization and cost is critical to proper statewide planning, and for improving the quality of health services. Data are the voice of the process. Transparency of data allows for healthy competition to improve performance. Data on health system performance allows consumers to make informed decisions.

Primary care providers have used electronic health record systems and clinical registries to drive improvement in clinical outcomes. A good example of this is in June 2009 the Health Resources Services Administration (HRSA) recognized twenty community based health centers for their voluntary reporting of data, and for reaching national benchmark levels of performance in a two- day meeting held in Bethesda, Maryland. FamilyCare of West Virginia was one of the three showcase presenters at the meeting. The executive director (Martha Cook Carter) attributed her ability to drive improvement results to having the data systems to track outcomes and make them transparent to all of her staff. Across all twenty showcase organizations data and transparency of the data were held out as one of the core drivers of successful improvement in clinical outcomes. These same organizations also demonstrated how

use of the data drove the business case, and in multiple cases how the theory about the potential for cost reduction actually plays out in the field when data are available to drive decision- making.

As the investments in technology are made and the adoption curve increases it will be equally important to ensure that the data systems are supporting the decision support needs of the state and its key stakeholders.

Priority #1- Leverage MITA to Enhance State Data Warehouse Infrastructure

The Medicaid Information Technology Architecture (MITA) Framework is a blueprint that West Virginia and other states are using to examine their business priorities, plan future improvements, and acquire technical applications that meet health information technology (HIT) needs of both the state and the federal government. The MITA Framework describes a logical architectural approach for the state and its Medicaid enterprise. It includes a Business Architecture (BA), Information Architecture (IA), and Technical Architecture (TA). The MITA Framework, processes, and planning guidelines ensure that technology decisions align with state and Medicaid business needs and goals. It is a MITA principle not to implement technology simply because it is available.

The MITA program also provides significant federal financial support for those states committing to use the MITA framework approach. This match can be as much as 90% federal contribution for capital investments and 75% match for operational support. West Virginia will use the MITA process to guide its integration and alignment of state MMIS and data bases with the Bureau for Medical Services (BMS) and DHHR. The MITA process is described in Appendix C.

Priority #2- Ensure Adoption of Key Standards to Guide Health Information Technology in the State

West Virginia plans to follow the lead of the federal government and ensure that health IT systems implemented in the state comply with these standards adopted at the national level. For more information on national health IT standards activities of the HHS Office of the National Coordinator for Health Information Technology (ONCHIT), visit http://www.hhs.gov/healthit/standards/background/. In addition, the West Virginia Office of Technology has issued state IT guidelines and standards that will also be adhered to as state-wide health IT systems are acquired, developed and deployed – see http://www.state.wv.us/ot/default.cfm?fuseaction=TechStndrds.

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Priority #3: Establish Security Protocols and Guidelines for Protection and Use of Data

In order for reporting systems to be sustainable there will need to be access to the data sets by payers and key stakeholders. However, there must be protocols in place guiding the access, use and security of the data. A plethora of standard organizations, including the National Institute of Standards and Technology and the Office of the National Coordinator for Health Technology (ONCHIT) have adopted standards to guide security and data management (e.g. HIPAA, HL7, NCDCP, DICOM, IEEE1073, SNOMED CT, LOINC). A privacy framework has been adopted by the Executive Branch. These principles have been shared and input has been sought from a Consumer Privacy Committee of stakeholders made up of consumers, providers and the business community. The minimum standards will be widely communicated and continue to evolve as experience and maturity with data sharing and use continues. The protection of the privacy of individual level data will be a high priority in order to continue to gain the confidence of the general public with respect to the routine transmission and use of health information.

Priority #4- Encourage Payers to Voluntarily Report Claims Data to the Centralized Warehouse Quarterly

The payers in West Virginia came together in 2007 and voluntarily provided five- year claims data to the West Virginia Health Care Authority. Efforts to scrub the data and develop analyses of patterns and trends are underway. Quarterly reporting of claims data will allow for patterns and trends in the state to be monitored over time, and used to drive heath policy and improvement of the care delivery systems.

Priority #5- Encourage Providers to Voluntarily Report Clinical Data Centrally On a Monthly Basis

As a condition of participation, providers should be required to report on a core set of measures that represent process, outcome and structural indicators of quality. These data can be provided back for normative comparisons and feedback and used by the practices to improve their quality of services. A system similar to the Wisconsin Physician Voluntary Reporting Initiative is envisioned.

Priority #6- Provide Transparency in Line with the Patient Health Charter

The state will migrate towards transparency for the patient population consistent with national trends associated with adoption of the Patient Charter. Online health information resources needed by healthcare providers and consumers need to receive continued support. Examples include the CompareCare West Virginia and HealthyWV websites. These are highly visible, but relatively low cost initiatives. A robust solution tailored to meet the needs of the citizens of

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West Virginia could be developed and implemented in relatively short order, given the large number of existing public and private sector health information web sites already available on the Internet (e.g. WebMD, MedLine Plus, etc.).

Priority #7- Information Will Be Used to Drive Improvement in Key Areas of Need Throughout the State

A major benefit of technology is the ability to assimilate and process data and information for use in planning and coordination of care. The state will use the information to launch improvement efforts on focused disease areas and care opportunities consistent with the priorities of the state's GOHELP Office that will evolve over the course of 2009 and 2010.

Develop the Work Force

The acceleration in the adoption and use of technology brings new challenges in terms of the work force. As the environment moves from a paper-based system with stakeholders often working in silos to an electronic interconnected world this brings new skills needed to function in the environment. Examples of skill needs include:

- Fundamental use of micro-processing technology; especially for older generations of the work force not yet comfortable with the electronic world.
- Information Technology Network support in order to ensure reliable infrastructure supporting access to technology.
- Maintenance of secure environments for patient level data.
- Analytic skills, especially in the use of population level data.
- Use of remote monitoring technology by consumers.
- Work- flow redesign skills as organizations and provider practices prepare to automate their work environments.
- Privacy strategies and compliance quality control (HIPAA).

While technology brings challenges to the state of West Virginia it also brings opportunities. The work force issues are national in terms of impact and need. As a result, an opportunity exists for West Virginia to become the *Health Technology State* and a national resource for a trained workforce seasoned and experienced in the use of technology.

The growth and impact of the use of technology in the state is significant. The opportunities set forth by this plan will create job growth in the state in the following areas:

- Health Information Exchange-implementation and support personnel.
- Help Desk Personnel supporting local and national needs.

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- Telecommunication vendor staff necessary to support local sales, implementation and support.
- Health Care personnel with networking, data entry and analytic expertise.
- Consultants with security and privacy expertise.
- Faculty and staff within the educational community.
- Regional Extension Center Technical Assistance staff.
- Personnel involved in Marketing/Communication/Awareness/Training in support of technology use.

The growth of health information technology presents significant opportunities to grow the job sector and contribute to the tax base and economy of the state.

State Priorities for Developing the Work Force

Priority #1- West Virginia Intends to Establish Regional Extension Resource Center Consistent with Federal Guidance Through the ARRA

The Health Improvement Institute, in collaboration with its member organizations (WVHIN, WVMI, Telehealth Alliance) will become a Regional Extension Resource Center providing technical assistance, education and training support for West Virginia and several other states in the region. WVMI is currently serving as the QIO for Pennsylvania and Delaware. Through its efforts, technical assistance is already being provided to the provider community. The effort will be strategic, recognizing the local differences in needs, culture and market dynamics. However, the lessons learned from this broad environment will be leveraged to help West Virginians continue to develop the work force necessary to support health information technology.

Priority #2- Establish Centralized Source of Information and Technical Support for Provider Practices

The states should establish centralized Help Desk support for provider practices, providing rapid access and support for common issues supporting their technology. A centralized resource would provide a cost effective support, and avoid the need for investment in the human resource at the practice level. The Help Desk would provide Tier 1 Support for common problems and then should be connected to vendors and subject matter experts for Tier 2 and 3 level supports for more complex issues. The system should also track utilization and cycle time for problem resolution to inform future strategic planning efforts.

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Priority #3- Train, Recruit and Retain Professionals With Skills in the Use of Information Technology

The state should initiate efforts to recruit and retain health professionals with skills in information technology. This should include aligning messaging with the University community, the business community, the media and the health care system.

Priority #4- Build a Pipeline of Health IT Professionals

The national focus and growth in health care information technology represents an opportunity for the state to build a pipeline of health professionals, and serve as a national resource pool for the health information technology sector.

A. **Collaborate With Professional Societies to Ensure IT Training is Built Into State Based Conferences and Continuing Education Opportunities**: The health care professional organizations and societies (e.g. Academy of Family Practice; Academy of Pediatrics, Osteopathic Association) should include into their annual meetings and professional training programs skill building opportunities in health information technology. An example is the Medical Foundation of West Virginia has already partnered with the West Virginia Medical Institute (WVMI) to offer resources on demand, on selection of electronic health record systems and how technical assistance might be sought to assist with the decision process.

B. **Coordinate With the State Based University System and Community Colleges to Ensure Program Offerings Are Available and Adapted For the Health Care Industry:** A state-wide collaboration within the academic community including the universities, colleges and community colleges to link training programs and training opportunities with the health care system. This might include internship programs in the health care system for young professionals in training.

C. **Ensure Use of Technology is Built Into Medical Education and Training:** Medical Education & Training is needed to create new high value jobs and enhance the skills of the healthcare workforce needed in the 21st century. Medical and nursing informatics curriculums need to be established and implemented in colleges and universities across the state. Hands-on training using EMR systems should be part of any education and training programs. Use of modern online and distance learning approaches in healthcare could also prove to be a very cost beneficial approach for the state to consider. Collaboration between academic institutions is important to accomplishing this initiative.

D. **Leverage State Based Infrastructure to Offer On Demand Electronic Training Opportunities:** The state already has benefitted from infrastructure supported by the AHEC, by the cable companies and other technology resources. This infrastructure should be leveraged to provide on-demand training opportunities for health professionals.

E. **Encourage Hospitals and Health Systems to Continue to Support Training Opportunities:** Hospitals and health care systems have been a resource for training of health professionals in the use of technology. These organizations should be encouraged to continue to provide these supports and to further collaborate with the academic and professional organizations to align the training opportunities.

Ensure Long Term Financial Viability and Sustainability

The strategic plan sets forth a series of priorities for the state to ensure it achieves its vision articulated earlier in the draft. The strategies do not come without associated resource requirements. This section is intended to present aggregate investment needs for the state for public policy planning. In addition, a strategy for financing the vision outlined by the plan is proposed.

Financial Resources Needed to Achieve the Vision

The financial resources required for West Virginia are estimated in excess of $300 milion to achieve the vision set forth in this plan. [7] These resources include:

- The cost of supporting the majority of providers who have yet to invest in an electronic health record system.
- Investments in the Health Information Exchange and its operating capital needs.
- Investments in data sharing, systems for transparency, and analytic resources.
- Provision of technical assistance throughout the state as a Regional Extension Center.
- Support of Help Desk Functionality.
- Work Force demands to train health professionals.

These resources at face value appear to be extraordinary. However, they represent less than 1% spent on health care annually in West Virginia. These same costs equate to keeping 500 seniors out of a nursing home for one year using telemedicine technology.

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[7] Planning estimate provided by Jack Schaffer, consultant to DHHR and BMS.

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Financial Barriers

There are many financial barriers to adoption of technology. The recent economic recession has further exacerbated the gaps. One of the more challenging issues is the structure of health care that leads to the phenomenon that those who need to invest in technology may not be the ultimate beneficiaries from the capital investment. As an example, the cost of investing in an electronic health record technology system for a primary care provider is estimated between $45,000-$65,000. Once these investments are made they can result in fewer medication errors, improved outcomes and care management through better decision support and many of the benefits previously cited. The conundrum is that these improved efficiencies result in downstream savings in the form of lower medical loss ratios for those that pay for services. There are no simple mechanisms for the cost shifting of these resources.

It is also important to note that the issue is not simply about financial resources. There are numerous examples pointed to by skeptics of the failure to properly utilize the resources when they were made available. In West Virginia the experience of one health plan supports this challenge. Despite putting up significant financial resources for physician practices to adopt electronic health records, the adoption curve was slow and in some cases failed execution of the installations. [8]

The lesson from these experiences is that a comprehensive and integrated strategy is necessary to support the acceleration of adoption of technology. This includes providing resources to accelerate the adoption curve; technical assistance to guide the process; and creating an environment and marketplace that reinforce the use of technology. Providers need as much assistance in changing and adapting their process flows in the practice as they do with the purchasing and implementation with the technology.

Financing the Resources to Achieve the Vision

The most challenging aspect of a technology plan is the financial strategies necessary to achieve the vision. A key design principle is that the burden of support not fall on any single stakeholder group (albeit the government, payers, providers or consumers). There also needs to be a long term view and recognition of the need for system thinking in terms of how many of these strategies intertwine with other sectors of the economy and state government. The guidance evolving from CMS and ONC is clearly communicating the need to develop sustainable financing strategies that do not rely totally on the federal government for funding HIT. Finally, in light of current economic times this burden needs to be supported by market driven models that help

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[8] Source: Phil Wright, Executive Director of the Health Plan of the Upper Ohio Valley

redeploy the waste in the current system and lead to long term sustainable business models. To that end, the following key strategies will need to be leveraged:

State Priorities for Financing the Vision

Priority #1- Leverage Federal Partnership

West Virginia, as a rural and less populous state, does not have the resources to finance the technology needs of the state. As a result, it must seek partnerships that leverage resources while allowing the state to retain its innovative and leadership spirit in the execution of its HIT strategies. The recent American Recovery and Reinvestment Act (ARRA) make available resources to enable providers to adopt health information technology as well as resources to facilitate the vision for the Health Information Exchange. The MITA vehicle working with Center for Medicare and Medicaid Services (CMS) also provides a framework to leverage federal resources to launch the vision for an integrated and interoperable set of information systems. The Office of the National Coordinator for Health Information Technology also represents a partnership opportunity.

Partner With CMS and ONC to Use the MITA and ARRA Vehicles

A. **Partner With CMS to Utilize MITA Resources:** The MITA vehicle, through a partnership with the Center for Medicare and Medicaid Services, CMS should be pursued as a mechanism to fund and accelerate development of much of the state infrastructure needed to create an environment that encourages data sharing and use of data for decision making.

B. **Partner With CMS To Leverage the ARRA Resources:** It is estimated that in excess of $80 million will be necessary to support providers in West Virginia with investments in electronic health records technology. The ARRA provides incentive payments totaling $45,000 over five years to encourage capital investments by medical providers. West Virginia is well positioned to be an early adopter state to demonstrate how those resources can be efficiently distributed in the field while minimizing the execution failure. The penetration of open source technology in West Virginia also offers a national model for consideration that could help the federal government better leverage its own resources as it moves forward.

C. **Partner With Office of National Coordinator (ONC):** West Virginia should pursue a partnership with the ONC to fund the West Virginia Health Information Network. As West Virginia's designated health information exchange, it is well positioned to

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assist providers achieving "meaningful use." Because ONC will be funding a state designated health exchange in every state, and because the work of the WVHIN already accomplished in terms of governance, stakeholder collaboration, communication, business planning, privacy and security, West Virginia is well positioned to assist ONC in meeting its objectives. Additionally, the demographics of West Virginia in terms of size, geography, burden of illness and rural and urban challenges make the state an attractive candidate for health information exchange planning and implementation grants. The sophistication and experience of the state in health information technology as well as its current partnership with ONC in building the Nationwide Health Information Network, enhances that position.

D. **Leverage State or Interstate Partnerships:** Opportunities will arise to meet a broader regional or national need through partnerships. West Virginia should be a leader in exploring opportunities to meet these broader needs while reducing the cost burden to the state through shared infrastructure. West Virginia will place a high priority on collaboration.

Priority #2- User Fees, Viable Marketplaces and Reimbursement Reform

Technology will need to become a key cost of business, supported through user fees (e.g. transaction costs and monthly utility costs). Providers will need to procure local bandwidth support; invest in hardware and software solutions and transmit information through the health information exchange. As utilization increases and the adoption curve reaches critical mass, a viable marketplace should evolve to sustain the use of technology.

The financial incentives available through the ARRA may stimulate the adoption curve. However, these resources will be spread over several years and do not cover the full costs of supporting health information technology. As a result, providers will be asked to invest ahead if in receipt of the resources. When one factors in annual capital replacement costs, licensing fees, telecommunication fees and other direct and indirect expenses these will continue to present barriers to adoption of technology. Reimbursement reform would allow for cost shifting of resources to enable medical providers to adopt technology. This could be accomplished as part of the models being proposed for the patient centered health care home environment (a.k.a. medical home, patient centered medical home). West Virginia is implementing several pilots that are testing some of the reimbursement models and their impact on tracking outcomes and cost. Lessons from these pilots could be deployed to new reform models. It must be recognized that the shifting of resources will need to be budget

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neutral (if not deflationary) as it is unlikely new resources from outside of the health care system will be available to support the cost of technology and its use.

Once the results of the Medicaid Transformation Grants are analyzed and processed, the lessons should be factored into a State Plan Amendment with CMS providing a new model of reimbursement for providers under the broader auspices of the medical home. This should apply to the PAAS, managed Medicaid and SSI populations. It is recommended that PEIA and the payer community (e.g. Mountain States Blue Cross and Blue Shield and the other payers in the state) should pursue similar pathways. Efforts should be put forth to ensure that the payer community is supporting adoption of health information technology by its respective provider networks. As funds become available through Medicare and Medicaid it is important that incentives payments intended to support health care providers are translated and deployed into the field.

Priority #3- Role of the State in Driving Technology

The Office of GOHELP is charged with the responsibility of monitoring and updating this health information technology strategic plan. The GOHELP Office will establish a coordinator position for the state to drive the strategic plan execution, foster national partnerships, and maintain the strategic plan as a dynamic and evolving planning tool.

There will continue to be important roles the state will need to play in guiding the technology vision, as well as ensuring the environment is supportive of technology. There are certain infrastructure components that will need to be supported in a public utility model such as the Health Information Exchange, and the role the Telehealth Alliance is playing in coordinating infrastructure priorities in communities. The state should consider providing an EMR to rural West Virginia under a public utility model. Use of a "public utility" approach that has proven effective in deploying water, sewer, electric, phone and cable services, especially in rural and underserved areas, could accelerate adoption and deployment of HIT for population-based health improvement objectives, particularly for primary care providers serving at-risk patients and rural areas.

As a result, it is recommended the state budget the resources into future state budgets for these important coordination and public function roles.

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Appendix A: West Virginia Health Information & Technology Standards

1.0   Health Information & Technology Standards

1.1   Overview

Health information, messaging, terminology and other related technical standards are critical to the advancement of West Virginia's strategic health IT plans and its vision, business plans, and goals for improving health care in the state. Well -defined standards are the foundation for health care systems and the promise of electronically enabled health care and interoperable electronic medical records (EMR). By harmonizing standards, different information systems, networks, and software applications will be able to "speak the same language" and work together technically to manage and use consistent, accurate, and useful health information for providers and consumers.

Under the auspices of the U.S. Department of Health & Human Services (HHS), the Office of the National Coordinator for Health Information Technology (ONCHIT) and the Health Information Technology Standards Panel (HITSP) have established a portfolio of clinical data, messaging, and terminology standards that will enable the country to build interoperable health information systems.

The state of West Virginia intends to adopt the key health IT standards that have been developed and are being used by the federal government pertinent to the health care environment and initiatives being pursued by the state.

Healthcare Information Technology Standards Panel (HITSP)

Currently there are more than a dozen organizations creating healthcare information standards in the U.S. These standards are at times redundant, competitive, non-interoperable, or non-existent. To achieve universal functionality there must be agreement on a common set of healthcare information standards that must be consistently implemented by vendors and healthcare providers. The Healthcare Information Technology Standards Panel (HITSP) has been sponsored by ONCHIT to harmonize the relevant information standards. HITSP brings together representatives of the private and public sectors to make possible the interoperable exchange of health care data across the United States. HITSP is a volunteer-driven, consensus-based operation. The Panel's 480 member organizations represent consumers, health care providers,

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public health agencies, government agencies, standards developing organizations, and other stakeholders--all working together to identify the most appropriate standards for specific use cases involving patients, providers, and government agencies. HITSP is committed to an open and transparent mode of operation and to facilitating standards harmonization efforts that support interoperability, accurate use, access, privacy and security of shared health information.

See http://www.hhs.gov/healthit/standards/activities/ and http://hitsp.org

1.2   Background

On March 21, 2003, the U.S. Departments of Health & Human Services (HHS), Department of Defense (DoD), and Veterans Affairs (VA) announced the first set of uniform standards for the electronic exchange of clinical health information to be adopted across the federal government. See http://www.hhs.gov/healthit/chiinitiative.html .

These standards included:

- Health Level 7 (HL7) messaging standards.

- National Council on Prescription Drug Programs (NCDCP) standards .

- Institute of Electrical and Electronics Engineers 1073 (IEEE1073) series of standards for medical devices interfaced to health information computer systems.

- Digital Imaging Communications in Medicine (DICOM) standards.

- Laboratory Logical Observation Identifier Name Codes (LOINC).

On May 6, 2004, federal agencies participating in the CHI initiative adopted 15 additional standards. The 15 new standards built on the existing set of five standards adopted in March 2003. The specific new standards consisted of:

- Health Level 7 (HL7) vocabulary standards for demographic information, units of measure, immunizations, and clinical encounters, and HL7's Clinical Document Architecture standard for text based reports. (Five standards).

- The College of American Pathologists Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT) for laboratory result contents, non-laboratory interventions and procedures, anatomy, diagnosis and problems, and nursing. HHS has made SNOMED-CT available for use in the U.S. at no charge to users. (Five standards).

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- Laboratory Logical Observation Identifier Name Codes (LOINC) to standardize the electronic exchange of laboratory test orders and drug label section headers. (One standard).

- The Health Insurance Portability and Accountability Act (HIPAA) transactions and code sets for electronic exchange of health related information to perform billing or administrative functions. (One standard).

- The Human Gene Nomenclature (HUGN) for exchanging information regarding the role of genes in biomedical research. (One standard).

- The Environmental Protection Agency's Substance Registry System for non-medicinal chemicals. (One standard).

- A set of federal terminologies related to medications - the Food & Drug Administration's (FDA) names and codes for ingredients, manufactured dosage forms, drug products and medication packages; National Library of Medicine's (NLM) RxNORM for describing clinical drugs; and the Veterans Administration's (VA) National Drug File Reference Terminology (NDF-RT) (One standard).

In 2006, three additional standards were agreed to by the CHI initiative to allow for electronic exchange of clinical information across the federal government. The three new standards build on the existing set of standards adopted in 2003 and 2004. These included:

- Digital Imaging Communications in Medicine (DICOM) standards to enable the exchange of multimedia information.

- Health Level 7 (HL7), SNOMED, the FDA SRS and EPA SRS UNII Codes and RXNORM for the exchange of allergy information.

- Health Level 7 (HL7), International Classification of Functioning and Disability (ICF) and related CHI endorsed vocabularies for the exchange of Clinical Assessments and Disability and Functional Status.

American Health Information Community (AHIC)

U.S. Department of Health and Human Services (HHS) Secretary Michael Leavitt has established the American Health Information Community (AHIC), a group of eighteen government, business, and non-profit organization leaders charged with fostering adoption of interoperable electronic records throughout the country.

See *http://www.hhs.gov/healthit/community/background/*

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West Virginia plans to follow the lead of the federal government and ensure that health IT systems implemented in the state comply with these standards adopted at the national level. For more information on national health IT standards activities of the HHS Office of the National Coordinator for Health Information Technology (ONCHIT) and the Health Information Technology Standards Panel (HITSP) - see http://www.hhs.gov/healthit/standards/activities/ and http://hitsp.org.

1.3　Health Information & Data Exchange Standards

Health Information and Data Exchange Standards lay the foundation for interoperable health IT systems. There are a number of health information standards from many standards development organization (SDO) covering different health care areas. Table 1.1 contains a sub-set of those standards that ought to be adhered to by Medicaid and West Virginia.

Health Information Categories	Standard	Description
Admin & Financial	ASC X12 HIPAA	The Health Insurance Portability and Accountability Act (HIPAA) of 1996 endorses X12N, along with other standards, as the mechanism for EDI used in many administrative and financial health care transactions. See www.x12.org
Clinical Documentation	HL7 v2.x & HL7 v3.x	Health Level Seven (HL7) publishes application protocols for Electronic Data Exchange in health care. See www.hl7.org
	CDA	Clinical Data Architecture (CDA) provides an exchange model for clinical documents, e.g. discharge summaries and progress notes. See www.ansi.org
	CCR	Continuity of Care Record (CCR) includes patient and provider information, insurance information, patient's health status (e.g., allergies, medications, vital signs, diagnoses, recent procedures, etc.), care plans, and the reason for referral or transfer. See www.astm.org

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Imaging	DICOM	Digital Imaging and Communications in Medicine (DICOM) was created by the National Electrical Manufacturers Association (NEMA) to aid the distribution and viewing of medical images such as CT scans, MRIs, and ultrasound. Many other specialty disease societies have adopted this standard. See medical.nema.org
Medication	NCPDP	National Council for Prescription Drug Programs (NCPDP) issues standards for the exchange of prescription-related information that facilitate online prescribing and other pharmacy related programs.

Table 1.1: Health Information & Data Exchange Standards

1.4 Medical Terminology and Vocabulary Standards

All West Virginia health care systems institutions should utilize the following medical terminology and vocabulary standards where appropriate:

Standard	Description
SNOMED CT	Systematized Nomenclature of Medicine Clinical Terms (SNOMED-CT) focuses on standardizing terminology across clinical specialties and sites of care and developing standards in response to the increasing need to document care in a computer-readable format; reliably and reproducibly retrieve and aggregate patient level and population-based data; and transmit data in electronic format. The U.S. government has obtained a free license for the public for the use of SNOMED. SNOMED is an adopted standard in CHI for laboratory results, non-laboratory interventions and procedures, and all diagnoses, problems, nursing, and anatomy. See www.snomed.org.
ICD-9-CM	International Classification of Diseases, Clinical Modification, is published by the World Health Organization. ICD-9-CM is a federally accepted standard for morbidity and mortality coding. The 9th revision is used exclusively in the U.S. and the 10th revision is currently being reviewed and should be used from this point forward. See

	http://www.who.int/classifications/icd/en/.
LOINC	The Laboratory Logical Observation Identifiers Names and Codes (LOINC) database is used for laboratory coding. It contains the usual categories of chemistry, hematology, serology, microbiology, and toxicology, as well as categories for drugs and cell counts found on a complete blood count or a cerebrospinal fluid cell count. LOINC is published by Regenstrief Institute. See www.loinc.org.
CPT-5	Current Procedure Terminology (CPT) codes are published by the AMA. CPT is part of the code set standard selected by HIPAA to describe health care services in electronic transactions, largely for charge capture. See http://www.ama-assn.org/ama/pub/category/3113.html .

1.5   West Virginia State IT Standards

The health IT systems in the state of West Virginia will adhere to the following information technology (IT) guidelines and standards as issued by the West Virginia Office of Technology shown in Table 1.2 – See http://www.state.wv.us/ot/default.cfm?fuseaction=TechStndrds.

Category	Subcategory	Recommendation
Local Area Networks (LANs)	Protocol	Move to TCP/IP version 6.x.
	Network Interface	Any new equipment should be 10/100 mb/s and allow for future upgrades.
	Cabling (minimum)	For new installations, Cat 5 or higher should be used.
Wide Area Networks (WANs)	Protocol	Move to TCP/IP version 6.x.
	Wireless Standard	Adopt the 802.11i standard when it is ratified and adopted by the industry.
Dial-In Networks		Point-to-Point Protocol (PPP) using PAP/CHAP. *All dial-up networks must be isolated from the WVSUN network.*

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E-Mail		• Multi-purpose Internet Mail Extensions (MIME) Format Compatibility. • Simple Mail Transfer Protocol (SMTP). Compliance at Gateway • TCP/IP Compatibility. • Provide GUI interface.
Network Servers	Operating System	Currently supported versions of the Microsoft Windows Operating Systems, Unix or compatible operating systems and other required utilities, such as anti-virus and software management.
Operating Software	Desktop (Client) Operating System	All versions of MS Windows Professional. *Special consideration: LINUX can be considered in order to accommodate special needs or functions.*
	Database Server Database/File Management	ANSI SQL Compliance; Require built-in Open Data Base Connectivity (ODBC).
End-User Tools	Office Software	Must be MS Office (e.g. Word, Excel, PowerPoint) or compatible software (e.g. Open Office).
	Terminal Emulation	VT 100, 320, 3270, or 5250 *[in accordance with host requirements].*

Table 1.2: West Virginia Technology Standards

The West Virginia Office of Technology has also proposed a set of technology standards for the web. It is recommended that all West Virginia Health IT Web Portals and Personal Health Record (PHR) systems/sites should follow these proposed standards and guidelines. See the following links at http://www.state.wv.us/ot/default.cfm?fuseaction=TechStndrds

• Document Text Format
• External Linking and Dynamic Data

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Category	Subcategory	Guidance *[Selected Excerpts]*
ITC Number: ITC-WEB-S-0501	**Accessibility**	The Internet Users Group committee voted to follow Level One guidelines to make all state Web sites accessible. The use of accessibility guideline tools (e.g. Bobby) is encouraged.
ITC Number: ITC-WEB-0502	**Content**	Agency websites should be designed to accommodate cross-links among organizations, programs, projects, and individuals. They should also provide a comprehensive catalog of the agency's publications and products. Sites should also include a key-word searching capability and a site map. Sites should also maintain a consistent look and feel throughout.
ITC Number: ITC-WEB-0503	**Copyrights and Disclaimers**	Proper credit should be given for all copyrighted material. Agency servers and most agency multimedia documents should also carry a Disclaimer of Endorsement and a Disclaimer of Liability.
ITC Number: ITC-Web-0504	**File formats**	Web sites/servers should avoid making information available only in proprietary file formats. Material intended to be 'viewed," read, or browsed online should be prepared in HTML format for text and tables, and GIF or JPEG format for graphics. Portable document formats, such as Adobe Acrobat, should not be used as the primary format unless converting the material to HTML is not feasible.
ITC Number: ITC-WEB-0505	**Privacy, Use of Cookies**	State web sites should have a Privacy Notice with a link prominently displayed on the home page. There should also be a notification to the user that the application utilizes a cookie. It is recommended that the cookie should die at the end of the browser session.
ITC Number: ITC-WEB-0507	**Style/Navigation /Organization**	Contains guidelines on site design, page format, navigation, organization, design, etc. Pages should be compliant with HTML 4.0.

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ITC Number: ITC-WEB-0508	Web graphics	MIME types should be restricted to GIF, TIFF, and JPEG images.

Table 1.3: Proposed West Virginia Technology Standards

1.6   PHR Systems & Consumer Health Information Web Site Standards

In April 2008, it was noted that Health Level 7, a health IT standards group, is near approval of a final set of PHR standards and would like to coordinate its PHR promotion efforts with the AHIC work group.

In June 2008, the Markle Foundation published a set of practices for handling PHR information in Connecting for Health: Common Framework for Networked Personal Health Information. The framework was developed with a work group that included payers, providers, health IT vendors, healthcare publishers and advocates, physician organizations and policy analysts. The group includes Google Health, Microsoft, Intuit, WebMD, Revolution Health, Aetna, AARP, Kaiser Permanente, BCBS, Consumers Union, Robert Wood Johnson Foundation, Dossia, Ingenix, Cisco, and others.

The American Health Information Management Association (AHIMA) is a national non-profit professional association, founded in 1928, dedicated to the effective management of personal health information needed to deliver quality healthcare to the public. They have put together a web site with a set of procedures and forms that should be used to construct a personal health record. See http://www.myphr.com/.

Finally, the Health Information Technology Standards Panel (HITSP) was formed for the purpose of harmonizing and integrating standards that will meet clinical and business needs for sharing information between organizations and systems. The Consumer Empowerment specifications that they have accepted include the Continuity of Care Document (CCD) and more - see http://hitsp.org.

1.7   Certification Commission for Healthcare Information Technology (CCHIT)

In order for care providers to more easily share patients' clinical information held in their particular electronic health record systems, objective criteria needed to be established to certify that an electronic record system meets the basic requirements for data capture and exchange. The Certification Commission for Healthcare Information Technology (CCHIT) now provides these certification and validation services that enable health IT vendors to verify the correctness of their implementations of interoperability standards and key system functions.

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Electronic Medical Record (EMR) Systems

The EMR systems used within West Virginia hospital systems or clinical practice setting must be interoperable and must be certified by the Certification Commission for Healthcare Information Technology (CCHIT), or its successor. See www.cchit.org.

Personal Health Record (PHR) Systems

In July 2008, a special PHR Advisory Task Force gave its recommendations to the CCHIT PHR Work Group. The PHR certification program will be launched in mid-2009. The recommendations of the task force can be found at www.cchit.org/phratf.

1.8   Service Oriented Architecture (SOA) & Health IT Systems

It is recommended that health IT systems in West Virginia follow the standards developed by the SOA Consortium, HL7 and OMG. SOA is an architecture that enables business agility through the use of common services. Inside SOA architecture, services are independent, self-contained, reusable business functions (e.g. eligibility checking) or infrastructure functions (e.g. security). Services can also be combined and orchestrated to automate complex business processes.

The aim for the joint efforts among SOA, HL7 and OMG is to provide a means to realize the full benefits of SOA for HL7 content areas. For organizations implementing a SOA framework, this will provide a means to connect vendor systems within an enterprise and interact with other organizations for sharing patient data, evaluating and paying claims, referrals, etc. HL7 has a Special Interest Group (SOA SIG) working on HL7 v3.x. More detailed information can be found at http://hssp.wikispaces.com/.

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Appendix B: West Virginia State Privacy Principles

West Virginia Executive Branch Privacy Program Principles January 2009

The West Virginia Executive Branch Privacy Program will balance individuals right of privacy against others need and right of access to Personally Identifiable Information (PII). The Privacy Program will be based upon the following six principles, consistent with law and policy:

- **Accountability** – Each Department shall assign roles and responsibilities to ensure application of privacy principles to personally identifiable information (PII).
- **Consent** - Each Department shall provide individuals with a reasonable opportunity to object to the collection, use or disclosure of their Personally Identifiable Information (PII). A Department does not collect, use or disclose PII in a manner inconsistent with its notice, unless it has first obtained the individual's additional consent for the use or disclosure, or if the additional use is required by law.
- **Individual Rights** – When possible, and appropriate, a Department shall rely first on the personally identifiable information (PII) it collects directly from the individual. An individual should be afforded the ability to access and copy his or her PII that a Department acquires or maintains, request an amendment of the information an entity maintains and, if such amendment is not undertaken, request that the information be notated. Departments shall provide appropriate means of individual redress that include, at a minimum, institutional mechanisms to ensure that individuals have a simple and effective way to have their questions answered and concerns addressed.
- **Minimum Necessary and Limited Use** – Departments shall limit the collection, and disclosure of personally identifiable information (PII) to their legal authority. Additionally, Departments should only collect or disclose those elements of PII that are reasonably needed to accomplish a legitimate Departmental objective, except where law or public policy directs otherwise.
- **Notice** – Departments shall be open regarding the authority for collecting personally identifiable information (PII); the purpose of the collection; the location of the entity maintaining the PII; with whom the PII may be shared and why; rights an individual has in PII; and the Department's policies, procedures, standards, and practices with regard to PII.
- **Security Safeguards** – A Department shall implement the appropriate management, operational, physical and technical controls to preserve the privacy, confidentiality, integrity and accessibility of personally identifiable information (PII). The security safeguards shall be designed to protect the PII from (i) anticipated threats or hazards, and (ii) unauthorized access, use or disclosure. In each case, the Department will strive to provide security that is proportional to the sensitivity of the PII being protected, with the greatest effort being focused on protecting PII from a compromise that could result in substantial harm or inconvenience to the individual

Appendix C: MITA Process

Figure X. Medicaid IT Architecture

Medicaid Information Technology Architecture (MITA)

The Medicaid IT Architecture (MITA) is an initiative of the Center for Medicaid and State Operations (CMSO) to establish national guidelines for technologies and processes that can enable improved program administration for Medicaid enterprises. The MITA initiative includes a Framework, processes, and planning guidelines for enabling State Medicaid enterprises to meet common objectives within the MITA Framework, while supporting unique local needs.

The MITA Framework, processes, and planning guidelines are described as follows:
- *MITA Framework* is a consolidation of principles, models, and guidelines that combine to form a template for the states to use to develop their own enterprise architectures.
- *MITA processes* provide guidance for State Medicaid enterprises to use in adopting the MITA Framework through shared leadership, partnering, and reuse of solutions.
- *MITA planning guidelines* help states define their own strategic MITA goals and objectives and develop tailored enterprise architectures that are fully consistent with CMSO expectations.

MITA has the following goals in mind:
- Develop seamless and integrated systems that effectively communicate.
- Achieve common Medicaid goals through interoperability and shared standards.
- Promote an environment that supports flexibility, adaptability, and rapid response to changes in programs and technology.
- Promote an enterprise view that supports enabling technologies aligned with Medicaid business processes and technologies.
- Provide data that are timely, accurate, usable, and easily accessible to support analysis and decision making for healthcare management and program administration.
- Provide performance measurement for accountability and planning.
- Coordinate with public health and other partners to integrate health outcomes within the Medicaid community.

See MITA Web Site - http://www.cms.hhs.gov/MedicaidInfoTechArch/.

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List of MITA Business Area Goals and Objectives

The list is presented in two parts. Section One summarizes general or high level administrative and management goals and objectives that have been discussed within the Bureau. Section Two lists MITA goals and objectives by Business Area.

Section One – High-Level Administrative and Management Goals and Objectives:

Goal: Improve BMS Effectiveness and Efficiency

- Align resources with core business functions.

- Secure necessary resources.

- Establish and provide necessary professional education and training to improve staff performance.

- Develop MMIS Roadmap to support future business needs.

- Implement performance management and measurement principles within BMS.

Goal: Minimize Risk and Maximize Value From Contracted Services and Products

- Streamline and improve procurement business functions.

- Improve project management capabilities.

- Implement performance management and measurement principles.

Goal: Leverage Technology to Enhance Performance and Decision -Making

- Enhance reporting capabilities to allow for more efficient and effective performance monitoring.

- Improve data access, analysis and reporting to support decision -making.

Section Two- MITA Business Area Goals and Objectives:

ID	Candidate List of MITA Business Area Goals and Objectives
OM	**Operations Management**
1.0	Goal: Improve operational efficiency and reduce costs in the healthcare system.
1.1	Document operations management roles, responsibilities and business processes.
1.2	Analyze operations management organization structure to align resources with core business functions.
1.3	Enhance and automate reporting capabilities to measure compliance with operational performance measures.
2.0	Goal: Improve access to information necessary for operations management.
2.1	Enhance cost avoidance capability by improving access to accurate other third party payer information.
2.2	Establish integration with other entities to reduce the redundancy of service and payment.
ME	**Member Management**
3.0	Goal: Enhance ability for members to participate in and exercise responsibility for their personal health choices.
3.1	Explore capabilities to establish and allow member access to a personal health record.
3.2	Provide for automated administration of Healthy Rewards Program.
3.3	Provide for automated administration of personal Health Improvement Plans.
3.4	Empower members by providing access to information and tools that can be used to improve their health.
PG	**Program Management**
4.0	Goal: Enhance the Bureau's ability to analyze the effectiveness of potential and existing benefits and policies.
4.1	Integrate reconciled claims data with clinical data.
4.2	Improve tools and provide training for data analysis to help improve healthcare decision making.
5.0	Goal: Improve consistency of Program Management processes and effective communication of policy.
5.1	Document Program Management roles, responsibilities and business processes.
5.2	Establish reporting capabilities to measure compliance with performance measures.
5.3	Design policy management workflow to ensure alignment of law/regulation, policy, system processing and provider communication.
PM	**Provider Management**
6.0	Goal: Improve provider access to real-time data.
6.1	Enhance provider portal to support clinical decisions and to provide real-time access to cost settlement and rebate data.
6.2	Implement real time access to data based on claim adjudication results.

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ID	Candidate List of MITA Business Area Goals and Objectives
6.3	Integrate automated prior authorization capability to provide real time approval or rejection of prior authorizations.
7.0	Goal: Simplify process for submission of provider information.
7.1	Improve provider enrollment and administration processes.
7.2	Provide capability for online submission of standard forms and reports by providers.
CM	Care Management
8.0	Goal: Improve healthcare outcomes for members.
8.1	Establish access to data from sister-agencies and programs within the Department of Health and Human Resources.
8.2	Improve access to clinical and encounter data.
9.0	Goal: Increase use of evidence based clinical and appropriate services.
9.1	Increase the use of evidence based clinical and appropriate services, including preventive services.
9.2	Provide technical capability for Pay-for-Performance reimbursement model.
CO	Contractor Management
10.0	Goal: Enhance the Bureau's ability to monitor contractor performance against approved measures.
10.1	Establish reporting capabilities to measure contractor compliance with performance measures.
10.2	Create automated functions to establish and monitor corrective action plans for contractors not meeting approved performance measures.
PI	Program Integrity Management
11.0	Goal: Improve effectiveness and efficiency of Program Integrity Management function.
11.1	Analyze Program Integrity Management business area structure to align roles, responsibilities, identify necessary skill sets and appropriately assign resources.
11.2	Improve tools and provide training to automate and streamline investigations and case management.
11.3	Monitor MMIS security and controls.
BR	Business Relationship Management
12.0	Goal: Enhance the security, timeliness and accuracy of data exchanged with authorized and authenticated business partners.
12.1	Document business relationship management roles and responsibilities.
12.2	Standardize processes for data validation and reconciliation.
12.3	Standardize process for capture of report and data exchange requirements.

Appendix D: Office of the National Coordinator
HIT Policy Recommendations on Meaningful Use

Meaningful Use Matrix

Health Outcomes Policy Priorities	Care Goals	2011 Objectives *Goal is to electronically capture in coded format and to report health information and to use that information to track key clinical conditions*	2011 Measures	2013 Objectives *Goal is to guide and support care processes and care coordination*	2013 Measures	2015 Objectives *Goal is to achieve and improve performance and support care processes and on key health system outcomes*	2015 Measures
Improve quality, safety, efficiency, and reduce health disparities	• Provide access to comprehensive patient health data for patient's health care team • Use evidence-based order sets and CPOE • Apply clinical decision support at the point of care • Generate lists of patients who need care and use them to reach out to patients (e.g., reminders, care instructions, etc) • Report to patient registries for quality improvement, public reporting, etc	• Use CPOE for all order types including medications [OP, IP] • Implement drug-drug, drug-allergy, drug-formulary checks [OP, IP] • Maintain an up-to-date problem list [OP, IP] • Generate and transmit permissible prescriptions electronically (eRx) [OP] • Maintain active medication list [OP, IP] • Maintain active medication allergy list [OP, IP] • Record primary language, insurance type, gender, race, ethnicity [OP, IP] • Record vital signs including height, weight, blood pressure [OP, IP] • Incorporate lab-test results into EHR [OP, IP] • Generate lists of patients by specific condition to use for quality improvement, reduction of disparities, and outreach [OP] • Send reminders to patients per patient preference for preventive /follow up care [OP, IP]	• Report quality measures, including: - % diabetics with A1c under control [OP] - % hypertensive patients with BP under control [OP] - % of patients with LDL under control [OP] - % of smokers offered smoking cessation counseling [OP, IP] • % of patients with recorded BMI [OP] • % eligible surgical patients who received VTE prophylaxis [IP] • % of orders entered directly by physicians through CPOE • Use of high-risk medications in the elderly [OP, IP] • % of patients over 50 with annual colorectal cancer screenings [OP]	• Use evidence-based order sets [OP, IP] • Record clinical documentation in EHR [IP] • Generate and transmit permissible prescriptions electronically [IP] • Manage chronic conditions using patient lists and decision support [OP, IP] • Provide clinical decision support at the point of care (e.g., reminders, alerts) [OP, IP] • Report to external disease (e.g., cancer) or device registries [OP (esp. specialists) [IP] • Conduct medication administration using bar coding [IP]	• Additional quality reports using HIT-enabled NQF-endorsed quality measures [OP, IP] • % of all orders entered by physicians through CPOE [OP, IP] • Potentially preventable Emergency Department Visits and Hospitalizations [IP] • Inappropriate use of imaging (e.g. MRI for acute low back pain) [OP, IP] • Other efficiency measure (TBD) [OP, IP]	• Achieve minimal levels of performance on quality, safety, and efficiency measures • Implement clinical decision support for national high priority conditions [OP, IP] • Medical device interoperability [OP, IP] • Multimedia support (e.g. x-rays) [OP, IP]	• Clinical outcome measures (TBD) [OP, IP] • Efficiency measures (TBD) [OP, IP] • Safety measures (TBD) [OP, IP]

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		• Document a progress note for each encounter [OP]	• % of females over 50 receiving annual mammogram [OP] • % patients at high-risk for cardiac events on aspirin prophylaxis [OP] • % of patients with current pneumovax [OP] • % eligible patients who received flu vaccine [OP] • % lab results incorporated into EHR in coded format [OP,IP] • Stratify reports by gender, insurance type, primary language, race, ethnicity [OP, IP]			

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Meaningful Use Matrix

Health Outcomes Policy Priorities	Care Goals	2011 Objectives *Goal is to electronically capture in coded format and to report health information and to use that information to track key clinical conditions*	2011 Measures	2013 Objectives *Goal is to guide and support care processes and care coordination*	2013 Measures	2015 Objectives *Goal is to achieve and improve performance and support care processes and on key health system outcomes*	2015 Measures
Engage patients and families	• Provide patients and families with access to data, knowledge, and tools to make informed decisions and to manage their health	• Provide patients with electronic copy of- or electronic access to- clinical information (including lab results, problem list, medication lists, allergies) per patient preference (e.g., through PHR) [OP, IP] • Provide access to patient-specific educational resources [OP, IP] • Provide clinical summaries for patients for each encounter [OP, IP]	• % of all patients with access to personal health information electronically [OP, IP] • % of all patients with access to patient-specific educational resources [OP, IP] • % of encounters for which clinical summaries were provided [OP, IP]	• Offer secure patient-provider messaging capability [OP] • Provide access to patient-specific educational resources in common primary languages [OP, IP] • Record patient preferences (e.g., preferred communication media, advance directive, health care proxies, treatment options) [OP, IP] • Documentation of family medical history [OP, IP] • Upload data from home monitoring devices [OP]	• Additional patient access and experience reports using NQF-endorsed HIT-enabled quality measures [OP, IP] • % of patients with access to secure patient messaging [OP] • % of educational content in common primary languages [OP, IP] • % of all patients with preferences recorded [OP] • % of transitions were summary care record is shared [OP, IP] • Implemented	• Access for all patients to PHR populated in real time with data from EHR [OP, IP] • Patients have access to self-management tools [OP] • Electronic reporting on experience of care [OP, IP]	• NPP quality measures related to patient and family engagement [OP, IP] • % of patients with full access to PHR populated in real time with EHR data [OP, IP]

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					ability to incorporate data uploaded from home monitoring devices [OP]		

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Meaningful Use Matrix

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Improve care coordination	• Exchange meaningful clinical information among professional health care team	• Exchange key clinical information among providers of care (e.g., problems, medications, allergies, test results) [OP, IP] • Perform medication reconciliation at relevant encounters [OP, IP]	• Report 30-day readmission rate [IP] • % of encounters where med reconciliation was performed [OP, IP] • Implemented ability to exchange health information with external clinical entity (specifically labs, care summary and medication lists) [OP, IP] • % of transitions in care for which summary care record is shared (e.g., electronic, paper, eFax) [OP, IP]	• Retrieve and act on electronic prescription fill data [OP, IP] • Produce and share an electronic summary care record for every transition in care (place of service, consults, discharge) [OP, IP] • Perform medication reconciliation at each transition of care from one health care setting to another [OP, IP]	• Additional public reports using NQF-endorsed HIT-enabled quality measures [OP, IP] • % of transitions where med reconciliation was performed [OP, IP] • % of encounters where fill data accessed [OP] • % of encounters where clinical information is shared with external clinical entities [OP, IP]	• Access comprehensive patient data from all available sources	• Aggregated clinical summaries from multiple sources available to authorized users [OP, IP] • NQF-endorsed Care Coordination Measures (TBD)

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Meaningful Use Matrix

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Improve population and public health	• Communicate with public health agencies	• Submit electronic data to immunization registries where required and accepted [OP, IP] • Provide electronic submissions of reportable lab results to public health agencies [IP] • Provide electronic syndrome surveillance data to public health agencies according to applicable law and practice [IP]	• Report up-to-date status for childhood immunizations [OP] • % reportable lab results submitted electronically [IP]	• Receive immunization histories and recommendations from immunization registries [OP, IP] • Receive health alerts from public health agencies [OP, IP] • Provide sufficiently anonymized electronic syndrome surveillance data to public health agencies with capacity to link to personal identifiers [OP,IP]	• % of patients for whom an assessment of immunization need and status has been completed during the visit [OP] • % of patients for whom a public health alert should have triggered and audit evidence that a trigger appeared during the encounter	• Use of epidemiologic data [OP, IP] • Automated real-time surveillance (adverse events, near misses, disease outbreaks, bioterrorism) [OP, IP] • Clinical dashboards [IP, OP] • Dynamic and Ad hoc quality reports [OP, IP]	• HIT-enabled population measures TBD [OP] • HIT-enabled surveillance measure [OP, IP]

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Meaningful Use Matrix

Health Outcomes Policy Priorities	Care Goals	2011 Objectives	2011 Measures	2013 Objectives	2013 Measures	2015 Objectives	2015 Measures
Ensure adequate privacy and security protections for personal health information	• Ensure privacy and security protections for confidential information through operating policies, procedures, and technologies and compliance with applicable law • Provide transparency of data sharing to patient	• Compliance with HIPAA Privacy and Security Rules and state laws • Compliance with fair data sharing practices set forth in the Nationwide Privacy and Security Framework[1]	• Full compliance with HIPAA Privacy and Security Rules • An entity under investigation for a HIPAA privacy or security violation cannot achieve meaningful use until the entity is cleared by the investigating authority • Conduct or update a security risk assessment and implement security updates as necessary	• Use summarized or de-identified data when reporting data for population health purposes (e.g. public health, quality reporting, and research), where appropriate, so that important information is available with minimal privacy risk	• Provide summarized or de-identified data, when sufficient, to satisfying a data request for pop. health purposes	• Provide patients, on request, with an accounting of treatment, payment, and health care operations disclosures • Protect sensitive health information to minimize reluctance of patient to seek care because of privacy concerns	• Provide patients, on request, with a timely accounting of disclosures for treatment, payment, and health care operations, in compliance with applicable law • Incorporate and utilize technology to segment sensitive data

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[1] The Nationwide Privacy and Security Framework was released by The Department of Health and Human Services in December 2008. It is anticipated that further revisions may be made to this document during the calendar year 2010.

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