

Integrating Pharmacists into

Health Information Exchanges – Update Version

February 9, 2018



**Pharmacy Health Information
Technology Collaborative**



Table of Contents

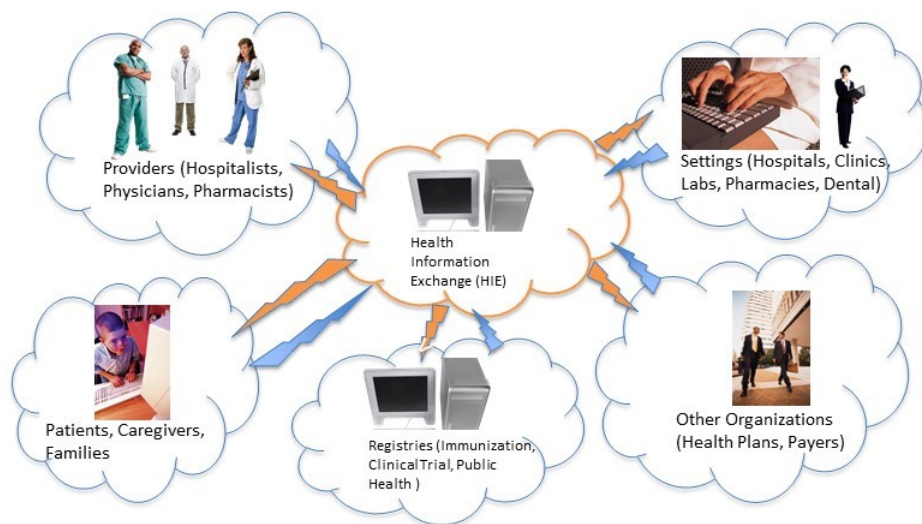
- 1. EXECUTIVE SUMMARY 3
- 2. PURPOSE..... 4
- 3. OVERVIEW 7
- 4. DISCUSSION 12
 - 4.1. THE VALUE OF PHARMACISTS USING HEALTH IT AND HIE..... 12
 - 4.2. NEXT STEPS FOR STRENGTHENING THE PHARMACIST’S ROLE 15
- 5. CONCLUSION..... 15
- 6. APPENDIX: PHARMACISTS’ PROCESS OF CARE..... 17
- 7. REFERENCES.....22
- 8. ACKNOWLEDGEMENTS24

1. EXECUTIVE SUMMARY

The intent of this paper is the importance of educating pharmacists about state and local health information exchanges (HIEs). As the pharmacy profession moves toward providing patient care services, it is critical for pharmacists to electronically collect and share clinical information and medication-related data.

By definition, health information exchange is the sharing of health information electronically across health entities. These exchanges ensure the information being shared remains accurate and readily interpretable. An HIE is the organization “responsible for managing the exchange of the data (the noun) and the process by which the data can be exchanged (the verb)”¹.

Health Information Exchange



This paper will identify barriers that the pharmacy profession needs to address, such as recognition of pharmacists as providers and governance differences between state, regional and local HIEs. The HIE model might be cost prohibitive to small community pharmacies or individual pharmacists to utilize the HIE.

The goal of HIE is to ensure that health care professionals are able to receive and submit clinical information through electronic data exchange within current work processes in the delivery of care for all patients. According to the Office of National Coordinator (ONC) for Health Information Technology's interoperability roadmap, "while the adoption of electronic health record (EHR) systems has seen a dramatic increase in the last five years, the nation has yet to see widespread interoperability between those systems. Health information exchange, however, is occurring in many pockets of the country."²

This HIE process will enable providers to better leverage data to facilitate patient care and therapeutic outcomes. Pharmacists providing patient care services are an important member of the



health care team and must have the ability to electronically exchange health information with other members of the team. Adoption of HIE will integrate the current fragmented efforts of health care providers to enable optimum care as the patient transitions through multiple providers. This integration will help to ensure patient health and safety in a complete system of care that tracks and subsequently guides the provider's patient care decisions. In this continuum-of-care framework, not only are there inherent patient benefits, but also gains for the health system that will complement the national health care initiatives clinically and economically. Additionally, public health organizations will be better equipped to monitor overall health situations and assess regional and national health trends.

Improving the U.S. health care system requires the simultaneous pursuit of three aims: improving the experience of care, improving the health of populations, and reducing per-capita costs of health care. Many initiatives at local, regional, and state levels define and provide regulations regarding the means of electronic exchange of information.

A major challenge that pharmacists face in this new era of electronic health information is to be recognized by Medicare and Medicaid as eligible providers of medication-related patient care services. Dynamic to the changing landscape is the pharmacist's role in these HIEs. In some HIEs, pharmacists are not able to participate because pharmacists are not recognized as eligible providers.

Pharmacists are critical members of the patient's health care team who make meaningful medication management contributions. Pharmacists provide both form and function for HIE efforts at local and national levels. Pharmacists are vital to the health care model and are positioned to provide bidirectional electronic exchange of information that will assure HIE standards and sustainability.

The ONC Interoperability Roadmap states, "Providers are critical to delivery system reform and the transformation to a learning health system. Rigorous training, continuing education and maintenance of certification programs, coupled with decades of advancement and innovation in health care have earned providers the trust of the American public."³ The roadmap mentions pharmacists in the list of providers. The ONC website provides resources addressing what is HIE, HIE benefits, getting started with HIE, and an HIE toolkit.

The appendix section of this document contains information about the differences between some of the state, regional, and local HIEs. Each HIE has different governance, payment models, and provider directories. Some HIEs are government run and others are privately owned, including closed networks.

As the next generation of state HIEs take form, pharmacists' contributions to HIE will be a critical component to the success of sustainable HIE models. There are advancements taking place with registries, such as Prescription Drug Monitoring Programs (PDMP), immunization, antibiotic stewardship, and disaster preparedness, to eventually connect them to HIEs. Pharmacists will play an important role in sending and receiving data to these registries through HIEs and assuring pharmacists are connected is essential to the sustainability of these models.

2. PURPOSE

This paper provides a case for best practices and guidelines to advance optimal pharmacist integration for health information exchange. Adoption and widespread use of HIE will improve patient safety and treatment by ensuring that health information is available to all health care professionals at the point of care. Exchange of health information will, therefore, facilitate coordination of care among physicians, pharmacists, patients, payers, and other health care providers. HIE will ensure more complete patient records, prevent redundant paper work, and increase efficiencies in the



retrieval of records using a query exchange related to patients' medications. Additionally, pharmacists will be able to receive and submit clinical information through electronic data exchange with current processes in the delivery of care for all patients.

In 2014, the pharmacy leaders revised the recommendation and strategies to fit the 2014–2017 Pharmacy HIT Collaborative's Strategic Plan.

2014–2017 PHARMACY HIT COLLABORATIVE'S STRATEGIC PLAN⁴

VISION:

The U.S. health care system is supported by meaningful use of health information technology and the integration of pharmacists for the provision of quality patient care.

MISSION:

To advocate and educate key stakeholders regarding the meaningful use of HIT and the inclusion of pharmacists within a technology-enabled integrated health care system.

GOALS:

Access: Ensure that HIT supports pharmacists in health care service delivery.

Connectivity: Achieve pharmacists' integration within health information exchange.

Quality: Support national quality initiatives enabled by HIT.

PHARMACY HIT COLLABORATIVE'S KEY POINTS

Access–Connectivity–Quality

The updated Pharmacy HIT Collaborative's Roadmap includes these HIE-related goals:

- Ensure that electronic health information is accessible to pharmacists in order to optimize patient care.
- Enhance the ability of pharmacists to electronically determine the need for, document the administration of, and share information into registries about immunizations.
- Encourage pharmacists' active participation in local, state, and regional health information exchanges.

Pharmacists use a person-centered approach to communicate, document, and collaborate in a team-based approach with other health care providers to optimize patient health and medication outcomes.

Using evidence-based practice principles and health information technology (HIT), pharmacists will collect, document, and prepare information for exchange. HIE project teams will need to consider associated workflow changes because the contribution by pharmacists to these exchanges would include:

- Collection of medication-related patient information;
- Assessment of medication-related issues;
- Development of a patient-specific medication plan of care;
- Implementation/Documentation of the medication care plan; and
- Follow up by monitoring of care or patient transition as needed.

See appendix section Figure 1 and diagram for patient care process and outlines the flow of data during the process of care.



It is essential that pharmacists are involved in the bidirectional exchange of clinical information in the delivery of care for all patients. Integrated into this exchange must be health information that is generated by pharmacists as well as other health care providers. Opportunities for strengthening the pharmacist's role in existing programs and policies include ensuring that the pharmacist's contribution is identified in state and regional HIEs, expanding the pharmacist's role in the adoption and use of ONC certified health IT, and ensuring that pharmacists are involved in the bidirectional exchange of clinical information.

In August of 2016, the Office of the National Coordinator (ONC) started an initiative of empowering individuals through interoperable medication lists.⁵ This project demonstrated efforts to standardize the exchange of medication data.

Pharmacists need to be assured that they can collect and exchange information bidirectionally. Using e-prescribing as an example, pharmacists receive prescription information, but if there's a question related to that prescription, the pharmacist still has to either call or send a fax to the prescriber; this is not electronic bidirectional, real-time exchanges of information. Use of HIEs in a bidirectional way can assist pharmacists not only in receiving patient-related information but in exchanging patient-related information. Examples of patient-related information that can be exchanged and integrate pharmacists into HIEs include:

- Allergy adherence and patient history;
- Active medication and inactive medication lists;
- Communicating drug-related problems and their recommended solutions;
- Medication management plans and patient self-care plans;
- Comprehensive medication review patient take-away (Medicare Part D requires a specific format);
- Point-of-care laboratory data;
- Collection of clinical data (e.g., blood pressure, monofilament testing, pulse, weight, body fat percentage);
- Gaps in care reporting (quality); and
- Recommendations for testing, referrals, etc.⁶

Pharmacy and pharmacist-provided patient care services must be included in local, state, and regional HIEs by providing and receiving key clinical and medication information. Pharmacists' integration into HIEs will provide current medication-related data, improve communication among health care team members, improve the overall quality of patient outcomes, improve safety and assist providers in meeting care coordination using ONC certified health IT systems.

RECOMMENDATIONS FOR ACTION

- Continue to meet with the ONC for Health Information Technology, including the federal advisory committees and the Centers for Medicare and Medicaid Services (CMS), to recommend that pharmacists be recognized as eligible providers of medication-related patient care services and meaningful users of and contributors to the EHR.
- Integrate pharmacies and pharmacists into HIEs.
- Ensure that pharmacists in all practice settings are active participants in local, state, and regional HIEs.
- Encourage system vendors to facilitate pharmacist participation in HIEs by developing



effective and efficient software platforms for communicating HIE-gathered information bidirectionally in clear and concise ways.

3. OVERVIEW

The American Recovery and Reinvestment Act of 2009 set ambitious goals for the nation to integrate information technology into health care delivery. The Health Information Technology for Economic and Clinical Health (HITECH) Act segment of the bill establishes a timeline for providing incentives for Medicare and Medicaid providers to use ONC certified health IT systems to achieve specified improvements in health care and implement a nationwide EHR system.

The Pharmacy Health Information Technology Collaborative (PHIT), a group of nine national pharmacy organizations and associate members, advocates integrating the pharmacist's role of providing patient care services into the national HIT interoperable framework. As already stated, a major challenge that pharmacists face in the new era of electronic health information is to be recognized by Medicare and Medicaid as eligible providers of medication-related patient care services and critical members of the patient's health care team and to make meaningful medication management contributions.

Organizations (e.g., Updox, Surescripts, Direct Trust, Commonwell) have for-profit and not-for-profit private HIE networks that connect providers. There are standards these organizations use to assure privacy and security processes are in place. There are emerging efforts to use "blockchain" for privacy and security of systems.⁷

CMS AND ONC INVOLVEMENT

In February 2016, CMS and ONC announced, in a letter to the state Medicaid directors, a plan outlining 90% matching funds to state HIE programs to exchange data on Medicaid patients related to CFR Part 170. Medicaid matching funds are to be used to onboard pharmacists by states that recognize pharmacists as providers. Under this plan, pharmacies and pharmacists are recognized as Medicaid providers and will benefit from this policy change. Two areas from the letter are a primary focus for on-boarding Medicaid providers, including pharmacies and in some states pharmacists, and the use of electronic care plans to support chronic care coordination.

Pharmacies: Similarly, subject to the parameters and cost controls described above, States may claim the 90 percent HITECH match for the costs of supporting the initial on-boarding of pharmacies to HIEs or other interoperable systems, if on-boarding the pharmacies helps Eligible Providers meet Meaningful Use objectives, such as the objectives around sending electronic prescriptions or the objectives around conducting medication reconciliations, both described in 42 CFR 495.22 and 495.24.⁸

Care Plan Exchange: States may claim the 90 percent HITECH match for costs related to the design, development, and implementation of interoperable systems and HIEs that facilitate the exchange of electronic care plans between Eligible Providers and other Medicaid providers, so long as these costs help Eligible Providers meet Meaningful Use, and the cost controls described above are met. Medicaid providers coordinating care across multiple care settings may exchange care plans containing treatment plans and goals, as well as problem lists, medication history and other clinical and non-clinical content added and updated as appropriate by members of a patient's care team, including Medicaid social service providers. States are encouraged to consider care plan exchange for patients with multiple chronic conditions who might be coordinating care between many specialists, hospital(s), long term care facilities, rehabilitation



centers, home health care providers, or other Medicaid community-based providers. Similarly, children in the foster care system might benefit from care plans shared across Medicaid providers (including Eligible Providers) to facilitate coordination of the children's care. As discussed above, costs related to exchanging care plans between Medicaid providers and other programs, such as foster care programs, may need to be allocated between benefitting programs.⁹

This initiative assists the Pharmacy HIT Collaborative's efforts around a pharmacist-provided medication-related electronic care plan to share functional assessments and patient-centered goals of care that meet CMS value-based payment models for chronic care management (CCM). It will help pharmacists be part of documentation in the use of the team-based CPT codes 99490, 99487, 99489, or future codes for CCM, for non-face-to-face care coordination services furnished to Medicare beneficiaries with multiple chronic conditions. Part of the certified EHR or other technology requirement is the "creation of a patient-centered care plan based on a physical, mental, cognitive, psychosocial, functional and environmental (re) assessment and an inventory of resources and supports; a comprehensive care plan for all health issues. Sharing the care plan as appropriate with other practitioners and providers is essential. Must at least electronically capture care plan information; make this information available on a 24/7 basis to all practitioners within the practice whose time counts towards the time requirement for the practice to bill the CCM code; and share care plan information electronically (other than by fax) as appropriate with other practitioners and providers."¹⁰

Summary of CCM service changes for 2017 for certified EHR and other electronic technology requirements are as follows:

- Certified EHR still required to standardize formatting in the medical record of core clinical information (demographics, problems, medications, medication allergies), but certified technology is no longer required for other CCM documentation or transitional care management documents.
- No specific technology requirements for sharing care plan information electronically within and outside the practice, and fax can count, as long as care plan information is available timely (meaning promptly at an opportune, suitable, favorable, useful time).
- Individuals providing CCM after hours no longer required to have access to the electronic care plan, as long as they have timely information.
- Remove standards for formatting and exchanging/transmitting continuity of care document(s).
- Continue to encourage and support the use of certified technology and increased interoperability, but code-level conditions of Medicare Physician Fee Schedule (PFS) payment may not be the best means of accomplishing this. Practitioners are likely to transition to advanced electronic technologies due to incentives of the Quality Payment Program, independent of CCM rules.¹¹

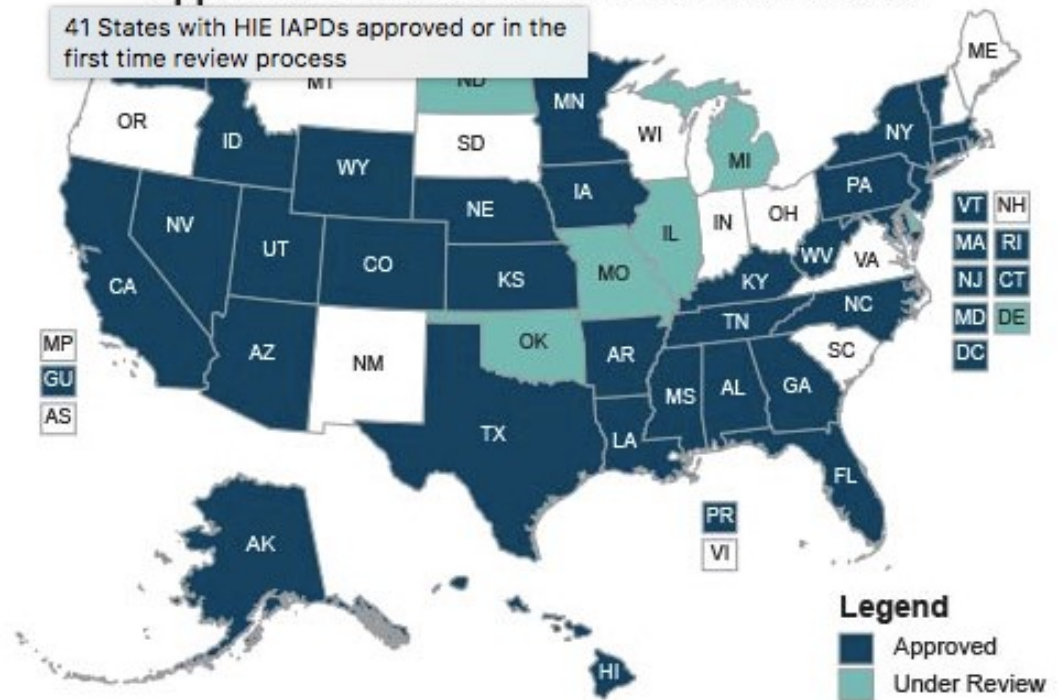
It is essential that state pharmacy associations begin working with their state Medicaid's directors to ensure pharmacies and pharmacists in those states are added to the Medicaid provider directories and have access to the state HIEs through the on-boarding process. There are other impacts to this initiative, such as access by pharmacies and pharmacists to registries (e.g., immunization, antibiotic stewardship, emergency preparedness, clinical trials and more).

The Medicaid.gov website contains updated information on the status of federal financial participation for HIT and HIE.¹² The map below represents states that have HIE Implementation Advanced Planning Documents (HIE IAPDs) approved or are in first time review process.



44 States and Territories with HIE IAPDs Approved or in the First Time Review Process

41 States with HIE IAPDs approved or in the first time review process



Approved HIE/IAPD Activities	Number of Participating States*
Onboarding Providers	30
Public Health	25
HIE Infrastructure	24
HIE Services	23
Planning	18



Approved Sustainability Approaches	Number of Participating States*
Provider Subscriptions	24
Payor Subscriptions	17
State Funding	21
Grants/Donations	8
Other/NA	13

*Updated data as of March 2017

USING HEALTH IT TO MANAGE CHRONIC CARE

Pharmacists play an important role in the integrated health care team for managing medication-related issues of patients with chronic care conditions. During health care visits, patients' medication regimens are often adjusted which may lead to medication danger with unintentional medication discrepancies occurring in 3.4 to 98.2% of patients and medication related problems or adverse drug events in 17.2% to 94.0% of patients.¹³ Too frequently the outcome is patient harm as medication-associated hospitalizations occur at rates of 0.2–41.3%, with a median prevalence of 5.1%.¹⁴ As a national focus grows on the awareness and concern of adverse drug events in the ambulatory setting, pharmacists are in the unique position to assist patients and providers in assuring optimal use of these medications during the transition from the visit to the next level of care and with patient self-management.

Chronic care management team-based models include a pharmacist's use of a person-centered approach to help optimize patients' health and medication outcomes. To do this, pharmacists follow a patient care process¹⁵ that includes collecting, assessing, planning, implementing and following up to ensure patients' meet their individual goals. Pharmacists collaborate with others working on the CCM team (which includes the patient and family) and document their care.

Pharmacists providing patient care services are increasingly participating in new CCM models to ensure that continuity of care occurs. The goal is emphasizing pharmacists shared responsibility with other health care providers for reaching better medication-related outcomes for patients. Under these new care models and during CCM, pharmacists, along with members of the care team including the patient, their family, and other caregivers should focus on person-centered overall outcomes.

It is important that during care transitions, pharmacists receive and/or create a longitudinal person-centered medication related plan of care. The National Partnership for Women and Families has identified the following key principles as part of the vision for person-centered shared care planning:¹⁶

- Health and care plans should be goal-oriented, dynamic tools (not static documents).
- Tools that facilitate health and care planning should enable all members of the care team to securely access and contribute information, according to their roles.
- Health and care plans should identify and reflect the ability and readiness of an individual



(and caregiver) to successfully meet the individual's goals, as well as potential barriers.

- Health and care planning and tools should facilitate decision-making and specify accountability.
- Every individual would benefit from health and care planning and tools.

An electronic standard for exchanging care plans is available in which standard clinical codes (e.g., SNOMED CT) are embedded in the electronic structured Care Plan document. The standards for a shared longitudinal Care Plan for exchange with care providers are described in HL7 Implementation Guide for CDA® (Clinical Data Architecture) Release 2: Consolidated CDA Templates for Clinical Notes (November 2014).¹⁷ NCPDP WG10 Professional Pharmacy Services has developed the [Pharmacist eCare Plan Version 1.0: Guidance on the Use of the HL7 CDA Consolidated Templates for Clinical Notes R2.1 Care Plan](#) "to enable pharmacists to capture their assessments of patient health status and health concerns, mutually defined patient care goals, recommendations, interventions and outcomes and to share them with other care providers, payers and the patient."¹⁸

Pharmacists predominantly share clinical information outside of e-prescribing with physicians by telephone or fax. However, there are pockets where pharmacists are able to interface with physician offices, hospitals and integrated systems that can populate medication-related data in an EHR. Internal communication within a hospital or health system occurs, yet the communication outside the integrated network is, at best, inconsistent.¹⁹ More advanced EHR capabilities are needed to capture and share clinical information through HIE. There is a need to assure various practice settings and patients to have these resources available for consultation and collaboration.

The EHR captures necessary patient data (e.g., medical history, medications, allergies, immunization status, problems/conditions, lab results, radiology images, vital signs, personal stats, and payer information) and supports care-related transactions such as e-prescribing. Optimally, it should also:

- provide a repository of all available patient health information that enables communication to all providers and the patient;
- provide registry and information exchange capabilities to track the care provided to patients at a population level (e.g., dashboards to track population health or predictive analytics);
- provide efficient and effective clinical decision support to help ensure that evidence-based medicine is appropriately delivered to patients and providers (e.g., pharmacogenomics, medical guidelines, etc);
- enable workflow integration for optimal collaboration of care;
- provide resources such as patient portal to make the patient information available, enhance communication between the patient and provider, and make it possible for the entire healthcare team to be connected electronically;
- measure quality and efficiency using agreed-upon performance measures;
- include communication tools and functions that support team-based care; and
- provide real-time notification to the entire healthcare team regarding significant change in health status of patients (e.g., hospital admissions or discharge, ability to support new types of lab results like genetic/pharmacogenetic testing results and proactive clinical decision support for future prescribing, medication changes, etc).



These advanced EHR capabilities range from role-based access, secure messaging with other providers, and fully interoperable exchange of standard electronic documents for consultation and collaboration. The advanced EHRs functionality assists where providers are meeting with a consulting specialist such as a clinician, seeing a patient in the emergency department, or a pharmacist seeing the patient in a community pharmacy for care or consultation.

Patient's personal health records (PHRs) need to provide patients with access to their pertinent data and provide access to a range of personal health management and health information tools, including secure communication with providers and wearable technologies. Robust health information exchange is essential to allow participating providers to routinely share clinical data and communicate with their patients and with each other.

There is increasingly significant access to relevant information and analytics that can draw on clinical, claims, and pharmacy data. This information can provide a foundation for assessing performance, benchmarking against regional norms, delivering timely feedback to participants, and enhancing quality improvements for individual and system performance.

The ultimate goal of implementing health IT is to create connectivity in an interoperable way that allows health information exchange along with integrated workflow, analytics, decision support, and other technology tools that support the health care team. The result of better health information exchange will be that care is better coordinated and delivered more efficiently and effectively over time.

4. DISCUSSION

This section provides further discussion about health information exchanges. The value of pharmacists, in subsection 4.1, is discussed first to demonstrate the value of the pharmacist's role in health care in sharing clinical information electronically with other health care providers. Examples of pharmacists exchanging health information are provided in the case studies in subsection 4.2. Lastly, further steps for strengthening the pharmacist's role in HIE are discussed in subsection 4.3.

4.1. THE VALUE OF PHARMACISTS USING HEALTH IT AND HIE

Research demonstrating the value of the pharmacist's role in health care highlights the importance of the pharmacist's ability to exchange in a bidirectional manner clinical information with other health care providers. The value of the pharmacist's role in health care has been established in a variety of settings, including the following areas of patient care:

- Chronic care management (CCM) models (e.g., diabetes management, Asheville project);
- Medication therapy management (MTM) and care coordination (e.g., ToC);
- Team-based person centered care;
- Outcomes research and quality reporting;
- Population health (e.g., precision medicine, predictive analytics);
- Preventative care (e.g. annual wellness visits, immunizations); and
- Workforce development (e.g., pharmacists who are working or training others in these roles).



In 2014, an Avalere whitepaper validated the above points related to the value of pharmacists.²⁰

The 2011 Surgeon General's Report, *Improving Patient and Health System Outcomes Through Advanced Pharmacy Practice*, comprehensively shows the value of pharmacists in providing these services. A pivotal piece of the successful use of pharmacists' knowledge and skills includes their continued efforts to leverage HIT in the care of the patient. HIT has long been recognized as a key means for supporting improvements in health care quality, safety, and efficiency. With the passage of the HITECH Act in 2009, many health care collaborations were formed to support and advance HIT to the fullest extent. According to the Patient-Centered Primary Care Collaborative, HIT "can provide critical information about the patient to the entire care coordination team across all stages of care, support physician-patient communication, enable more timely and accurate performance measurement and improvement, and improve accessibility of the physician practice to the patient."²¹

In May 2016, Terry McInnis, MD, and Katherine Capps published their research "Get the medication right: a nationwide snapshot of expert practices; Comprehensive medication management in ambulatory/community pharmacy", which highlighted 15 high-functioning pharmacist patient care practices out of 935 practices from their environmental scan. In the report, the authors describe the value and acceptance of these services by other health care providers and the importance of providing these services in the new alternative payment models. They conclude that comprehensive medication management provided by pharmacists improves patient clinical outcomes, delivers lower health care utilization and overall costs, contributes to patient satisfaction and maximizes the training and skill of clinical pharmacists.²²

Currently, there are some pilot projects in progress demonstrating the value of pharmacists' services improving patients' quality of care. These projects utilize the exchange of health IT data to improve patient outcomes, but require significant payment structure changes to remain economically viable and sustainable. A Population Health Advisor (PHA) paper, *Integrated Pharmacy Models in Primary Care*, outlines five significant examples of how Centers for Medicare and Medicaid Innovation (CMMI) can impact patient outcomes, but the authors of the paper stated payment parity with other providers for sustainability should be ultimately required. The five organizations profiled in the paper represent integrated pharmacy models ranging from geographic location, patient population, and program scale. The paper provides an overview of each of the organizations and looks at each organization's approach to the following:

- Staffing and deployment;
- Patient eligibility and referral processes;
- Patient and provider engagement strategies;
- Care coordination processes;
- Performance metrics and outcomes; and
- Financial considerations.

The PHA paper recommends steps for implementing best practice models for an integrated pharmacy program.²³

The pharmacy profession has traditionally been an early adopter of HIT and recognizes the benefits of HIT in optimizing patient care and outcomes-based measurement. In 2010, nine national pharmacist associations formed the Pharmacy HIT Collaborative to focus on and ensure that the technology needs of the pharmacy profession advance with the federally incentivized progression of HIT infrastructure in the United States. In 2014, the Collaborative published a [Roadmap for Pharmacy](#)



[Health Information Technology Integration in U.S. Health Care 2014-2017](#) document. This roadmap is a revised version of the [Collaborative's 2011-2015 Roadmap](#). It provides guidance to provider organizations, policymakers, vendors, payers, and other stakeholders striving to integrate pharmacy HIT into the national HIT infrastructure. The revisions align the roadmap to the Collaborative's [2014-2017 strategic plan, vision, and mission](#).

The Collaborative is pursuing health IT standards that support the delivery, documentation, revenue generation, and quality measures through value-based payment models for pharmacist-provided patient care services across all care settings. Thus, the pharmacy profession has already realized the clinical utility of electronic health data and has positioned itself ahead of the curve for standardized outcomes-related data collection and enhanced electronic data accessibility for delivering quality patient care services.²⁴

Under collaborative practice agreements, pharmacists work in collaboration with physicians and primary care clinicians to help patients, particularly those with chronic conditions, manage and optimize their medication regimens. On July 6, 2016, "the Collaborative Practice Workgroup, convened by the National Alliance of State Pharmacy Associations (NASPA), developed recommendations for what elements of pharmacist collaborative practice authority should appropriately be defined under state law and regulation and what elements are best left to be determined between pharmacists and other practitioners when developing their specific collaborative practice arrangement."²⁵ The National Association of Boards of Pharmacy (NABP) defined elements that should be part of collaborative practice agreements. Those elements are:

- Identification of the Practitioner(s) and Pharmacist(s) who are parties to the Agreement
- Types of decisions the Pharmacist is allowed to make;
- A method for the Practitioner to monitor compliance with the Agreement and clinical outcomes and to intercede when necessary;
- A description of the Continuous Quality Improvement Program used to evaluate the effectiveness of patient care and ensure positive patient outcomes;
- A provision that allows the Practitioner to override a Collaborative Practice decision made by the Pharmacist whenever he or she deems it necessary or appropriate;
- A provision that allows either party to cancel the Agreement by written notification; An effective date; and
- Signatures of all collaborating Pharmacists and Practitioners who are party to the agreement, as well as dates of signing.²⁶

In March 2017, NASPA and the National Association of Boards of Pharmacy (NABP) developed key elements for statewide pharmacist protocols to be included in state laws and regulations authorizing such authority.²⁷ In support of such protocols, "Center for Medicaid and CHIP Services (CMCS) recognizes that states continue to look for innovative tools to address pressing public health issues, such as the opioid epidemic or preventing influenza infections. State flexibilities in expanding the ability of pharmacists to prescribe, modify, or monitor drug therapy for certain medications may be effective at helping to address such issues by improving access to care. CMCS encourages states to consider using these methods to promote access particularly to those drugs that can help address priority public health issues."²⁸



4.2. NEXT STEPS FOR STRENGTHENING THE PHARMACIST'S ROLE

Integral to this optimal model of health care, a patient's health information must be generated by an interprofessional patient-centered approach. Opportunities for strengthening the pharmacist's role in existing programs and policies include ensuring that the pharmacist's contribution is identified in state and national HIEs, expanding the pharmacist's role in the adoption and meaningful use of the EHR through the use of the pharmacist's EHR functional profile,²⁹ and ensuring that pharmacists are involved in the bidirectional exchange of clinical information.

Organizations have EHR teams or business analysts that make decisions that may impact clinical care. Pharmacists are often not involved in making those decisions unless they actively become members of those teams. Pharmacists are encouraged to become involved in the following ways at the organizational level within their technology teams:

- Meet with the ONC, as well as the federal advisory committees and CMS, to recommend that pharmacists be recognized as eligible providers of medication-related patient care services and meaningful users of and contributors to the EHR;
- Integrate pharmacies and pharmacists into HIEs;
- Ensure that pharmacists in all practice settings are active participants in local, state, and regional HIEs;
- Encourage system vendors to facilitate pharmacist participation in HIEs by developing effective and efficient software platforms for communicating HIE-gathered information bidirectionally in clear and concise ways; and
- Promote engagement in further certification, credentialing, education and training in informatics as those opportunities continue to develop.

E-prescribing models of HIE are successful in "pushing" prescription information from the prescriber to the pharmacist, but they don't allow for bidirectional clinical exchange in which the pharmacist can communicate with the prescriber. Increased pharmacist participation at organizational levels will be key to the development of increasing bidirectional clinical exchange and the pharmacist's role in EHR use.

5. CONCLUSION

Health information exchange is no longer just an option. It is critical, clinically and economically, to the pharmacy profession and to the health care system. To facilitate the pharmacist's role in the new era of electronic health information, it is important for pharmacists to be recognized by Medicare and Medicaid as eligible providers of medication-related patient care services and as critical members of the patient's health care team.

Although strides have been made, the current state of patient care remains fragmented with no standard method of communication among a patient's multiple health care providers. Communication is internal in a primarily vertical manner, and horizontal external communication is, at best, inconsistent. Best practice guidelines presented in this paper include pharmacists practicing within a bidirectional electronic exchange of health information, leading to a complete collection of information necessary to assess the patient's overall medication plan and improve health outcomes. By providing a more complete picture of the patient's health profile, this exchange will positively affect the following:

- Optimal identification and resolution of drug-related problems (DRPs)



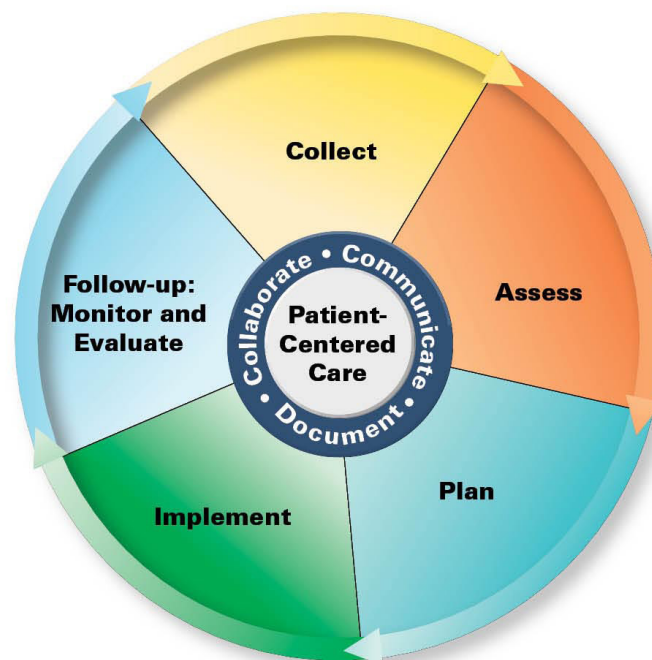
- o Drug–drug interactions and therapy duplication
- Gaps in care
 - o Adherence and therapy omissions
 - o Allergic reactions and subsequent patient harm
- Duplicative testing
- Accurate and current medication lists
- Confusion among health care providers and patients;

Real-time HIE guarantees timely and secure access to the information necessary for the optimal care of individual patients by all health care providers. The professional climate is currently positioned to support these exchanges and the pharmacist’s collaborative role in a patient-centric care model. Pharmacists’ responsibilities in optimizing medication use, medication management, medication dispensing, patient health monitoring, and the provision of medication and disease education uniquely position them to collaborate fully with the entire patient care team and ensure that the health and safety of the patient are well represented.

6. APPENDIX

Standardized Pharmacist Person-Centered Collaborative Care Process

Figure 1 below depicts a proposed standardized pharmacist person-centered collaborative care process for pharmacists providing medication therapy management (MTM) services. The pharmacists' patient care process described in this illustration was developed by examining a number of key source documents on pharmaceutical care and MTM. Patient care process components in each of these resources were catalogued and compared to create the following process that encompasses a contemporary and comprehensive approach to patient-centered care that is delivered in collaboration with other members of the health care team.³⁰



Pharmacists' Patient Care Process

Pharmacists use a patient-centered approach in collaboration with other providers on the health care team to optimize patient health and medication outcomes.

Using principles of evidence-based practice, pharmacists:

Collect

The pharmacist assures the collection of the necessary subjective and objective information about the patient in order to understand the relevant medical/medication history and clinical status of the patient.

Assess

The pharmacist assesses the information collected and analyzes the clinical effects of the patient's therapy in the context of the patient's overall health goals in order to identify and prioritize problems and achieve optimal care.

Plan

The pharmacist develops an individualized patient-centered care plan, in collaboration with other health care professionals and the patient or caregiver that is evidence-based and cost-effective.

Implement

The pharmacist implements the care plan in collaboration with other health care professionals and the patient or caregiver.

Follow-up: Monitor and Evaluate

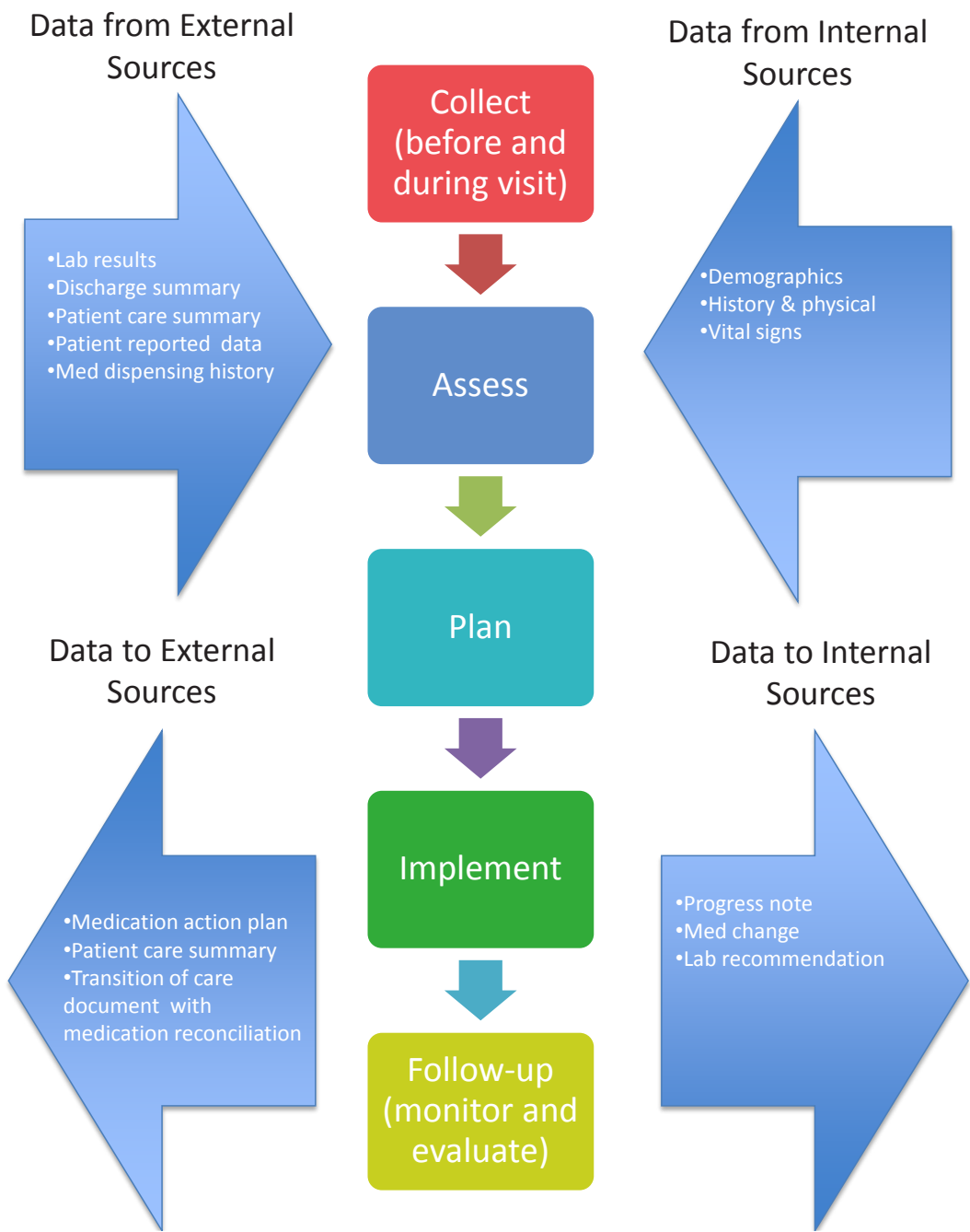
The pharmacist monitors and evaluates the effectiveness of the care plan and modifies the plan in collaboration with other health care professionals and the patient or caregiver as needed.



This diagram outlines the flow of data during the process of care.³¹

Pharmacists' Clinical Documentation Data Flow

Ambulatory Clinic Setting





National Association of State Pharmacy Associations (NASPA) Update

This table (provided by NASPA) and the following material outlines information pertaining to HIE activity. The information includes state or private HIEs. Some of the information has pharmacy involvement and some don't. This is not an inclusive list.

HIE Initiatives	Description	Resources
Colorado Initiative	<i>To fully develop these business use cases for CORHIO services, workflow sometimes needs to be changed and tested. To do so effectively, it is helpful to include low adoption or new participant types from Colorado's healthcare community – such as pharmacists. Pilot results will be documented and shared openly to continue our history of transparency and enable cross promotion within the provider community.</i> <i>CORHIO's participation fees will be waived for the duration of this pilot for up to 12 pharmacists during the pilot period.</i> <i>Pilot Goals: Desired outcomes achieved will not only help develop new care process options for pharmacists but also help market CORHIO services and increase HIE adoption by various healthcare professionals.</i>	Katy Brown PharmD, Clinical Pharmacy Specialist Medication Safety and Adverse Drug Event Prevention Telligen, Inc. (515) 453-8124 work, (712) 299-6850 cell katy.brown@area-d.hcqis.org www.telligenqinqio.com http://www.corhio.org/
Iowa initiative	<i>Iowa Pharmacy Association (IPA) has been working on an initiative over the last few months that provided pharmacies access to our state-based HIE. IPA received a waiver from the Board of Health, so fees were not assessed as they worked through the pharmacy-based issues with the HIE. The pilot continued into 2016 with new conversations starting with software vendors to better upload pharmacy data (HL7-ready) into the HIE.</i>	Anthony Pudlo apudlo@iarx.org, http://www.iowahealth.org/documents/news/6.pdf
North Carolina Initiative	Medication reconciliation improves safety, quality Pharmacy Home PHARMACeHOME Tool To fully	https://www.communitycarenc.org/informatics-center/pharmacy-home



HIE Initiatives	Description	Resources
Ohio Initiative	<i>The statewide HIE, Clinsync, voted to allow pharmacists to both read and write to their HIE. According to Ernest Boyd, as of August 2016, Kroger pharmacies were connected with Clinsync.</i>	<i>Ernest Boyd, eboyd1930@icloud.com</i>
Tennessee Initiative	The Office of eHealth has developed a two-lane strategy for developing a statewide network for health information exchange (HIE). First, is the development of public and private health information exchanges (HIEs) across systems, communities, and geographic regions. These smaller HIEs could then connect to one another so that they could electronically communicate and exchange health care information, as required, forming a state-wide network of exchanges. Hospitals and health care providers that have adopted electronic health records (EHRs) could transmit and update their patients' health information by electronically communicating with other health care providers over these HIE networks. The goal is to have all HIE networks interoperable across the state so that providers for any patient in Tennessee could have immediate electronic access to all their health care records from their entire health care team regardless of their physical location. Second, is to support DIRECT technology for HIE. Direct technology is an 'email-like' messaging system that can transmit health care information between two entities that both have DIRECT addresses. The DIRECT messaging system is more secure than regular email because the information included in DIRECT messages is encrypted until opened by the intended recipient. Medication reconciliation improves safety, quality Pharmacy Home PHARMACeHOME Tool	https://www.tn.gov/ehealth/section/health-information-exchange

Evaluation of the State Health Information Exchange Cooperative Agreement Program: Case Study Synthesis: Experiences from States in Enabling HIE

This is what the site states now:



EVALUATION OF THE STATE HEALTH INFORMATION EXCHANGE (HIE) COOPERATIVE AGREEMENT PROGRAM

NORC has been awarded a contract from the Office of the National Coordinator for Health IT (ONC) to conduct an evaluation of the State Health Information Exchange Cooperative Agreements Program.

This table (provided by NASPA) and the following material outlines information pertaining to HIE activity. The information includes state or private HIEs. Some of the information has pharmacy involvement and some don't. This is not an inclusive list.

In addition to these evaluation efforts, NORC is also responsible for providing evaluation-related technical assistance to states in designing and implementing the states' evaluation plans.³²

Planning and Implementing a Health Information Exchange Network: A Guide for State Designated Entities

Health care reform is being pushed aggressively to the top of the federal government's agenda. The significant funding provided through the American Recovery and Reinvestment Act (ARRA) offers an opportunity to start to build a national infrastructure for health information exchange that will open the door to new efficiencies in the health care system, better access to health care and overall improved quality of health for citizens.³³

Sustaining State Health Information Exchange: A State Toolkit

Without significant innovation, the United States will continue paying more than other industrialized countries for poorer health outcomes and inadequate access to quality of care. The health care industry is plagued by fragmented data throughout the sector and a lack of reliable information and analytics for making decisions and policy. The U.S. health care sector compares poorly with other industrialized countries on both care quality and cost. The United States leads in health care expenditures but lags on measures of health care quality, access, efficiency, equity, and the adoption of health information technology (HIT) policies. The systematic exchange of health information is essential to improving health outcomes, care quality, and slowing the growth of health care costs. The term "health information exchange" (HIE) refers to the electronic movement of health-related information among organizations such as health care providers, public health agencies, and payers, according to nationally recognized standard.³⁴

The Expanding Role of Pharmacists in a Transformed Health Care System

*Pharmacists practice in a variety of health care settings. Although they are most often associated with dispensing medications in retail pharmacies, their role is evolving to include providing direct care to patients as members of integrated health care provider teams. The critical role that medication management plays in treating chronic diseases suggests that the integration of pharmacists into chronic-care delivery teams has the potential to improve health outcomes. Studies of pharmacists providing medication therapy management (MTM) services to improve therapeutic outcomes indicate that such services can improve outcomes and reduce costs. Pharmacists typically provide those services in interdisciplinary teams through collaborative practice agreements (CPAs). Such agreements with other health care providers allow a licensed provider to refer patients to a pharmacist and delegate the delivery of clinical services under supervision. Several key challenges and barriers, however, prevent the full integration of pharmacists into health care delivery teams: restrictive laws and regulations governing CPAs, lack of provider recognition in federal and state law governing compensation of pharmacists who provide direct patient-care services, and limitations on pharmacists' ability to access health information system.*³⁵



7. REFERENCES

1. *What's in a Name? Breaking Down Health Information Exchange, One Definition at a Time*, AHIMA, http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_049630.hcsp?dDocName=bok1_049630, accessed October 1, 2017.
2. *Connecting Health and Care for the Nation A Shared Nationwide Interoperability Roadmap, Final Version 1.0*, <https://www.healthit.gov/sites/default/files/hie-interoperability/nation-wide-interoperability-roadmap-final-version-1.0.pdf>, accessed October 1, 2017.
3. Ibid, page 46.
4. *The Roadmap for Pharmacy Health Information Technology Integration in U.S. Health Care: 2014 to 2017 Update*, http://www.pharmacyhit.org/pdfs/RoadmapUpdate_2015.pdf, accessed October 1, 2017.
5. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0a-hUKewjJj6qn0JDTAhVDwGMKHAA1Ca0QFggxMAM&url=https%3A%2F%2Fonprojecttracking.healthit.gov%2Fwiki%2Fdownload%2Fattachments%2F22380714%2FMed%2520List%2520Goals%2520Call%252002%252009%25202017%2520Final.pdf%3Fapi%3Dv2&usq=AFQjCNFa0th4iAGL-ndd1MbevRuUNurEMxA&bvm=bv.152174688,bs.2,d.eWE>, accessed October 1, 2017.
6. *Integrating Pharmacists into Health Information Exchanges*, <http://www.pharmacyhit.org/pdfs/workshop-documents/WG3-Post-2014-02.pdf>, accessed October 1, 2017.
7. Kevin Peterson, Rammohan Deeduvanu, Pradip Kanjamala, and Kelly Boles Mayo Clinic, *A Blockchain-Based Approach to Health Information Exchange Networks*, <https://www.healthit.gov/sites/default/files/12-55-blockchain-based-approach-final.pdf>, accessed October 1, 2017.
8. <https://www.medicaid.gov/federal-policy-guidance/downloads/SMD16003.pdf>, accessed October 1, 2017.
9. Ibid.
10. <https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLN-Products/Downloads/ChronicCareManagement.pdf>, accessed October 1, 2017.
11. <https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLN-Products/Downloads/ChronicCareManagementServicesChanges2017.pdf>, accessed October 1, 2017.
12. <https://www.medicaid.gov/medicaid-chip-program-information/by-topics/data-and-systems/federal-financial-participation-for-hit-and-hie.html>
13. Lehnbohm EC, Stewart MJ, Manias e, et.al., "Impact of Medication Reconciliation and Review on Clinical Outcomes." *Annals of Pharmacotherapy*, 2014; 48(10) 1298–1312.
14. "Prevalence of adverse drug events in ambulatory care: a systematic review," *Annals of Pharmacotherapy* 2011;45(7–8):977–89.
15. Joint Commission Pharmacy Practitioners Pharmacists' Patient Care Process, https://www.accp.com/docs/positions/misc/JCPP_Pharmacists_Patient_Care_Process.pdf, accessed October 1, 2017.
16. *Care Plans 2.0, Consumer Principles for Health and Care Planning in an Electronic Environment*, November 2013, <http://www.nationalpartnership.org/research-library/health-care/HIT/consumer-principles-for-1.pdf>, accessed October 1, 2015.
17. HL7 Implementation Guide for CDA® Release 2: Consolidated CDA Templates for Clinical



Notes, http://www.hl7.org/implement/standards/product_brief.cfm?product_id=379, accessed October 1, 2017.

18. <http://www.ncdp.org/Resources/Guidance-Documents>, accessed October 1, 2017.
19. *Pharmacists inch closer to accessing EHRs and HIEs*, [http://www.pharmacytoday.org/article/S1042-0991\(16\)30174-8/fulltext](http://www.pharmacytoday.org/article/S1042-0991(16)30174-8/fulltext), accessed October 1, 2017.
20. <http://avalere.com/expertise/life-sciences/insights/exploring-pharmacists-role-in-a-changing-healthcare-environment>, accessed October 1, 2017.
21. <https://dcp.psc.gov/OSG/pharmacy/documents/2011AdvancedPharmacyPracticeReportto-theUSSG.pdf>, page 37, accessed, October 9, 2017.
22. McInnis, T.; Capps, K., *Get the medications right: a nationwide snapshot of expert practices—Comprehensive medication management in ambulatory/community pharmacy*. Health2 Resources, May 2016; http://0104.nccdn.net/1_5/20d/3c1/203/GetTheMedicationsRight.v22final-5.20.pdf, accessed September 2017.
23. <https://www.advisory.com/research/population-health-advisor/white-papers/2014/integrated-pharmacy-models-in-primary-care>, accessed October 1, 2017.
24. <http://avalere.com/expertise/life-sciences/insights/exploring-pharmacists-role-in-a-changing-healthcare-environment>, accessed October 1, 2017.
25. <https://naspa.us/resource/cpa-report>, accessed October 1, 2017.
26. *Collaborative Drug Therapy Management and Comprehensive Medication Management-2015*, American College of Clinical Pharmacy, Pharmacotherapy 2015;35(4):e39–e50 doi: 10.1002/phar.1563.
27. <https://naspa.us/resource/swp/>, accessed October 1, 2017.
28. <https://www.medicaid.gov/federal-policy-guidance/downloads/cib011717.pdf>, accessed October 1, 2017.
29. http://www.hl7.org/implement/standards/product_brief.cfm?product_id=262, accessed October 1, 2017.
30. <https://jcpp.net/wp-content/uploads/2016/03/PatientCareProcess-with-supporting-organizations.pdf>, accessed October 1, 2017.
31. <http://www.pharmacyhit.org/pdfs/workshop-documents/WG3-Post-2014-03.pdf>, accessed October 1, 2017.
32. [http://www.norc.org/Research/Projects/Pages/evaluation-of-health-information-exchange-\(hie\)-cooperative-agreement-program.aspx](http://www.norc.org/Research/Projects/Pages/evaluation-of-health-information-exchange-(hie)-cooperative-agreement-program.aspx), accessed October 1, 2017.
33. https://www.accenture.com/t20150523T042526_w_/il-en/acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Industries_16/Accenture-Planning-and-Implementing-a-Health-Information-Exchange-Network-A-Guide-for-State-Designated-Entities.pdf, accessed October 1, 2017.



8. ACKNOWLEDGEMENTS

The following representatives of the Pharmacy HIT Collaborative Work Group, which is devoted to Communication Standards, developed this document, “Integrating Pharmacists into Health Information Exchanges – Update Version”:

COORDINATOR

Shelly Spiro, Executive Director, Pharmacy HIT Collaborative

AUTHORS

Beth Breeden, representing ASHP

Clark Kebodeaux, representing AACP

Elizabeth Brusig, representing AMCP

Mary Ann Kliethermes, representing ASHP

James A. Owen, representing APhA

Rebecca Snead, representing NASPA

Mehdi Namil, representing APhA

Sandra Leal, representing ACCP

Alexis Platt, representing APhA

Cortney Mospan, representing APhA

RA Pam Schweitzer, CMS Observer

Tricia Lee Wilkins, representing AMCP

ADVISORS

Larry Kelly, representing ASCP

Thomas Felix, representing Amgen

David Pope, representing NCPA

Nicole Russell, representing NCPDP

Sammuel Anderegg, representing Pharmacy HIT Collaborative

Nancy Seroski, representing APhA

Vibhuti Arya, Observer

Michelle Ketcham, CMS Observer

Stephanie Hammonds, Observer

Özlem Ersin, Observer

Scott Fannin, representing Updox