Interoperability of Communications Among Health Care Providers to Improve Quality of Patient Care

Background Paper Prepared for the 2014–2015 APhA Policy Committee
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Issue

The American Pharmacists Association (APhA) Board of Trustees has directed the 2014–2015 Policy Committee to recommend policy to the APhA House of Delegates related to the interoperability of communications among health care providers to improve quality of patient care. The Board’s guidance on this topic included, but was not limited to, real-time pharmacist access to patient information, bidirectional communication protocols that include pharmacists, impact on patient safety through the use of electronic prescribing, and standardized training and qualifications for using electronic prescribing systems.

Summary of Key Concepts

- The lack of real-time pharmacist access to patient information prevents proper, timely, and comprehensive patient care from occurring and creates a gap in communication with the rest of the health care team.
- Improvement in patient safety or health care practices may be found with the usage of bidirectional communication systems between all members of the health care team.
- Correct use of electronic prescribing systems can enhance patient care and streamline communication between the pharmacy and other members of the health care team, particularly prescribers.
- Communication errors through electronic prescribing systems continue to exist without universal standards for training and/or qualifications in place.
- The lack of system interface between various electronic prescribing systems increases the potential for errors and causes the need for extra time to correct the error at the pharmacy level.
- Use of newer technologies, such as web-based systems for patient and healthcare provider access, may improve the quality of patient care and improve transitions of care.
- E-Rx systems must be built with the same standards in mind, and they must be integrated into electronic health records (EHR) systems and state-based databases.
- Pharmacists could play a much more active role in the continuity of care for patients and offer more disease state or medication management services with access to relevant patient health information.

Background

Definition

According to the Healthcare Information Management Systems Society (HIMSS), the definition of “interoperability” is multifaceted. On the highest level, HIMSS describes interoperability as the ability of different information technology systems and software applications to communicate, exchange data, and use the information that has been exchanged. In the expanded definition, HIMSS cites the American Academy of Family Physicians as stating that data exchange should be shared across clinicians, laboratories, hospitals, pharmacies, and patients regardless of the application or application vendor.
HIMSS also states that three levels of health information technology interoperability exist: foundational, structural, and semantic. Each level has varying functionality; the goal of the semantic level is full information access and interpretation. The three levels of interoperability are defined as follows:

1. **Foundational** interoperability allows data exchange between information technology systems but does not require the receiving information technology system to be able to interpret the data.

2. **Structural** interoperability is an intermediate level that defines the structure or format of data exchange (i.e., the message format standards) where there is uniform movement of health data from one system to another such that the clinical or operational purpose and meaning of the data is preserved and unaltered. Structural interoperability defines the syntax of the data exchange. It ensures that data exchanges between information technology systems can be interpreted at the data field level.

3. **Semantic** interoperability provides interoperability at the highest level, which is the ability of two or more systems or elements to exchange information and to use the information that has been exchanged. Semantic interoperability takes advantage of both the structuring of the data exchange and the codification of the data, including vocabulary, so that the receiving information technology systems can interpret the data. This level of interoperability supports the electronic exchange of health-related financial data, patient-created wellness data, and patient summary information among caregivers and other authorized parties. This level of interoperability is possible via potentially disparate EHR systems, business-related information systems, medical devices, mobile technologies, and other systems to improve wellness, as well as the quality, safety, cost-effectiveness, and access to health care delivery.¹

**Current Health Care Information Technology Landscape**

The current landscape of health care information technology (HIT) is evolving at a rapid pace. The effects are noticeable in every aspect of the health care continuum including pharmacy. Meaningful use standards and the EHR Incentive Program through the Centers for Medicare & Medicaid Services (CMS) are expanding physician practice and hospital usage of electronic patient information. In 2011, 57,000 eligible professionals and more than 800 hospitals successfully attested to Stage 1 meaningful use.² More than 487,000 eligible professionals, eligible hospitals, and critical access hospitals were actively registered as of July 31, 2014.³ An increase of about 430,000 users at the Stage 1 level of meaningful use in just 3 years highlights the increasing utilization of electronic patient records. These incentives unfortunately do not provide direct funding to pharmacists or pharmacies to enhance pharmacy-specific electronic medical record technology.⁴ However, pharmacy schools may receive grants for incorporating electronic personal health technology into clinical education.⁵

A fundamental part of the expansion for meaningful use standards is the national expansion of health information exchanges (HIEs). Through the Office of the National Coordinator for Health Information Technology (ONC), funding was awarded to states, eligible territories, and qualified state-designated entities to construct HIEs under the Cooperative Agreement Program. As of 2011, all 56 entities have received an award to implement their plan.⁶ These HIE networks will serve as access ports for the communication of patient information across the health care system both within and across states. The ONC hopes to create a nationwide interoperable health information infrastructure by building upon work within each state. A document describing the 10-year vision for interoperability highlights the ONC’s plan to reach this nationwide HIE.⁷

Electronic prescribing (e-prescribing) has played a direct role in the day-to-day operations of pharmacies regardless of setting. Surescripts, one of the largest health information networks in the United States, reports that it alone connects 95% of pharmacies in the country with 73% of office-based physician practices.⁸ Just 10 years ago, only 4% of office-based physicians utilized their e-prescribing software.⁹ This information confirms that the use of e-prescribing technology is increasing across the country by both pharmacists and physicians. The capability of e-prescribing technology is also expanding beyond the
communication of electronic prescriptions. Add-ons to basic e-prescribing functionality include connection to immunization registries, inclusion of medication decision support systems, integration into an EHR, and communication of prior authorization requests.9-11

Another important aspect of the HIT landscape is the transformation of health care delivery. Patient-centered and value-based models utilizing the health care team benefit from shared access to patient information and bidirectional communication.12 A report from the ONC states, “These new initiatives include accountable care organizations, bundled payments, health and medical homes, and reductions in payment for hospital readmissions.”12 As the advancement of technology continues, health care practitioners will benefit from access to patient information within these models. Access to patient health information for pharmacists will become ever more important as the scope of pharmacy practice expands to include advanced patient care services.

Pharmacy’s Position Within this Landscape
The profession of pharmacy has actively positioned itself so that it is included in changes occurring within the HIT landscape. However, despite increased involvement from national pharmacy associations through the Pharmacy Health Information Technology Collaborative (Collaborative), certain challenges remain. One of the most significant challenges to pharmacists’ access to patient information is their lack of designation as providers under CMS.

Access here refers to electronic access through interoperable systems; if pharmacists are not designated as providers, they are not eligible for meaningful use incentives. Currently, only doctors of medicine or osteopathy, doctors of dental surgery or dental medicine, doctors of podiatry, doctors of optometry, and chiropractors are eligible for Medicare-based meaningful use incentives.13 Pharmacists are allowed access to patient information by complying with regulations under the Health Insurance Portability and Accountability Act (HIPAA), but in most cases this request for access occurs via fax or telephone versus an integrated EHR. Pharmacists are commonly excluded from the conversation involving access to patient health information, and the concern is that many HIT systems, on a local and national level, are being created without pharmacist input.

Pharmacists are challenged on a daily basis to verify patient and provider information, medication information, and the validity of a prescription. Usually these questions are resolved by communicating with the physician or a physician office staff member. These multiple areas of inquiry require constant communication interrupting both the physician’s and pharmacist’s practice environments. Unfortunately for pharmacy, these interruptions led the American Medical Association (AMA) to pass a policy on inappropriate inquiries. Policy D-35.981, titled “AMA Response to Pharmacy Intrusion into Medical Practice,” states that “Our AMA deems inappropriate inquiries from pharmacies to verify the medical rationale behind prescriptions, diagnoses, and treatment plans to be an interference with the practice of medicine and unwarranted.”14 The policy was created in reference to the verification of legitimate controlled substance prescriptions, but it makes the point that these types of interruptions can detract from overall patient care. This policy and frustration by physicians could have been avoided had there been adequate access to patient information and interoperable communication between physicians and pharmacists.

As mentioned earlier, the Collaborative has been actively involved in promoting pharmacy involvement in the planning of HIT services on the national level. The Collaborative has created multiple work groups to identify key areas within the realm of HIT where pharmacists should be included. These areas are highlighted within a document produced by the Collaborative titled “The Roadmap for Pharmacy Health Information Technology Integration in U.S. Health Care.”15 The Collaborative is currently updating these goals, which coincide with the purpose of this background document. Along with general guiding principles, they serve as the Collaborative’s strategic plan.
Collaborative Goals

- Ensure HIT supports pharmacists in health care service delivery
- Achieve integration of clinical data with electronic prescribing (e-prescribing) information
- Advocate pharmacist recognition in existing programs and policies
- Ensure HIT infrastructure includes and supports MTM services
- Integrate pharmacist-delivered immunizations into the EHR
- Achieve recognition of pharmacist as meaningful users of EHR quality measures
- Advance system vendor EHR certification
- Promote pharmacist adoption and use of HIT and EHRs
- Achieve integration of pharmacies and pharmacists into health information exchanges
- Establish the value and effective use of HIT solutions by pharmacists

Collaborative Guiding Principles

- Identify (through the consensus work of expert panelists) the minimum data set and functional EHR requirements for the delivery, documentation, and billing of pharmacist-provided medication management services. Such requirements include access to key medical information, such as laboratory data, and bidirectional communication flow among all practitioners
- Structure and support implementation of a Pharmacy Practitioner HIT roadmap (Roadmap). The Roadmap is a document that directs and establishes benchmarks. These benchmarks will describe the development, implementation, and application of technology in an efficient and effective manner for pharmacists to affect improved medication use
- Build cooperative relationships within pharmacy and among pharmacy and other stakeholders to communicate and advocate for the Pharmacy Practitioner minimum data set and Roadmap leading to a certified EHR as defined in the Federal Register
- Ensure pharmacy representation on key HIT-related committees and workgroups

This Roadmap also discusses the role that pharmacists can play with increased access to patient information. MTM services are performed in almost every pharmacy setting with documentation manually and/or electronically. Goal four of the Roadmap focuses further on areas to consider within MTM services. One of these areas is the enhancement of transitions of care between different levels of health care. A well-documented medication record through reconciliation within the patient’s EHR will benefit all health care providers who interact with that patient regardless of where the providers are within the health care system. Medication adherence is another area where MTM services can have a significant impact. A study completed by the National Community Pharmacists Association showed that about 75% of adults 40 and older with a chronic condition concede at least one nonadherent behavior in the past 12 months, and more than half report multiple forms of noncompliance. The most common response for nonadherence was simply forgetting. Allowing a pharmacist access to patient information to conduct MTM services could have a significant impact in the national issue of medication nonadherence.

A summary article from the American Society of Health-System Pharmacists (ASHP) Ambulatory Care Conference and Summit drives home the issues pharmacists across the spectrum of practice face. Dr. Kelly Epplen, one of the speakers at the conference, stated, “Pharmacists need to have access to all information … across the care continuum, if we are to support safe, efficient, and effective medication use”. She went on to say that “at this moment, pharmacists practicing in ambulatory care settings absolutely do not have the type of information technology infrastructure they need to provide optimal services.” The article mentions the presence of spotty electronic medical record connectivity and the unlikelihood that manually faxed pharmacist documentation will be entered into a patient’s EHR. However, potential exists for enhancing pharmacist access with clinical document architecture. These programs must be housed within the systems in use at the pharmacy or they must be added. This option
depends on the presence of the physical technology in the pharmacy, with additional support from physician practices to then allow pharmacist access.

**Access to and Interpretation of Patient Information**
Gaining access to patient information is easier said than done. Gaining access is also merely the first step to proper use of patient information. The interpretation of data to benefit patient outcomes or safety is the next step to full meaningful use. Focusing on access issues reveals not only an initial physical barrier due to a lack of interoperability between technologies, but also a privacy barrier due to a lack of patient permission or the need to comply with statutory requirements. In addition, misinterpretation of privacy laws by those in control of patient information further complicates the access issue.

The lack of interface among different pieces of HIT, along with the inconsistency of HIT use, sums up the need for increased interoperability between all methods of communication involving health care providers. Current overall access to patient medical records is limited, and, as revealed by the ASHP ambulatory care conference pharmacists’ limited access to patient information is a barrier to proper care.

The privacy barriers stem from federal statutes along with individual patient preference and a varying interpretation of HIPAA laws within health care organizations. Data segmentation is quickly becoming more prevalent as more providers gain access to patient information. Specifically, future research should examine the role of genomic data in affecting medication therapies. Patients have the ability to restrict access to certain data such as lab results or genomic test results and can also restrict the users who can see that data. Patient engagement will be a key factor to best manage user preference for data sharing between health care providers as data segmentation moves forward. Building a strong relationship between patients, providers, and pharmacists will ensure trust to share data openly. As decisions are made in this area, the importance of educating the patient regarding pharmacist access to health information will increase.

Proper and effective use of patient information is important once access is obtained. A pharmacist has the clinical knowledge to interpret patient information and make clinically based recommendations. These recommendations can be effective only if they are communicated not only to the patient but also to the primary care provider and other health care team members. Bidirectional communication is essential for the proper use of patient data. This communication should take a reasonable amount of time and be unencumbered by complicated systems.

**Electronic Prescribing**
A reduction in medication errors, improved quality of care, and reduced time gap between point of care and point of service were the main drivers to incorporate e-prescribing systems within pharmacies. Legibility of prescription information and problems with physician signatures were issues commonly encountered with hand-written prescriptions. Early e-prescribing systems reduced errors caused by these problems. However, e-prescribing may have created the opportunity for different types of errors.

Standards exist for e-prescribing operations within the realm of electronic communication from system to system. These standards, referred to as the NCPDP SCRIPT Standard, were created and are continually managed by the National Council for Prescription Drug Programs (NCPDP). The SCRIPT Standard includes specifications for pharmacies, prescribers, and other entities (e.g., payers, processors, health plans, intermediaries). NCPDP is constantly working to advance these standards beyond current capabilities to expand opportunities for pharmacy through e-prescribing software.

No universal standards exist related to qualifications of users or training requirements before using e-prescribing software. Multiple e-prescribing systems with varying functionality exist in the marketplace. Two general types of systems are those that are integrated into EHRs and those that are stand-alone.
Within these two general types, systems may have medication decision support of varying degrees or be without these support functions.\textsuperscript{10}

With several different types of e-prescribing software available in the marketplace, the potential for error is multiplied. Best practices for use of e-prescribing software are contained in a toolkit from the Agency for Healthcare Research and Quality (AHRQ) that is meant to help reduce error potential.\textsuperscript{23} The toolkit suggests continual education beyond the initial training session to instill the importance of proper e-prescribing techniques.\textsuperscript{23} The extent to which this toolkit is used is unknown, and if users do not stay up to date with their current e-prescribing system, then errors may become more prevalent. AHRQ also identified some articles that set forth best practices for use and implementation, but they were published between 2004 and 2006 and may not be up to date with current e-prescribing capabilities.\textsuperscript{24} An article published in 2008 from a chain pharmacy practice outlines the general recommendations for pharmacy usage; however, this article might also be outdated.\textsuperscript{25} Surescripts has published its own version of e-prescribing best practices, but what is needed is one set standard for all e-prescribing companies within the marketplace.\textsuperscript{26}

As previously mentioned, e-prescribing systems solved some issues but then opened the door to new problems. With inadequate or improper training, users may enter incorrect information into the wrong field or add conflicting instructions in the Additional Comments section.\textsuperscript{27,28} One study found an error rate of 1 in 10 prescriptions, which matched the previously found error rate for handwritten prescriptions.\textsuperscript{28} Errors in the selection of pull-down menu items have also been an area of concern. In addition, there is limited access to error reporting systems related to e-prescribing. The PEER Portal was created to collect data related to errors found specifically in a pharmacy setting. This web-based platform showed that the majority of errors were related to SIG/directions (25%) and quantity selection (18%), followed by electronic prescriptions containing conflicting information (11%) and dose selection (10%).\textsuperscript{29} The median time spent resolving errors was 10 minutes, which was found to cost about $9 per corrected e-prescription error.\textsuperscript{29} To resolve technology errors, system vendors must be aware of what is not working. If technology vendors do not make system modifications voluntarily, standards must be revised and enforced to mandate the problem resolution.\textsuperscript{29}

**New Technologies**

At present, an almost unlimited amount of information can be accessed by the swipe of a fingertip. Health care data is no different, and new technologies should always be considered to positively affect patient care. Many web-based health information platforms are in operation today. Some hospitals allow patients to view lab results, schedule appointments, and even send inquiries to their providers. The Health and Human Services Blue Button Initiative gives patients secure access to personal health records.\textsuperscript{30} Access to this data can also be provided to various designated recipients. Data can be accessed online or through a phone or tablet-based application.\textsuperscript{30} The use of new technology enabling patients to become more involved in their personal health care must be considered by all health professionals.

The importance of health and pharmacy informatics will continue to grow as new technologies are created and require detailed knowledge for proper integration. Integrated systems will need to merge different types of data formats, which highlights another barrier. A recent collaboration between Walgreens and Greenway Health overcame this barrier by allowing such access, which resulted in the largest centralized pharmacy cloud-based EHR system in existence today.\textsuperscript{31} Future integration between EHRs, e-prescribing, prescription drug monitoring programs, immunization registries, and others will be essential to enhancing patient care among all health professionals. Much of the needed data exchange can occur seamlessly without additional effort from health providers. Meaningfully and appropriately utilizing the information will be the challenge for providers.
Conclusion

The world of HIT is evolving rapidly and will continue to do so into the future. The profession of pharmacy must play an active role in obtaining equal and effective access to patient information through the work of the Pharmacy HIT Collaborative. Access to relevant patient data in an EHR should be straightforward and allow for timely exchange of information between the pharmacist and physician. The pharmacist’s ability to provide advanced patient care services and enhance patient safety will be expanded through adequate access to patient information. Use of e-prescribing and EHR systems should require enhanced training or qualifications to prevent the occurrence of medication errors. Standardization of interface abilities and ease of use between e-prescribing and EHR systems should be considered as more and more health professionals gain access to these capabilities. Through these various actions, the profession of pharmacy will have a better chance to break out of silos and expand the impact to patients provided through pharmacist patient care services.

References


2. American Academy of Family Physicians (AAFP), Center for Health IT, 2013


Relevant APhA Policies

1998 Access and Contribution to Health Records
1. APhA urges the integration of pharmacy-based patient data into patient health records to facilitate the delivery of integrated care.
2. APhA recognizes pharmacists' need for patient health care data and information and supports their access and contribution to patient health records.
3. APhA supports public policies that protect the patient’s privacy yet preserve access to personal health data for research when the patient has consented to such research or when the patient’s identity is protected.
4. APhA encourages interdisciplinary discussion regarding accountability and oversight for appropriate use of health information.


2004 Automation and Technology in Pharmacy Practice
1. APhA supports the use of automation and technology in pharmacy practice, with pharmacists maintaining oversight of these systems.
2. APhA recommends that pharmacists and other pharmacy personnel implement policies and procedures addressing the use of technology and automation to ensure safety, accuracy, security, data integrity and patient confidentiality.
3. APhA supports initial and on-going system-specific education and training of all affected personnel when automation and technology are utilized in the workplace.
4. APhA shall work with all relevant parties to facilitate the appropriate use of automation and technology in pharmacy practice.

(Reviewed 2006) (Reviewed 2008) (Reviewed 2013)

2010 E-prescribing Standardization
1. APhA supports the standardization of user interfaces to improve quality and reduce errors unique to e-prescribing.
2. APhA supports reporting mechanisms and research efforts to evaluate the effectiveness, safety, and quality of e-prescribing systems, computerized prescriber order entry (CPOE) systems, and the e-prescriptions that they produce, in order to improve health information technology systems and, ultimately, patient care.
3. APhA supports the development of financial incentives for pharmacists and prescribers to provide high quality e-prescribing activities.
4. APhA supports the inclusion of pharmacists in quality improvement and meaningful use activities related to the use of e-prescribing and other health information technology that would positively impact patient health outcomes.

(Reviewed 2010)

2010 Personal Health Records
1. APhA supports patient utilization of personal health records, defined as records of health-related information managed, shared, and controlled by the individual, to facilitate self-management and communication across the continuum of care.
2. APhA urges both public and private entities to identify and include pharmacists and other stakeholders in the development of personal health record systems and the adoption of standards, including but not limited to terminology, security, documentation, and coding of data contained within personal health records.

3. APhA supports the development, implementation, and maintenance of personal health record systems that are accessible and searchable by pharmacists and other health care providers, interoperable and portable across health information systems, customizable to the needs of the patient, and able to differentiate information provided by a health care provider and the patient.

4. APhA supports pharmacist taking the leadership role in educating the public about the importance of maintaining current and accurate medication-related information within personal health records.

(JAPhA NS40(4):471 July/August 2010) (Reviewed 2013)

2009 Health Information Technology

1. APhA supports the delivery of informatics education within pharmacy schools and continuing education programs to improve patient care, to understand interoperability among systems, to understand where to find information, to increase productivity, and to improve the ability to measure and report the value of pharmacists in the health care system.

2. APhA urges that pharmacists have read/write access to electronic health record data for the purposes of improving patient care and medication use outcomes.

3. APhA encourages inclusion of pharmacists in the defining, development and implementation of health information technologies for the purpose of improving the quality of patient-centric health care.

4. APhA urges public and private entities to include pharmacist representatives in the creation of standards, the certification of systems, and the integration of medication use systems with health information technology.

(JAPhA NS49(4):492 July/August 2009) (Reviewed 2010) (Reviewed 2013)

2001 Automation and Technical Assistance

APhA supports the use of automation for prescription preparation and supports technical and personnel assistance for performing administrative duties and facilitating pharmacist’s provision of pharmaceutical care.


2003 Prior Authorization

1. APhA opposes prior authorization programs that create barriers to patient care.

2. Patients, prescribers, and pharmacists should have ready access to the coverage conditions for medications or devices requiring prior authorization.

3. Prescription drug benefit plan sponsors and administrators should actively seek and integrate the input of network pharmacists in the design and operation of prior authorization programs.

4. APhA supports prior authorization programs that allow pharmacists to provide the necessary information to determine appropriate patient care.

5. APhA expects prescription drug benefit plan sponsors to compensate pharmacy providers who complete third-party payer authorization procedures. Compensation should be in addition to dispensing fee arrangements.

6. APhA should work with relevant groups to improve prior authorization design and decrease prescription processing inefficiencies.