

# Automation and Information Technology

## Ensuring Patient Safety and Data Integrity During Cyber-attacks (1701)

*Source: Council on Pharmacy Management*

To advocate that healthcare organizations include pharmacists in (1) assessing cyber-security systems and procedures for vulnerabilities, (2) implementing cyber-security strategies, and (3) reviewing cyber-security breaches and developing corrective actions; further,

To encourage the development of business continuity plans by pharmacy departments; further,

To advocate that healthcare organizations assess vendor systems to validate the security and integrity of data, including an assessment of the minimum amount of patient health information vendors require to provide services.

## Mobile Health Tools, Clinical Apps, and Associated Devices (1708)

*Source: Council on Pharmacy Management*

To advocate that patients, pharmacists, and other healthcare professionals be involved in the selection, approval, and management of mobile health tools, clinical software applications (“clinical apps”), and associated devices used by clinicians and patients for patient care; further,

To foster development of tools and resources to assist pharmacists in designing and assessing processes to ensure safe, accurate, supported, and secure use of mobile health tools, clinical apps, and associated devices; further,

To advocate that decisions regarding the selection, approval, and management of mobile health tools, clinical apps, and associated devices should further the goal of delivering safe and effective patient care and optimizing outcomes; further,

To advocate that mobile health tools, clinical apps, and associated devices that contain health information be interoperable and, if applicable, be structured to allow incorporation of health information into the patient’s electronic health record and other essential clinical systems to facilitate optimal health outcomes; further,

To advocate that pharmacists be included in regulatory and other evaluation and approval of mobile health tools, clinical apps, and associated devices that involve medications or medication management.

## Therapeutic Indication in Clinical Decision Support Systems (1608)

*Source: Council on Therapeutics*

To advocate that healthcare organizations optimize use of clinical decision support systems by including the appropriate indication for medications.

## Online Pharmacy and Internet Prescribing (1529)

*Source: Council on Pharmacy Practice*

To support efforts to regulate prescribing and dispensing of medications via the Internet; further,

To support legislation or regulation that requires online pharmacies to list the states in which the pharmacy and pharmacists are licensed, and, if prescribing services are offered, requires that the sites (1) ensure that a legitimate patient-prescriber relationship exists (consistent with profes-

sional practice standards) and (2) list the states in which the prescribers are licensed; further,

To support mandatory accreditation of online pharmacies by the National Association of Boards of Pharmacy Verified Internet Pharmacy Practice Sites or Veterinary-Verified Internet Pharmacy Practice Sites; further,

To support appropriate consumer education about the risks and benefits of using online pharmacies; further,

To support the principle that any medication distribution or drug therapy management system must provide timely access to, and interaction with, appropriate professional pharmacist patient-care services.

*This policy supersedes ASHP policy 0523.*

## Risk Assessment of Health Information Technology (1418)

*Source: Council on Pharmacy Management*

To urge hospitals and health systems to directly involve departments of pharmacy in performing appropriate risk assessment before new health information technology (HIT) is implemented or existing HIT is upgraded, and as part of the continuous evaluation of current HIT performance; further,

To advocate that HIT vendors provide estimates of the resources required to implement and support new HIT; further,

To collaborate with HIT vendors to encourage the development of HIT that improves patient-care outcomes; further,

To advocate for changes in federal law that would recognize HIT vendors’ safety accountability.

*This policy was reviewed in 2019 by the Council on Pharmacy Management and by the Board of Directors and was found to still be appropriate.*

## Interoperability of Patient-Care Technologies (1302)

*Source: Council on Pharmacy Management*

To encourage interdisciplinary development and implementation of technical and semantic standards for health information technology (HIT) that would promote the interoperability of patient-care technologies that utilize medication-related databases (e.g., medication order processing systems, automated dispensing cabinets, intelligent infusion pumps, electronic health records); further,

To encourage the integration, consolidation, and harmonization of medication-related databases used in patient-care technologies to reduce the risk that outdated, inaccurate, or conflicting data might be used and to minimize the resources required to maintain such databases.

*This policy was reviewed in 2017 by the Council on Pharmacy Management and by the Board of Directors and was found to still be appropriate.*

## Pharmacist’s Role in Health Care Information Systems (1211)

*Source: Council on Pharmacy Management*

To strongly advocate key decision-making roles for pharmacists in the planning, selection, design, implementation, and maintenance of medication-use information systems, electronic health records, computerized provider order en-

## ASHP Policy Positions 2009–2019 (with Rationales): Automation and Information Technology

**1701**

### **Ensuring Patient Safety and Data Integrity During Cyber-attacks**

*Source: Council on Pharmacy Management*

To advocate that healthcare organizations include pharmacists in (1) assessing cyber-security systems and procedures for vulnerabilities, (2) implementing cyber-security strategies, and (3) reviewing cyber-security breaches and developing corrective actions; further,

To encourage the development of business continuity plans by pharmacy departments; further,

To advocate that healthcare organizations assess vendor systems to validate the security and integrity of data, including an assessment of the minimum amount of patient health information vendors require to provide services.

#### ***Rationale***

As use of technology in healthcare has increased, so has the risk of [cyber-attacks](#) on this essential infrastructure. The digitization of patient records and the movement to enhance healthcare with technology has increased the risk of cyber-attacks; from 2015 to 2016, there was a 5.2% increase in such attacks against healthcare targets. Moreover, healthcare facilities made up 7.1% of the identified targets in July 2016, a 5.3% increase from the previous month. Maintaining the privacy of health information, in compliance with the Health Insurance Portability and Affordability Act (HIPAA), and ensuring patient safety in the face of cyber-attacks have become essential concerns for every healthcare organization. In July 2016, the U.S. Department of Health and Human Services released [guidance on ransomware and HIPAA](#). Despite this guidance, there remains very little assistance to prevent data breaches or advice on how to respond when an attack occurs. Increased connectivity with vendor systems creates a mutual need to share access to patient information and other vital data, so risk mitigation must be considered at all points of access. Pharmacists and pharmacy departments need to contribute to organizational efforts to prevent and respond to cyber-attacks as well as develop business continuity plans to ensure they can meet patient needs and protect patient privacy in case of such attacks.

**1708**

### **Mobile Health Tools, Clinical Apps, and Associated Devices**

*Source: Council on Pharmacy Management*

To advocate that patients, pharmacists, and other healthcare professionals be involved in the selection, approval, and management of mobile health tools, clinical software applications ("clinical apps"), and associated devices used by clinicians and patients for patient care; further,

To foster development of tools and resources to assist pharmacists in designing and assessing processes to ensure safe, accurate, supported, and secure use of mobile health tools, clinical apps, and associated devices; further,

To advocate that decisions regarding the selection, approval, and management of mobile health tools, clinical apps, and associated devices should further the goal of delivering safe and effective patient care and optimizing outcomes; further,

To advocate that mobile health tools, clinical apps, and associated devices that contain health information be interoperable and, if applicable, be structured to allow incorporation of health information into the patient's electronic health record and other essential clinical systems to facilitate optimal health outcomes; further,

To advocate that pharmacists be included in regulatory and other evaluation and approval of mobile health tools, clinical apps, and associated devices that involve medications or medication management.

### ***Rationale***

The use of mobile devices (e.g., smartphones, tablets) has become commonplace. Over 68% of adults own a smartphone, and 62% of those use their smartphones to access health information. In addition to these mobile devices, use of remote monitoring devices is also being rapidly integrated into healthcare. According to a 2015 survey, although only 16% of healthcare professionals currently use mobile health tools in caring for patients, 46% plan to do so in the next five years. With the proliferation of mobile health tools, clinical apps, and associated devices, healthcare organizations need to address the potential risks of application use. Particular concerns include (1) assessing the quality of mobile health tools, clinical apps, and associated devices; (2) standardizing choices and use across the organization; and (3) ensuring the security of data and data storage.

To maximize the effectiveness of mobile health tools, clinical apps, and associated devices, they must be selected, approved, and managed with the goal of improving care and with input from representatives of all affected parties, including patients, physicians, pharmacists, and other healthcare professionals. In addition, their effectiveness is enhanced when they are interoperable (as described in ASHP policy 1302, [Interoperability of Patient-Care Technologies](#)) and the data stored within them can be incorporated into the patient's electronic health record and other essential clinical systems.

Providers and patients currently have little guidance regarding use of these resources or the management of the data they provide. The Food and Drug Administration and other regulatory agencies are just beginning to determine the scope of their oversight. As medication-use experts, pharmacists can contribute to the regulatory evaluation and approval of mobile health tools, clinical apps, and associated devices that involve medications or medication management. In addition, ASHP is committed to fostering development of resources to help pharmacists ensure safe, accurate, supported, and secure use of mobile health tools, clinical apps, and associated devices.

**1608****Therapeutic Indication in Clinical Decision Support Systems**

Source: Council on Therapeutics

To advocate that healthcare organizations optimize use of clinical decision support systems by including the appropriate indication for medications.

**Rationale**

Several well-known studies have demonstrated reductions in wrong-patient errors and adverse events with the inclusion of indication on the prescription order. In 2010, Equale<sup>1</sup> described the accuracy of indication information in electronic health records (EHRs). Galanter<sup>2</sup> focused on preventing wrong-patient medication errors with the use of indication-based prescribing. Indication-based alerts resulted in an interception rate of 0.25 interceptions per 1000 alerts. One investigator conducted a trial of inpatient indication-based prescribing using computerized provider order entry (CPOE) with medications commonly used off-label.<sup>3</sup> In a 60-day trial documenting indications in the CPOE system for lansoprazole, intravenous immune globulin, and recombinant Factor VII, the accurate diagnosis rates after validation by a clinician were 9, 16, and 24 percent, respectively. In a study in the *Joint Commission Journal on Quality and Patient Safety*, investigators tracked a total of 140,755 medications filled by pharmacy technicians over a seven-month period in an academic institution. A total of 5,075 (3.6%) contained errors, and 1,059 contained an error that was not detected by the hospital pharmacist. Just over 23 percent of the undetected errors were potential adverse drug events.<sup>4</sup> Addressing these errors can have a large public health impact. Off-label prescription medication use without strong scientific evidence has also been associated with increased rates of adverse drug events, according to an article in *JAMA Internal Medicine*.<sup>5</sup> The authors suggested that use of the electronic health record (EHR) and proper documentation of therapeutic indication can help improve surveillance and safety and decrease risk.

In several countries, including Canada and Spain, the EHR includes indication as part of comprehensive documentation. ASHP first developed official policy on the importance of pharmacists' access to indications in 1993. In 1996, the National Coordinating Council for Medication Error Reporting and Prevention recommended including the purpose of prescription orders because of concerns about safety, unless considered inappropriate by the

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<sup>1</sup> Equale T, Winslade N, Hanley JA et al. Enhancing pharmacosurveillance with systematic collection of treatment indication in electronic prescribing. *Drug Saf* 2010; 33: 559-67.

<sup>2</sup> Galanter W, Falck S, Burns M, et al. Indication-based prescribing prevents wrong-patient medication errors in computerized provider order entry (CPOE). *J Am Med Inform Assoc*. 2013;20:477–81.

<sup>3</sup> Walton SM, Galanter WL, Rosencranz H, et al. A trial of inpatient indication based prescribing during computerized order entry with medications used off-label. *Appl Clin Inf*. 2011;2:94–103.

<sup>4</sup> Cina JL, Gandhi TK, Churchill W, et al. How many hospital pharmacy medication dispensing errors go undetected? *Joint Commission Journal on Quality and Patient Safety* 2006; 32:73-80.

<sup>5</sup> Equale T, Buckeridge DL, Verma A, et al. Association of off-label drug use and adverse drug events in an adult population. *JAMA Internal Medicine* 2016; 176:55-63. doi:10.1001/jamainternmed.2015.6058.

prescribers. In 1999, the Institute for Safe Medication Practices recommended including the purpose of prescribing on all written orders. In 2004, the National Association of Boards of Pharmacy (NABP) approved a resolution encouraging national and state medical associations to support legislative and regulatory efforts to require prescribers to include indications for all oral, written, and electronically transmitted prescriptions. In 2012, the United States Pharmacopeia made amendments to the standards for prescription container labeling to include “purpose-for-use” language. In 2015, the National Council of Prescription Drug Plans drafted language to recommend diagnosis and SNOMED indication be sent with any prescription.

A project funded by the National Institutes of Health (NIH) project in collaboration with the Agency for Healthcare Research and Quality is underway to assess, evaluate, and make recommendations on optimal communication of the purpose of prescribing. The goal of the project is to improve prescribing safety by redesigning CPOE to incorporate the medication indication into the prescription order. ASHP is a primary partner in this initiative, and almost 100 organizations have already joined the effort. Three phased goals are expected from this project. Phase one consists of a series of webinars. Phase two consists of the development of a white paper that outlines and specifies best practices and ideas obtained from the workgroups and webinars. Finally, phase three consists of the creation of simulated models of ideal systems that can reduce harm and increase efficiency. This project will focus on six domains: medication error prevention and mitigation, facilitating patient education, promoting prescribing drugs of choice, enhanced team communication, organizing the medication list for medication reconciliation, and enabling comparative outcomes research.

## **1617**

### **Automated Preparation and Dispensing Technology for Sterile Preparations**

*Source: Council on Pharmacy Practice*

To advocate that health systems adopt automation and information technology for preparing and dispensing compounded sterile preparations when such adoption is (1) planned, implemented, and managed with pharmacists’ involvement; (2) implemented with adequate resources to promote successful development and maintenance; and (3) supported by policies and procedures that ensure the safety, effectiveness, and efficiency of the medication-use process; further,

To educate patient safety advocacy groups and regulatory agencies on the capabilities and benefits of automation and technology for preparing and dispensing compounded sterile preparations, and to encourage them to establish expectation of adoption by health systems; further,

To foster further research, development, and publication of best practices regarding automation and information technology for preparing and dispensing sterile preparations.

### ***Rationale***

Adoption of automation and information technology for preparing and dispensing sterile

preparations is increasing but not evenly distributed among healthcare organizations. A 2014 ASHP survey showed that 40-60% of larger health systems used automated IV compounding technology in compounding nutrition support preparations. Less than 20% of all health systems surveyed employed barcode verification in their IV medication preparation process. A 2013 survey found that less than 10% of all health systems surveyed used drug workflow software to manage IV drug preparation, verification, and dispensing.

The reasons for these disparate rates of adoption are numerous. Each institution has a different break-even point of investment versus return, and challenges of implementation can be daunting. Some organizations have implemented automated compounding technology only to withdraw it later. The probability of successful adoption of automation and information technology for preparing and dispensing sterile preparations is increased when it is planned, implemented, and managed with pharmacists' involvement and when adequate resources (including time) are planned for and provided not only to develop but also to maintain the technologies. Upfront costs and ongoing investments need to be clear from the start. Use of such technology also requires well-crafted policies and procedures to ensure the safety, effectiveness, and efficiency of the medication-use process. Research, development, and publication of best practices regarding automation and information technology for preparing and dispensing sterile preparations will require efforts not only from vendors but also from those who have experience with the process. Adoption of such technology will also be accelerated if patient safety advocacy groups and regulatory agencies understand and appreciate the technology's value and establish an expectation of adoption among healthcare organizations.

## 1529

### **ONLINE PHARMACY AND INTERNET PRESCRIBING**

*Source: Council on Pharmacy Practice*

To support efforts to regulate prescribing and dispensing of medications via the Internet; further,

To support legislation or regulation that requires online pharmacies to list the states in which the pharmacy and pharmacists are licensed, and, if prescribing services are offered, requires that the sites (1) ensure that a legitimate patient-prescriber relationship exists (consistent with professional practice standards) and (2) list the states in which the prescribers are licensed; further,

To support mandatory accreditation of online pharmacies by the National Association of Boards of Pharmacy Verified Internet Pharmacy Practice Sites or Veterinary-Verified Internet Pharmacy Practice Sites; further,

To support appropriate consumer education about the risks and benefits of using online pharmacies; further,

To support the principle that any medication distribution or drug therapy management system must provide timely access to, and interaction with, appropriate professional pharmacist patient-care services.

*This policy supersedes ASHP policy 0523.*

### **Rationale**

ASHP's vision to make medication use safe, optimal, and effective includes supporting efforts to protect the public from unscrupulous website operators who illegally provide medications online. Patients are entitled to know whether the healthcare providers prescribing and dispensing their medications are licensed, and in which states they are licensed. ASHP supports legislation and regulations that would require online pharmacies to provide such information. To further guarantee patient safety, ASHP advocates mandatory accreditation of such sites by the National Association of Boards of Pharmacy (NABP) Verified Internet Pharmacy Practice Sites (VIPPS) and Veterinary-Verified Internet Pharmacy Practice Sites (Vet-VIPPS) accreditation programs for online pharmacies to assure the public that the pharmacies are compliant with federal and state regulations and NABP criteria. Education of consumers will be required to ensure that online pharmacies are used wisely, and use of online pharmacies should involve appropriate pharmacist counseling.

### **1418**

#### **RISK ASSESSMENT OF HEALTH INFORMATION TECHNOLOGY**

*Source: Council on Pharmacy Management*

To urge hospitals and health systems to directly involve departments of pharmacy in performing appropriate risk assessment before new health information technology (HIT) is implemented or existing HIT is upgraded, and as part of the continuous evaluation of current HIT performance; further,

To advocate that HIT vendors provide estimates of the resources required to implement and support new HIT; further,

To collaborate with HIT vendors to encourage the development of HIT that improves patient-care outcomes; further,

To advocate for changes in federal law that would recognize HIT vendors' safety accountability.

### **Rationale**

The adoption of HIT in hospitals has been increasing at a quickening pace. The ASHP National Survey – 2012 reports the adoption of the following: full paperless electronic health record (EHR) (18.6%), computerized provider order entry with clinical decision support (CPOE with CDS) (54.4%), bar-coded medication administration (BCMA) (65.5%), and smart pumps (77%). The adoption of HIT has undoubtedly been spurred by the American Recovery and

Reinvestment Act (ARRA) and the Health Information Technology for Economic and Clinical Health Act (HITECH) provisions under Meaningful Use (MU) of the EHR. Hospitals have been incentivized to implement EHRs that meet the MU criteria by increased reimbursement through Medicare and/or Medicaid payments. Due to the strict guidelines and the rush to meet incentive payments, many providers are questioning whether some HIT is being implemented too quickly.

The implementation of HIT within the medication-use process has been proven to prevent and decrease errors, improve quality, and prevent waste. A key premise of the Office of the National Coordinator for Health Information Technology (ONC) report “Health Information Technology Patient Safety Action & Surveillance Plan” (July 2013) is that HIT, when fully integrated into health care delivery organizations, facilitates substantial improvements in health care quality and safety as compared to paper records. As hospitals and providers implement HIT within their institutions and practices, however, they often encounter new types of errors and problems. The medical literature is starting to see reports of these unintended consequences of HIT, so continuous monitoring of these systems is required. It has become increasingly important to properly assess the interface between HIT and users to identify whether any new risk has been introduced to the system and implement HIT appropriately, taking into account medication-use processes and human factors. Critical questions hospitals and health systems face include (1) when do HIT advances exceed the capacity for integration into workflow, (2) when does HIT begin to introduce risk into the medication-use process rather than improve patient safety, and (3) what are the accountabilities of HIT providers, regulators, and providers to ensure the necessary product development and assessments are made before implementation of new HIT.

ASHP advocates that the pharmacy department be part of the implementation team for any medication-related technology within an institution. Technology assessment tools should be applied by pharmacists and others to proactively determine gaps in function prior to implementation, during upgrades, and as part of the continuous evaluation of HIT performance. The use of failure modes effects analysis (FMEA) and other resources should be considered. Risk assessment should also be considered when implementing any new technology to ensure that unintended consequences are minimized.

Regulatory and accreditation organizations include components of risk assessment and quality improvement within their criteria, but hospitals need to incorporate these into their overall plans. Such risk assessments could result in less attention on some HIT implementations. Finally, federal law need to recognize vendors’ accountability for the safety of their products as implemented.

## **1302**

### **INTEROPERABILITY OF PATIENT-CARE TECHNOLOGIES**

*Source: Council on Pharmacy Management*

To encourage interdisciplinary development and implementation of technical and semantic standards for health information technology (HIT) that would promote the interoperability of patient-care technologies that utilize medication-related databases (e.g.,



medication order processing systems, automated dispensing cabinets, intelligent infusion pumps, electronic health records); further,

To encourage the integration, consolidation, and harmonization of medication-related databases used in patient-care technologies to reduce the risk that outdated, inaccurate, or conflicting data might be used and to minimize the resources required to maintain such databases.

### ***Rationale***

There are significant pharmacy management issues associated with the multiplicity of medication databases in hospitals and health systems. Among the issues are lack of standardization in the medication databases used in pharmacy order-processing systems, automated dispensing cabinets, intelligent infusion pumps, electronic health records, and other patient-care-related technologies dependent on accurate and harmonized medication databases. In addition, there is variability in the primary sources of medication information in these databases and in how the databases are updated. The longstanding issue of lack of interoperability of medication-related information technology compounds the problem. The risk-management implications of this situation are not fully understood, but the urgent need to address this complex issue increases as the dependence on information technologies and the accuracy of associated information proliferates to more aspects of patient care.

Although it is important to recognize the differences among technologies used in patient care, there is a need to have both a standardized format to describe medications as well as means for efficiently managing the medication databases in order to safely populate and update the different technologies that rely on drug information. Coalitions such as the Pharmacy e-Health Information Technology Collaborative are increasingly important in providing expertise, organizing and participating in stakeholder events, and advocating for best practices. It may, however, be necessary for other organizations to convene stakeholders to develop standards for the harmonization of medication-related databases.

## **1211**

### **PHARMACIST'S ROLE IN HEALTH CARE INFORMATION SYSTEMS**

*Source: Council on Pharmacy Management*

To strongly advocate key decision-making roles for pharmacists in the planning, selection, design, implementation, and maintenance of medication-use information systems, electronic health records, computerized provider order entry systems, and e-prescribing systems to facilitate clinical decision support, data analysis, and education of users for the purpose of ensuring the safe and effective use of medications; further,

To advocate for incentives to hospitals and health systems for the adoption of patient-care technologies; further,

To recognize that design and maintenance of medication-use information systems is an interdisciplinary process that requires ongoing collaboration among many disciplines; further,

To advocate that pharmacists must have accountability for strategic planning and direct operational aspects of the medication-use process, including the successful deployment of medication-use information systems.

*This policy supersedes ASHP policy 0921.*

### **Rationale**

The Council discussed the evolving nature of health IT and the technology requirements for the pharmacy enterprise. The Council believed that current ASHP policy did not clearly describe the successful design and use of technology that supports the medication-use process as an interdisciplinary effort and voted to amend ASHP policy 0921 to reflect the interdisciplinary nature of the medication-use process that requires collaboration in design, implementation, and maintenance. The Council also believed that it was important that pharmacists have accountability for the medication-use process, including the successful deployment of medication-use information systems.

## **1212**

### **CLINICAL DECISION SUPPORT SYSTEMS**

*Source: Council on Pharmacy Management*

To advocate for the development of clinical decision support (CDS) systems that are proven to improve medication-use outcomes and that include the following capabilities: (1) alerts, notifications, and summary data views provided to the appropriate people at the appropriate times in clinical workflows, based on (a) a rich set of patient-specific data, (b) standardized, evidence-based medication-use best practices, and (c) identifiable patterns in medication-use data in the electronic health record; (2) audit trails of all CDS alerts, notifications, and follow-up activity; (3) structured clinical documentation functionality linked to individual CDS alerts and notifications; and (4) highly accessible and detailed management reporting capabilities that facilitate assessment of the quality and completeness of CDS responses and the effects of CDS on patient outcomes.

### **Rationale**

The Council discussed the technology requirements of the pharmacy enterprise and ASHP policies related to technology. The Council believed that one area where a gap in ASHP policy existed was in the area of clinical decision support. Current clinical decision support systems do not provide the functionality that is required in the future practice model that is envisioned by participants at the [Pharmacy Practice Model Initiative](#) (PPMI) Summit. The Council believed that ASHP should advocate for improvements in clinical decision support systems that provide actionable data analytics and support the medication-use process.

## **1006**

### **DEFINITION OF MEANINGFUL USE OF HEALTH INFORMATION TECHNOLOGY**

*Source: Council on Public Policy*

To advocate to policymakers (public and private) that definitions of "meaningful use of health information technology" address interoperability of medication orders and prescriptions, medication decision support and continuous improvement, and quality reporting; further,

To advocate with respect to interoperability of medication orders and prescriptions that (1) a common medication vocabulary be mandated to promote the semantic interoperability of medication use across the continuum of care, because a common vocabulary is essential for comparative effectiveness research and for communicating medication information; and (2) communication of orders and electronic prescriptions must be demonstrated to be functional and semantically interoperable with pharmacy information systems; further,

To advocate with respect to medication decision support and continuous improvement that (1) medication decision support should include but not be limited to allergy, drug interaction (e.g., drug-lab or drug-disease interactions), duplicate therapy, and dose-range checking; and (2) that such a decision-support service must include an ongoing, continuous improvement process to attune the decision-support service to the needs of the providers who use it; further,

To advocate with respect to quality reporting that the ability to quantify improved patient safety, quality outcomes, and cost reductions in the medication-use process is essential, particularly in antimicrobial and adverse event surveillance.

### ***Rationale***

ASHP recognizes the growing influence of health information technology (HIT) on health-system pharmacy practice. Provisions in American Recovery and Reinvestment Act (ARRA) direct federal policymakers to develop definitions of and standards regarding the term "meaningful use" and the implementation of HIT by hospitals and health systems in order to receive incentive payments from Medicare and Medicaid.

Since the medication-use process is pervasive in health systems and throughout the continuum of care, the definition of "meaningful use" needs to address the concept of interoperability, the criticality of decision support systems, and the use of quality reporting to improve patient safety.

## **1020**

### **ROLE OF PHARMACISTS IN SAFE TECHNOLOGY IMPLEMENTATION**

*Source: Council on Pharmacy Practice*

To affirm the essential role of the pharmacist in the evaluation, implementation, and ongoing assessment of all technology intended to ensure safety, effectiveness, and efficiency of the medication-use process.

### ***Rationale***

Effective use of automation and technology solutions improves efficiency, allows more time for direct patient care, and ensures safe medication management. The Joint Commission Sentinel Event Alert published in December 2008 outlined patient safety concerns specific to technology

implementation and recommended specific actions to reduce error and patient harm. The Institute for Safe Medication Practices (ISMP) has published related recommendations for specific technologies and noted recently that one drug delivery device was marketed to promote physician autonomy as a benefit of its use.

try systems, and e-prescribing systems to facilitate clinical decision support, data analysis, and education of users for the purpose of ensuring the safe and effective use of medications; further,

To advocate for incentives to hospitals and health systems for the adoption of patient-care technologies; further,

To recognize that design and maintenance of medication-use information systems is an interdisciplinary process that requires ongoing collaboration among many disciplines; further,

To advocate that pharmacists must have accountability for strategic planning and direct operational aspects of the medication-use process, including the successful deployment of medication-use information systems.

*This policy was reviewed in 2016 by the Council on Pharmacy Management and by the Board of Directors and was found to still be appropriate.*

### **Clinical Decision Support Systems (1212)**

*Source: Council on Pharmacy Management*

To advocate for the development of clinical decision support (CDS) systems that are proven to improve medication-use outcomes and that include the following capabilities: (1) alerts, notifications, and summary data views provided to the appropriate people at the appropriate times in clinical workflows, based on (a) a rich set of patient-specific data, (b) standardized, evidence-based medication-use best practices, and (c) identifiable patterns in medication-use data in the electronic health record; (2) audit trails of all CDS alerts, notifications, and follow-up activity; (3) structured clinical documentation functionality linked to individual CDS alerts and notifications; and (4) highly accessible and detailed management reporting capabilities that facilitate assessment of the quality and completeness of CDS responses and the effects of CDS on patient outcomes.

*This policy was reviewed in 2017 by the Council on Pharmacy Management and by the Board of Directors and was found to still be appropriate.*

### **Definition of Meaningful Use of Health Information Technology (1006)**

*Source: Council on Public Policy*

To advocate to policymakers (public and private) that definitions of “meaningful use of health information technology” address interoperability of medication orders and prescriptions, medication decision support and continuous improvement, and quality reporting; further,

To advocate with respect to interoperability of medication orders and prescriptions that (1) a common medication vocabulary be mandated to promote the semantic interoperability of medication use across the continuum of care, because a common vocabulary is essential for comparative effectiveness research and for communicating medication information; and (2) communication of orders and electronic prescriptions must be demonstrated to be functional and semantically interoperable with pharmacy information systems; further,

To advocate with respect to medication decision support and continuous improvement that (1) medication decision support should include but not be limited to allergy,

drug interaction (e.g., drug-lab or drug-disease interactions), duplicate therapy, and dose-range checking; and (2) that such a decision-support service must include an ongoing, continuous improvement process to attune the decision-support service to the needs of the providers who use it; further,

To advocate with respect to quality reporting that the ability to quantify improved patient safety, quality outcomes, and cost reductions in the medication-use process is essential, particularly in antimicrobial and adverse event surveillance.

*This policy was reviewed in 2014 by the Council on Public Policy and by the Board of Directors and was found to still be appropriate.*

### **Role of Pharmacists in Safe Technology Implementation (1020)**

*Source: Council on Pharmacy Practice*

To affirm the essential role of the pharmacist in the evaluation, implementation, and ongoing assessment of all technology intended to ensure safety, effectiveness, and efficiency of the medication-use process.

*This policy was reviewed in 2014 by the Council on Pharmacy Practice and by the Board of Directors and was found to still be appropriate.*

### **Electronic Health and Business Technology and Services (0712)**

*Source: Council on Pharmacy Practice*

To encourage pharmacists to assume a leadership role in their hospitals and health systems with respect to strategic planning for and implementation of electronic health and business technology and services; further,

To encourage hospital and health-system administrators to provide dedicated resources for pharmacy departments to design, implement, and maintain electronic health and business technology and services; further,

To advocate the inclusion of electronic health technology and telepharmacy issues and applications in college of pharmacy curricula.

*This policy was reviewed in 2016 by the Council on Pharmacy Practice and by the Board of Directors and was found to still be appropriate.*

### **Electronic Information Systems (0507)**

*Source: Council on Administrative Affairs*

To advocate the use of electronic information systems, with appropriate security controls, that enable the integration of patient-specific data that is accessible in all components of a health system; further,

To support the use of technology that allows the transfer of patient information needed for appropriate medication management across the continuum of care; further,

To urge computer software vendors and pharmaceutical suppliers to provide standards for definition, collection, coding, and exchange of clinical data used in the medication-use process; further,

To pursue formal and informal liaisons with appropriate health care associations to ensure that the interests of patient care and safety in the medication-use process are

fully represented in the standardization, integration, and implementation of electronic information systems; further,

To strongly encourage health-system administrators, regulatory bodies, and other appropriate groups to provide health-system pharmacists with full access to patient-specific clinical data.

*This policy was reviewed in 2014 by the Council on Pharmacy Practice and by the Board of Directors and was found to still be appropriate.*

#### **Computerized Prescriber Order Entry (0105)**

*Source: Council on Administrative Affairs*

To advocate the use of computerized entry of medication orders or prescriptions by the prescriber when (1) it is planned, implemented, and managed with pharmacists' involvement, (2) such orders are part of a single, shared database that is fully integrated with the pharmacy information system and other key information system components, especially the patient's medication administration record, (3) such com-

puterized order entry improves the safety, efficiency, and accuracy of the medication-use process, and (4) it includes provisions for the pharmacist to review and verify the order's appropriateness before medication administration, except in those instances when review would cause a medically unacceptable delay.

*This policy was reviewed in 2015 by the Council on Pharmacy Management and by the Board of Directors and was found to still be appropriate.*

#### **Regulation of Automated Drug Distribution Systems (9813)**

*Source: Council on Legal and Public Affairs*

To work with the Drug Enforcement Administration and other agencies to seek regulatory and policy changes to accommodate automated drug distribution in health systems.

*This policy was reviewed in 2017 by the Council on Public Policy and by the Board of Directors and was found to still be appropriate.*

# ASHP Statement on Bar-Code-Enabled Medication Administration Technology

## Position

The American Society of Health-System Pharmacists (ASHP) encourages health systems to adopt bar-code-enabled medication administration (BCMA) technology to improve patient safety and the accuracy of medication administration and documentation. To support the goal of having all medications electronically verified before they are administered, BCMA systems should be used in all areas of health systems in which medications are used. Pharmacists must be involved in the interdisciplinary planning, development, implementation, and management of BCMA systems and must ultimately be responsible for developing and maintaining the infrastructure required to ensure BCMA success. Health systems deploying BCMA programs must provide the funding and staffing necessary to permit pharmacists to fulfill this role.

ASHP urges the Food and Drug Administration (FDA) and other regulatory agencies, standard-setting bodies, contracting entities, health systems, and others to mandate that pharmaceutical manufacturers use symbologies that are readily deciphered by commonly used scanning equipment to code for the National Drug Code (NDC), lot number, and expiration date on all unit dose, unit-of-use, and injectable drug packaging. Pharmaceutical manufacturers should also provide all medications used in health systems in unit dose packages. FDA, pharmaceutical manufacturers and packagers, and the manufacturers of BCMA systems should collaborate to minimize or eliminate the causes of false rejection of valid medication doses. Certain characteristics of the current NDC identification system contribute to the burden of implementing BCMA systems, and ASHP urges stakeholders to participate in efforts to develop a system that more reliably identifies the unique drug (or combination of drugs), strength, dosage form, and route of administration.

Although bar-coding systems are currently a widely used point-of-care technology, ASHP recognizes that other types of machine-readable coding (e.g., radio-frequency identification) may evolve. ASHP supports the use of new technologies that are as effective as or improve upon existing systems and believes the principles outlined in this statement apply to such systems. ASHP urges further research on such systems as well as research that will definitively determine the extent to which BCMA systems reduce preventable medication errors and provide a financial return on investment for health systems.

## Background

Since the 1980s, health care practitioners and policymakers have recognized the potential benefits of using bar-coding technology in the medication dispensing and administration process.<sup>1-5</sup> Although there is a consensus of professional judgment and expert opinion on the advancement of BCMA technology, more studies are needed to definitively determine the impact of BCMA systems on medication errors and the finances of health systems. ASHP believes that optimally

implemented BCMA systems have tremendous potential to improve patient safety. In addition, the reengineering of the medication-use process required to implement a BCMA system can provide opportunities for performance improvement in patient care and clinical documentation.

A 2005 ASHP survey estimated that only 13.2% of hospitals used a BCMA system.<sup>6</sup> Although this percentage is small, it represents an almost 10-fold increase since 2002.<sup>7</sup> The rapid adoption of BCMA systems presents challenges to health systems, and ASHP believes that pharmacists have a crucial role in responding to those challenges.

## Role of the Pharmacist

Pharmacists should take the lead in ensuring that the implementation of BCMA systems and the reengineering of the medication-use system address the complexities of the process and that the goal of improving patient safety is achieved. Poor design and inadequate planning can compromise the effectiveness of a BCMA system and may even introduce new sources of error into the medication-use process.<sup>8</sup> Growing experience with BCMA systems has produced a body of knowledge that will aid hospitals and health systems in the adoption of BCMA systems.<sup>9-12</sup>

Pharmacy leadership needs to engage the chief information officer, chief nursing officer, and other key stakeholders in planning for BCMA systems as early as possible. Pharmacists and nurses should be involved with the preinstallation evaluation and selection of the BCMA system. Allowing end users to provide crucial advice about system design will increase acceptance and utility of the system.

Implementation of a BCMA system must be accompanied by the development of policies and procedures that ensure the system's safety. These policies and procedures should be developed by an interdisciplinary team that includes pharmacists.<sup>10</sup> Pharmacists and nurses should be involved with postinstallation evaluation and system improvement.

The role of nurses as end users of this technology should not be underestimated; nursing involvement is essential to successful system implementation and use. Processes for delivery and storage of medications (e.g., in medicine rooms or bedside storage spaces) should be examined by pharmacists and nurses to avoid workarounds or diversion.

## Elements of a BCMA System

Although every hospital and health system will need to develop a BCMA system that meets its own needs, the following general principles should guide the implementation and use of such systems.

Use of the BCMA system should be universal within the health system. To the fullest extent feasible, every patient, care provider, and medication should receive a unique identifier, and that identifier should be used not only to verify care prescribed for a patient but also to document every significant step in the medication-use process.