INFORMATION TECHNOLOGIES IN PHARMACY

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ABSTRACT

Information technologies play an important role in the life of our society. They are also important in the field of pharmacy. The provision of high-quality medical care to the population, effective management of a pharmacy enterprise is closely related to the proper organization of information and communication activities in the pharmaceutical market.

Keywords: Information technologies, management of a pharmacy, communication activities, pharmaceutical market.

Health information technologies are increasingly being used to support how health care providers collect, document, and share patient care information. Health care reform and technological advancements are transforming the standards of patient care and it is important that pharmacist-provided clinical data is integrated into these new systems.

In modern conditions of development of the pharmaceutical market and new information technologies, the factor of successful development of pharmacy enterprises is the active use of information and communication technologies both for interaction with customers and suppliers, and in internal processes. Pharmaceutical trade and manufacturing enterprises “Pharmacy”, pharmaceutical factories and plants currently in a market economy need prompt collection of information, its processing, and the use of the results of its analysis in the course of its activities. The development of a full-fledged management system in pharmaceutical enterprises is a key step towards bringing production to the level of international standards. The organizational structure of pharmaceutical enterprises, in most cases, is a system of many branches remote from each other with a centralized accounting and control body. In such conditions, the implementation of operational document management and its control are the most important tasks. The current level of production development dictates new requirements for production management. Automation of production reduces the risk of creating defects in production as a result of mistakes made by personnel. This is especially important in the conditions of pharmaceutical production, in which the slightest violation of the technology of manufactured products can lead to loss of health of consumers of medicines – sick people .A big problem in the modern conditions of the

Russian economy is the rapid transfer of funds to the branches of the organization, settlements with suppliers and customers.

Interoperability and bidirectionality

Do community pharmacies currently have systems that can make meaningful secure exchange of health information as seamless as possible, and that allow for communications with all healthcare practitioners in a given region? Not as yet, said Shelly Spiro, RPh, FASCP, executive director of the Pharmacy Health Information Technology Collaborative in Alexandria, VA. The focus of the Pharmacy HIT Collaborative is to assure meaningful use of standardized EHRs to support safe and effective medication use and care, and to provide access to the services of pharmacists with other members of a patient's care team.

Few pharmacies have systems that are interoperable, meaning they can work with other systems, or bidirectional, meaning that the secure exchange of information goes to and from the pharmacy, she said.

The collaborative, formed in 2010 by nine pharmacy professional associations, works to help guide how the pharmacist fits into the national health information infrastructure. "The collaborative focuses more on the clinical aspects of what pharmacists do," she said. Systems that automate dispensing help pharmacists deal with counseling a patient on one prescription. Those that allow for exchange of health information bring in more information that allows pharmacists to improve their clinical services-especially medication therapy management (MTM).

Pharmacy systems need to be interoperable; they need to be able to share the pharmacy's clinical information about a patient with other healthcare providers, such as physicians and hospitals, said Spiro. Information needs to move as seamlessly as possible, without the need for manual entry of data from one system into another. A system has to have the functionality to allow the pharmacist to access and easily use information about a patient for actions in addition to dispensing medications, and to be able to share pharmacy information as well, she said.Pharmacists do not currently have the incentives in place that are pushing hospitals and physicians' offices toward a greater exchange of clinical information, Spiro said.

What's out there?

Several companies offer pharmacy management systems-the software that helps both the business and clinical workings of a pharmacy. These systems can be used to maintain the records for new and refilled prescriptions, drug databases, verification of prescriptions, patient medication records, and prescriber records, said Will Lockwood, director of editorial content at Computer Talk for the Pharmacist. They can be used to review and submit claims for reimbursement to third-party payers, review paid and rejected claims, manage inventory and ordering, and manage delivery. They can track the workflow of the dispensing process-including which employee completed which

steps and when; manage clinical tasks, such as MTM interactions; track adherence data; track and reconcile receivables; and record that prescriptions have been picked up and paid for, said Lockwood. “The more up-to-date a system is, the more likely it is to include many of these functions,” he added.

Creating useful exchanges of information will require pharmacists to have systems that allow them to expand the record of their interactions with patients beyond the traditional medication profile and prescription history, Lockwood said. They will need to include more details of the patient’s clinical history. These details may come from the pharmacy’s interaction with a patient during MTM sessions, for example, or from information such as lab data that the pharmacy can pull from other health IT systems.

“There are a number of different vendors out there,” said Lockwood. “There are several with a substantial national footprint of installations and others with smaller and/or regional installation bases.”

Several technology companies have created products or systems for use in pharmacies, such as PDX, QS/1, PioneerRx, Rx30, Computer Rx, McKesson, and Surescripts.

What system-or portions of a system-that a community pharmacy chooses to buy will vary greatly depending on its own needs, Lockwood said. There may not be a one-size-fits-all system.

Many large chains and some smaller ones have created their own systems. A “home-grown” system, as Spiro called them, is more customized for a given location. There are some pharmacists who work closely with a physician’s office or an accountable care organization and who have come up with solutions that work for them and allow them access, she said. They may have written software that can interface between different systems from different vendors, which gives them access to a patient’s medical records and the ability to communicate seamlessly.

However, many of these systems are not seamless, Spiro said. A pharmacist may say he or she has access because they can log into a hospital or a regional system and look at medical records, but then they still have to print out the information they need and enter it into the pharmacy’s own system by hand.

Low(ish) tech can still be a help

Sometimes, even a comparatively low-tech I/HIE system gives a pharmacy a big advantage. Beauchamp & O’Rourke Pharmacy in Rutland, VT, has been using McKesson’s pharmacy management system for 12 years, said Marty Irons, BSPharm, managing pharmacist. But it is using a simple internet browser to access information at Rutland Regional Medical Center.

“We are using Google Chrome with no additional software,” he said. Each day he gets a fax from the hospital that lists the pharmacy’s patients who are in the hospital or

who have been discharged within the last 24 hours. Irons then goes online to the hospital's website to access data on those patients. This information includes their diagnosis, lab results, the physicians' notes, drug allergies, and discharge plans, among other information.

Having this I access has been extremely useful, Irons said. Beauchamp & O'Rourke has transitioned from dispensing medications in vials to creating comingled blister packs that give their patients a week's worth of their medications in 28 compartments marked by the day and time they should be taken. Medication reconciliation was often a problem. "Having access to a patient's HER has dramatically cut down on unreconciled medications," Irons added.

The biggest benefit of this system has come from the ability to see a patient's lab results. Irons often advises that a patient's medications be stopped because the lab work shows it is not needed.

But Rutland is a small community and Rutland Regional Medical Center is used by 95% or more of local people, which is why this uncomplicated I/HIE system works, Irons said. "I can't imagine doing this with more than two hospitals."

High(er) tech access

In contrast to a browser-based access system, Amina Abubakar, PharmD, AAHIVP, owner of Rx Clinic Pharmacy in Charlotte, NC, has a lot of direct access to a system that gives her bidirectional communications and interoperability.

Her pharmacy uses Pioneer Rx's pharmacy management system "for everything," Abubakar said, including internal communications, and also for access to I/HIE. She uses the software to log on to the Community Care of North Carolina's Pharmace Home website that allows her to share information about Medicaid and Medicare patients. Pharmace Home connects pharmacies, physicians, and care managers. "I document my findings in the pharmacy home and they go to the doctor. They can see my notes. They can see drug therapy problems," she said. There is a single sign-on to get into the system and it then operates with her software.

Information goes both ways. The pharmacy's software connects to Pharmace Home and Abubakar does not have to log out of one to get into the other. "I don't have to leave Pioneer to get into the pharmacy home and look at history of the patient and look at what the care managers have done."

The system also allows her to send texts to patients and keeps track of it as an MTM action until they respond.

"I like the fact that we can connect these different pieces in order to help our patients," Abubakar said, adding that this communication allows for proper care coordination which saves the healthcare system money. "We are working with the patients that cost the health system the most."

There are still steps where information must be put in by hand, however. Patient care managers fax discharge summaries to the pharmacy and they must be uploaded into the pharmacy's system, Abubakar said.

Replacing a system

With every type of technology or software, continuing innovation and plain old wear and tear on hardware may lead to a need to replace or update a pharmacy's system. This can mean anything from minor updates and tweaks to complete top-to-bottom replacement.

"Switching systems can be a chore simply because these software platforms are so business critical, and processes and protocols are developed around their functionality," Lockwood said. But pharmacies will switch systems if they decide that they need new or different or better features. "There are companies that specialize in moving databases over for this kind of switch." Regional and national pharmacy chains say that they revisit their software systems and upgrade them regularly, and may install a new product every three years or so. Smaller pharmacies may be less likely to switch, and may use the same software packages for years, he added.

For the most part, upgrading a pharmacy's management system takes the form of software updates, which most vendors issue. Abubakar noted that she gets frequent updates of software from Pioneer Rx that are incorporated without difficulty or any need to shut down for a time.

Marty Irons would like to see more interoperability between the hospital's system and his pharmacy. But even having his pharmacy's relatively simple access to the patient's I has been revelatory for him and has shown how much more a pharmacist can do with greater access to information.

A Safer Pharmacy

"Protecting yourself starts with pharmacy leaders and staff educating themselves about the risks and the impact cyberattacks can have on your organization and your patients," said Melissa Skelton Duke, PharmD, MS, BCPS, FAPhA, executive director of population health pharmacy solutions at Banner Health in Phoenix, Arizona. "The second thing is to minimize the risk of cybersecurity attacks in day-to-day operations. It's a cat-and-mouse game that is always evolving."

Solid cybersecurity takes a layered approach. The first layer is a private domain—something like fredspharmacy.com, Dorazio said. A private domain enables company email, which is easier to secure than multiple employee email addresses. "We still see pharmacists using AOL for their email, which is anything but secure," said Dalton Fabian, PharmD, data scientist at UnityPoint Health in Des Moines, Iowa. "Not using a company email for your pharmacy, or allowing employees to log in using their personal email, is inviting attack."

Just as physical security starts with an alarmed wall, cybersecurity starts with a firewall that can be tuned to stop threats from the outside, block outgoing connections to unsafe locations, and prevent downloads of content, such as online games that may harbor malware. A virtual private network encrypts traffic, which is a key safeguard when staffers log into the pharmacy system remotely.

"Work with your IT [information technology] vendor to design your protection, first by finding an IT security vendor who knows health care—preferably pharmacy," Fabian said. "We have specific cybersecurity needs and vulnerabilities."

The next layer of security is antivirus. Dorazio recommended active EDR/XDR (end point detection and response/extended detection and response) antivirus. With cyber crooks using artificial intelligence (AI) to create malware, pharmacies need AI protection. "EDR/XDR is AI-based to detect [emerging] threats," he said. "Having these active protections on each device is one of the best ways to stop intruders."

The final layer is staff training. Phishing—emails designed to trick users into disclosing information, opening infected attachments, or visiting infected websites—is the source of most ransomware and other malware, Dorazio explained. Every person with any access to any part of the pharmacy system—from the owner to the newest part-timer—should be trained to recognize phishing.

"The most effective approach is a short training session with a surprise phishing test from you or a security firm like ours," he said. "That [instantly] tells you who got the message and who needs to pay more attention."

The key is to look at where the email came from and where any active links lead, Dorazio explained. Before visiting any links, right-click to see the true source of an email and the true destination of a link. "Think before you click," he said. "If there is one-half of 1% of doubt, don't click on it. If you're not expecting something, chances are it's not real."

Modern conditions they require that settlements be made practically "day-to-day" in order to avoid losses of funds and delays in deliveries as a result of inflationary processes .The solution to these problems is the development and implementation of information technologies, i.e. technologies based on the use of computer technology and electronic means of communication .Relatively low cost, reliability, ease of maintenance and operation expands the scope of information technology technologies, primarily due to those areas of human activity in which computing technology was not used before due to the high cost, complexity of maintenance and interaction. These areas include institutional activities, where the use of information technology has allowed to increase the productivity of specialists involved in information processing.

This aspect is especially relevant due to the extremely low growth rates of managerial labor productivity. In modern days, the scale and pace of the introduction of control automation tools in the national economy with particular urgency pose the task of

conducting comprehensive research related to the comprehensive study, generalization and systematization of problems arising in this case, both practical and theoretical, and finding solutions to them, In modern conditions, information support has become an important area, which consists in collecting and processing information necessary for making informed management decisions in the company's economy.

The transfer of information about the position and activities of the enterprise to the highest level of management and the mutual exchange of information between all divisions of the company are carried out on the basis of modern electronic computing and other technical means of communication [8].In the activities of commercial structures, the transfer of information is a primary and indispensable factor of normal the functioning of this structure. At the same time, ensuring the efficiency and reliability of information is of particular importance. For many firms, the in-house information system solves the tasks of organizing the technological process and is of a production nature. This concern, first of all, the processes of providing enterprises with cooperative products coming from specialized enterprises through intra-company channels. Here, information plays an important role in providing information for managerial decision-making and ensures cost reduction production and increasing its efficiency. Of great importance is information about the occurrence of deviations from planned indicators during production that require operational decisions.

The introduction of information technologies into the activities of pharmaceutical enterprises allows to reduce the time required for the preparation of marketing and production projects, reduce unproductive costs several times during their implementation, eliminate the possibility of errors in the preparation of accounting, technological and other types of documentation, modernize the pharmaceutical production process. This brings a commercial company direct economic the effect and considerable benefit in its activities. Innovations also make it possible to develop methods of responding to changes in the market situation. In order to reveal all the potential possibilities that the use of computer tools carries, it is necessary to use a set of software and hardware that best corresponds to the tasks assigned to them. Therefore, at present, there is a great need for commercial companies in computer programs that support the work of management the link of the company, as well as information on how to optimally use the computer equipment available to the company.

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