Pharmacy Automation and Technology

Getting Back to the “Roots” of Drug Information and Looking at the Future Potential

Bill G. Felkey, MS,* and Brent I. Fox, PharmD, PhD†

Drug information service was one of the first specialty areas of pharmacy practice. The importance of effectively searching, interpreting, and applying the medical literature continues today. The information systems that we use in today's health care environment have created new opportunities for pharmacists to apply their drug information expertise. We address some of these opportunities this month, along with a brief tie-in to work performed over a decade ago.

As the adoption and implementation of electronic health records (EHRs) increase, we have begun to appreciate how interconnected all of the component parts of the information flow are within the medication use process. Professional support people who are impacted include EHR system vendors, drug index database vendors, tertiary reference companies, and a variety of other types of publishers. We were contacted when a drug manufacturer learned that its new product, which received US Food and Drug Administration (FDA) approval in 2013, could not be ordered in the EHRs of prescribers because it was not present in the drug index. This occurrence led us to investigate clinical decision support systems (CDSSs), secondary databases that include drug ordering indexes, FDA medication guides, consumer medication information, popular tertiary references, manufacture labeling processes, and package inserts. We even made an effort to work through all of the meaningful use phases and requirements again, like the info button.

Drug labelers work through the approval process with the FDA and then attempt to inform the drug information industry about their new products and any updates that occur. These data are utilized by every EHR vendor for everything from computerized prescriber order entry, drug interaction alerts and flags, conflict resolution monographs, and health systems-specific decision support and guidelines. The best CDSS present the information needed to reduce uncertainty in clinical decision making with a minimum of false positives,

and they drill down into the specific information being sought by the clinician. To avoid “alert fatigue,” potential drug-related problems can be categorized, in one decision-support product, into 7 severity levels. Individual health systems can decide that they only want to see warnings that fall into the 3 highest categories of severity, but they can selectively target other warnings from lower levels of severity when desired.

Given the rigor of the FDA approval process, package inserts from the manufacturer/labeler play a key role in the entire drug information process. Portions of the package insert such as black box warnings, contraindications and other precautions, and alerts make their way into the creation of decision-support flags and many other drug information applications. Some of the drug information providers work closely with panels of experts that oversee the interpretation of the package insert information and then produce monographs and other clinical pearls that can be derived from the primary literature. We found that several of the drug information vendors are creating fairly static, text-based information and the best of these organize their monographs so that precise information being sought by the clinician can be quickly accessed. Increasingly, many pharmacists employ multiple drug information databases for the purpose of cross-validation in their decision making.

Integration of systems is still the biggest challenge for all health care technology. Having to break out of one system to open the screen of another or pulling out a smartphone to access a drug database

*Professor Emeritus, Auburn University, Auburn, Alabama; †Associate Professor, Department of Health Outcomes Research and Policy, Harrison School of Pharmacy, Auburn University, Auburn, Alabama

or mobile app is not something that promotes efficiency in the care process. Later phases of meaningful use requirements are focusing on the need for clinicians to be able to resolve drug information issues within their native EHR systems. This requirement is being met through the production of embedded info buttons that anticipate the need for additional information while providers are delivering and documenting the care of an individual patient. While some info buttons are being used to display only static textual information, they can also connect end users to Web apps that provide interactive materials including calculators and multimedia resources such as proper preparation procedures in video formats.

So where are the patients and their families and ambulatory caregivers in this whole process? Meaningful use requirements now include the need for the delivery of patient-specific educational materials. We were working on this problem over 15 years ago for the United States Pharmacopeia. We produced a prototype called Visually Interactive Drug Education Offerings (VIDEOs). It took the patient information leaflet and made it age, race, gender, drug, and indication specific for each individual patient. Males did not have to see pregnancy and breast-feeding information associated with their drugs and females did not have to hear how a drug would impact their prostate. In

our early demonstrations of the prototype, we asked men if they needed breast-feeding precautions and they typically responded “no.” We asked one of the females in our audience if she owned the prostate and she replied, “No, but I share one.”

All of this information was delivered through a touchscreen interactive kiosk, and the videos that supported the narrative on the screen were tuned to show specific examples that were selected from a database so that each patient received a customized presentation designed for them individually based on the criteria listed above. Our early project was a proof of concept that is very relevant to what is possible today and is much more feasible. Fully 82% of Americans learn best by visual means. The delivery of specific, multimedia messages can occur in the health system at discharge but can also follow patients home so that learning can be continuous for them, their families, and the other caregivers in their lives.

Do you share our vision for future EHRs to promote seamless support across an enterprise that extends from the intensive care unit to the patient’s home? We firmly believe that the limit of our imagination is our only restraint. Feel free to comment or ask us any questions about this process and topic. We would like to hear from you. You can contact Bill at felkebg@auburn.edu or Brent at foxbren@auburn.edu. ■