Original Article

Primer on the Implementation of a Pharmacy Intranet Site to Improve Department Communication

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Abstract

Purpose: The purpose of the article is to describe the experience of selecting, developing, and implementing a pharmacy department intranet site with commentary regarding application to other institutions. Clinical practitioners and supporting staff need an effective, efficient, organized, and user-friendly communication tool to utilize and relay information required to optimize patient care.

Summary: To create a functional and user-friendly department intranet site, department leadership and staff should be involved in the process from selection of product through implementation. A product that supports both document storage management and communication delivery and has the capability to be customized to provide varied levels of site access is desirable. The designation of an intranet site owner/developer within the department will facilitate purposeful site design and site maintenance execution. A well-designed and up-to-date site along with formal end-user training are essential for staff adoption and continued utilization.

Conclusion: Development of a department intranet site requires a considerable time investment by several members of the department. The implementation of an intranet site can be an important step toward achieving improved communications. Staff utilization of this resource is key to its success.

Key Words—communication, information management, intranet

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Good communication and information distribution are vital to the success of any department, but they are particularly challenging in a dynamic, multicenter health system that supports around-the-clock patient care. This challenge is increased by the need for frequent communication due to the rapidly changing nature of health care and the resulting organizational growth. There are numerous areas that require communication, including operational, clinical, informatics, drug utilization, department initiatives/projects, students/residents, scheduling, staff development and education, and organizational changes. Clinical practitioners (pharmacists and residents) and supporting staff need an effective, efficient, organized, and user-friendly tool to utilize information required to optimize patient care.

Although the intranet is widely used and is a valuable instrument in a variety of business operations, including health care, few studies have documented the use of a pharmacy department intranet

site, developed and maintained by pharmacists, to improve department communication and information sharing.¹⁻³ Lack of literature in this area may be due to the fact that pharmacist education and competence is rooted in clinical practice not web development. Fortunately, products are available to meet the pharmacy department's communication needs without requiring specialized information technology (IT) training.⁴ The objective of this article is to describe the experience of selecting, developing, and implementing a pharmacy-owned department intranet site with commentary regarding application to other institutions.

BACKGROUND

Setting

The University of Kansas Hospital (KUH) is a 600-bed progressive regional academic medical center providing a full range of inpatient and outpatient services. The Department of Pharmacy at KUH employs approximately 80 clinical pharmacist full-time

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equivalents (FTEs) and 65 support staff (technicians, IT analysts, administrative assistants) FTEs across various sites. The inpatient clinical pharmacist team includes 63 decentralized, team-based pharmacists who provide clinical services to 20 physician rounding teams and treatment areas. Outpatient pharmacy services include retail, cancer care, infusion center, transplant clinics, pre-anesthesia testing clinic, and investigation drug services. The organization continues to undergo growth and change.

Communication Modes Prior to Intranet Site Implementation

The major modes of communication and information delivery in the pharmacy department prior to intranet site implementation included e-mail, staff meetings, and a hospital network drive for document storage. E-mail was the primary means of communication, offering a quick and efficient method to distribute information to pharmacy personnel, but it had several limitations. A high volume of daily e-mails sent by a variety of pharmacy department members (eg, leadership team, clinical staff, technical staff) plus a lack of a standardized departmental e-mail format made it difficult to archive and retrieve a particular communication. Staff frequently missed important information or had trouble identifying the most recent e-mail update. Weekly staff meetings were also used to communicate global and specific changes. However, only a small percentage of department personnel were able to attend due to conflicts with their work schedule or urgent patient care needs. Minutes from the meeting were stored on a hospital network drive, which was also used to store important documents for staff reference. The network drive, a folder-based document storage system without administrative control of site structure and organization, became a document “dumping ground.” All staff members had the authority to add, delete, and modify documents and folders. Likewise, because of the lack of document dating and storage of multiple updated document versions in different folders, outdated material was often retrieved. All of these factors, combined with the absence of a search feature, made it challenging to locate the needed information in a timely manner. Overall, this system was disorganized and not readily accessible; communication affecting daily practice was not streamlined or easily retrievable.

Analysis and Resolution

It was evident that the method of communication before intranet implementation was not suitable for

promoting optimal clinical services. A multifunctional system was needed to allow centralized data storage that was easily searchable and retrievable and to provide a communication tool to distribute information that had traditionally been broadcast via e-mail. A blog both distributes information and archives it for easy retrieval, so it became our choice to replace e-mail.

Site Development

Several communication products were evaluated by the pharmacy and marketing/communications departments. Final installation was performed by the IT department. Selection of a product is likely to be highly dependent on organizational budget and host server capabilities. Microsoft Office SharePoint Server (MOSS) 2007, a multifunctional product, met our 2 primary needs – document storage and a blog – both with a reliable search feature.⁴ SharePoint was already being utilized by KUH in a limited capacity. In addition, SharePoint has a multitude of added features, many of which have been utilized in the pharmacy department: discussion and collaboration (Wikis, discussion boards, document workspaces, meeting workspaces), surveys, Web Pages, announcements, and lists (links, issue tracking, tasks, calendars) and integration with other Microsoft Office applications.⁴ Furthermore, users can customize the alert setting to provide e-mail alerts when information is updated; these alerts can be designated to a document library, list, blog, and so on.⁴ This allows users to be notified of new information without needing to frequently check the site.⁴

Once the base site was installed, several individuals were involved in site development to ensure that the final product met the current and foreseeable future needs of the department. The pharmacy leadership team approved site content and organization and performed a final review of the site before implementation. Likewise, the leadership team and the clinical pharmacists sorted and updated the documents located on the network drive to avoid moving outdated material to the new site.

The SharePoint site project timeline spanned over 12 months, beginning with research into commercial products to solve the communication problem and ending with implementation of the system (**Figure 1**). The 12-month timeline was slowed by the implementation of computerized provider order management (CPOM). The blog feature was implemented first; it slowly incorporated SharePoint into staff workflow and assisted in providing communication during CPOM implementation. The majority of work

on the project was completed in 5 months. One pharmacist, an education coordinator, built the site and provided education regarding its use. Implementation required 1 month of training for the site owner/builder, 2 months to build the site, and 2 months to provide education to all users. During a 3-month period, the primary responsibility of the education coordinator was to learn the product and build the site; this undertaking required 85% of an FTE. The education phase for staff could have been shortened to at least 1 week; however, this training was incorporated into an annual competency program that spanned 2 months.

Site Content and Organization

The overall goal for the department site structure was the organization of information from numerous sources, in various forms, and of diverse genres into one place that was easy to navigate (**Figure 2**). There were 4 crucial and complex areas of design: home page, education/training, precepting students, and IT issue tracking. The remainder of the site design was easily classified.

Pharmacy home page

The configuration of the pharmacy home page was important, because it is the origin point for navigation within the site. The home page includes links to frequently utilized information stored on the site, links to external information (outside department and hospital), and quick launch buttons along the left-hand column. The quick launch column is the main organizational hierarchy of the site, therefore it was important that content was logically grouped into sections, with the most frequently accessed sections toward the top to prevent user scrolling. The “Links to Frequently Used Info” is intended to be dynamic and help users find important, new, and regularly used information. Likewise, temporary links can be added to the home page to draw attention to important but transient information, such as an announcement for an

upgrade to the pharmacy system. In addition, a search feature is available on the home page and at each site and subsite.

Education/training

The education/training subsite was intended to house all forms of clinical, operational, technical, and patient and staff education and training. It was important to store this information in one place without establishing individual folders for different categories. This structure enhances navigation as individuals tend to search for the same topic under a different classification and information may be included in multiple categories. For instance, a user would become frustrated looking for the latest update on how to document vaccination screenings if he or she could not find the information in a “clinical” folder, because the site owner posted the update in an “operational” folder. It was challenging to determine how to combine all of the types and forms of material, especially since an update can be a document or a few lines of text. A custom list was the method decided upon. The front page of the education/training subsite displays the “Training Points/FAQs” list, which was the chosen name for the list. The custom list allows users to post a text update with the option of adding a link to a training document or associated policy or standard of practice. Each post is also assigned a section (or multiple sections) and can be further assigned categories or medication/order set tags. The list can be filtered by section, category, or medication name, so users can narrow posts down to a particular genre, such as “operations.” In addition, posts are sorted by date with the newest at the top. The education/training subsite also contains other sections such as resources, providing education, department initiatives, annual competency, and new hire orientation.

Precepting students

The precepting students subsite was designed to supply clinical pharmacists who serve as preceptors

Figure 1. Timeline of pharmacy SharePoint (SP) site implementation. CPOM = computerized provider order management.

Section	Content/Link to subsite content	Subsite context
Blog (pharmacy)	Organized into categories. Includes all announcements and updates. Often posts have direct links to information stored elsewhere on the SharePoint site.	
Calendars	Extern Calendar Pharmacist Calendar	
Clinical team sites	Cancer Care Critical Care Drug Information Evening Pharmacists Heart Center Internal Medicine IV Room Medication Reconciliation OR Pharmacy Pediatrics/Neonatal	Each team site has a unique structure and material specific to that team
Department policies	Policies & Procedures Standards of Practice	
Documents	Directories Drug Purchasing Drug Shortages Drug Utilization IT Issue Tracking Practice Council Minutes Schedules Staff Meeting Minutes	
Education/Training	Epic Basic Training Manual Competencies Department Initiatives Med (ERX) Changes New Hire Orientation Order Set Changes Providing Education—Resources Training Points/FAQs Epic	Patient Education Outside Education Central Pharmacy Desensitization Protocols Forms and Logs IV Room Pharmaceutical Production
Newsletters	Peer Review ISMP Medication Minute P&T Publications Rewards & Recognition	
Precepting	Grand Rounds Precepting Students Preceptor Development Resident Information	Example Presentations Extern Calendar Extern List Extern Training Manual Evaluation Documents How to... Rotation Schedule Student Policies Teaching Material
Other Sites	Interns Outpatient Pharmacy P&T Committee Technicians	

Figure 2. SharePoint site content. Bold indicates links to subsite.

with essential information regarding pharmacy students who complete experiential rotations on-site (eg, scheduling, policies, and other precepting resources). The subsite contains the yearly rotation schedule of student assignments to corresponding preceptors, a monthly calendar of events for students, and student policies for reference. Additional teaching resources that are posted on the site include example presentations, evaluation documents, shared education topic presentations, and links to external educational resources. Rotational training materials, which are required for the students to complete prior to beginning the rotation, are

posted to the site for preceptor reference. The availability of all of this material in one place facilitates preceptor access to the most updated information.

IT issue tracking

The IT issue tracking list manages all internal department technical issues and requests for optimizations. A staff member fills out a request form and an administrative assistant logs the request into the IT issue tracking list in SharePoint. This system allows the IT team to prioritize, assign, and follow the progress of issues from start to finish. All staff members can view this list and the progress of or response to their request. Likewise, the leadership team receives an e-mail to notify them when issue has been resolved. Prior to this process, the lack of staff knowledge about the progress of the request led to frustration.

Site Implementation

Once the site was completed, full implementation and use followed a staff education period. Education was provided to 3 groups: leadership staff, clinical staff, and supporting staff. The leadership team participated in a single 1-hour training session that included a demonstration with a corresponding handout that reviewed step-by-step instructions for site operations. Clinical staff received a 30-minute training session during a weekly staff meeting. SharePoint training was also incorporated into the clinical staff annual competency program, which included a hands-on “scavenger hunt” exam. Technicians and interns received a live training session at a staff meeting, and administrative assistants were trained individually. The educational period for the department required 2 months due to staffing patterns and availability of personnel to attend training sessions.

Site Access Restrictions

SharePoint offers the ability to customize site access. Sites can be restricted to a group of people; within that group, different access levels can be created to allow varied permissions. The pharmacy department site was restricted to pharmacy personnel. Within the site, 3 levels of access were built: (1) *owners* were given access to design and build (2 pharmacists were given this level of access); (2) *members* could contribute (upload/delete/modify documents, make blog posts, etc) but could not change the structure of the site (the leadership team was granted this level of access); and (3) *visitors* were given read-only access (the remainder of the staff were assigned this access). Within the 3-tier hierarchy of restriction, some individuals were

promoted or demoted in the hierarchy for certain segments of the site according to their departmental responsibilities. For instance, all clinical staff had member access to the individual clinical team sites, so they had freedom to contribute material. Likewise, the IT team had member access to the issue tracking list, so they could update the list as the ticket moved through the process. In contrast, only people who were in control of the schedule had access to modify documents in that library. The ability to customize these restrictions allowed for administrative control of site structure and organization while still allowing staff to contribute information where appropriate.

ADOPTION OF THE NEW PROCESS

Site Usage

SharePoint offers limited standard usage reports, such as the frequency users visit the site and the most frequently accessed pages on the site; this system only reports usage over the past month. For more advanced site owners, Microsoft Office SharePoint Designer offers more options for reporting.⁴ However, SharePoint and SharePoint Designer do not use the same terminology for the reports, therefore it can be difficult to interpret the reported data. According to the SharePoint standard report, after implementation and training was complete, the pharmacy department SharePoint site was accessed an average of 200 times per day.

Staff Feedback

Five months after site implementation and staff training were completed, staff pharmacists were surveyed about their usage and perception regarding the department SharePoint site. A total of 63 completed the survey. Nearly 33% of the pharmacists reported using the site weekly, 32% reported multiple uses per week, and approximately 20% reported using the site daily. Less than 15% of the staff reported using the site monthly or rarely. According to the survey, 70% of respondents stated that SharePoint was an improved method of document storage and communication; in a similar question, only 61% stated that it was easier to find information using SharePoint. The reason for the discrepancy in responses is unclear. In addition, over 70% of respondents replied “always” or “most of the time” to the question, “Are you able to find the needed information on SharePoint?”

DISCUSSION

Site Design/Build

When pursuing implementation of any departmental internet site, it is crucial to designate a primary

builder/owner of the site within the department. Outside owners may not understand interdepartmental infrastructure and operations, which is essential to designing an efficient and effective intranet site. In addition, external owners may have other responsibilities and may not be able to enact necessary changes in a timely manner. The site owner often needs basic computer skills complemented by specific program training. Some type of formal educational support during the design process is favored over self-training, as it is more efficient and may provide a global perspective on the capabilities of the program. Likewise, it is helpful to have external departmental IT support of the product at the institution and to have other departments use the same product to facilitate knowledge sharing among site owners. Since implementation of the pharmacy department site, SharePoint usage has expanded in other departments at KUH and a SharePoint user group was formed. In addition, it is essential that staff members and the leadership team be involved in the design process to ensure that the design is intuitive for most people, while appreciating that no design will suit everyone.

Implementation

Several strategies contribute to a successful implementation. Mandatory competency assessment is instrumental in staff adoption and minimizes the need for education after implementation. Likewise, limiting the publication of essential departmental documents to the SharePoint site helps direct traffic to the site. Staff members may continue to utilize other methods of communication (eg, department-wide e-mails), but re-education at each occurrence may limit this activity. In addition, tiered access and responsibilities within the site may need to be reassessed based on the frequency of these re-education episodes.

Maintenance

Ongoing maintenance requires a significant time commitment from the site owner. On a regular basis, the site owner needs to post new material and monitor the site for retained integrity. The dynamic nature of the site also requires ongoing changes to be made to accommodate modifications, enhancements, and implementation of new functionality. The site will evolve as site usage increases and new applications are envisioned. Furthermore, different levels of access will require constant maintenance of user groups as new employees are hired, staff assume new roles, and residents revolve on an annual basis. Maintenance could involve a time commitment of up to 2 to 5 hours per week or more for

the site owner, depending on the extent of the site; additional time will be required to build new functionality. Additionally, a review process for posted material should be developed to ensure the site remains accurate and current; this process should involve staff members from all areas of expertise, not just the leadership team.

Evaluation

Communication challenges in large, multicenter medical center are universal.¹⁻³ Eberts et al and Campbell et al illustrate comparable success to KUH in implementing a pharmacy department SharePoint site; all these initiatives have site owners and developers within the department.^{1,2} Similar to findings at KUH, the available literature also supports the following actions to promote successful implementation: site owner training to fully demonstrate the functionality of the product prior to site development, vetting site structure and content through front-line staff prior to implementation, and providing end-user education in the form of live demonstration and/or hands-on training.^{1,2} In contrast, Campbell et al described a staff-driven project with leadership support, whereas the leadership at KUH constructed the project around current and future needs of the department and utilized staff members to validate and vet site content.²

Future Directions

Several areas will be explored in the future to enhance communications, including increasing staff contributions to the site and the developing other applications to increase efficiency. SharePoint has several options that may encourage staff involvement in contributing clinical knowledge and facilitating staff collaboration (eg, discussion boards and Wiki sites). If desired, site-owner approval for posts can be required before the posts are viewable to all staff. Likewise, other approval pathways could be implemented to allow staff to directly submit content to the site. In addition, the incorporation of an approval workflow into the KUH departmental policy review process is being explored to increase efficiency and ensure

completeness. In this scenario, the policy owner (department leadership) would receive notification when the policy review is initially required and the director of pharmacy would receive an alert when the review work is completed and ready for final signature. Also, an approval workflow could be implemented for pharmacy students in the drug information center to facilitate preceptor approval of responses to drug information questions. Since implementation, a blog subsite for the KUH Pharmacy Practice Model Initiative has been initiated to keep staff informed of and involved in the process and upcoming changes.

CONCLUSION

Development of a department intranet site requires a considerable time investment by several members of the department. A primary owner within the department should be identified initially to develop and maintain the site. An intranet site offers many applications to improve the complex communication involved in health care. A well-designed intranet site can be an effective, efficient, organized, and user-friendly tool to utilize the information that is required to optimize patient care. Implementation of an intranet site can be an important step toward achieving improved communications, but staff adoption and utilization of this resource will be the keys to success.

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