SPECIAL ARTICLES

Selecting a Clinical Intervention Documentation System for an Academic Setting

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Pharmacists' clinical interventions have been the subject of a substantial body of literature that focuses on the process and outcomes of establishing an intervention documentation program within the acute care setting. Few reports describe intervention documentation as a component of doctor of pharmacy (PharmD) programs; none describe the process of selecting an intervention documentation application to support the complete array of pharmacy practice and experiential sites. The process that a school of pharmacy followed to select and implement a school-wide intervention system to document the clinical and financial impact of an experiential program is described. Goals included finding a tool that allowed documentation from all experiential sites and the ability to assign dollar savings (hard and soft) to all documented interventions. The paper provides guidance for other colleges and schools of pharmacy in selecting a clinical intervention documentation system for program-wide use.

Keywords: intervention, documentation, software, selection

INTRODUCTION

The clinical interventions of pharmacists have a positive impact on patient care and decrease cost.¹⁻¹² Intervention documentation is important for justifying pharmacists' salaries, providing information to healthcare administrators and providers, conducting performance evaluations, and tracking workload. Electronic systems for documentation of clinical pharmacy interventions are more efficient than paper systems.¹ There are several commercial products that can be used in the hospital setting, as well as software packages that allow users to build their own documentation applications.

Although the value of commercial and customized clinical documentation programs in the clinical setting has been demonstrated,¹³⁻²⁸ few studies have described use of these software applications in the academic environment of colleges and schools of pharmacy. Documentation of patient care interventions by student pharmacists, pharmacy residents, and pharmacy faculty members is important for several reasons. As colleges and schools continue to strive for more quality training sites and learning

opportunities for their students, it is important to demonstrate to administrators the value of having pharmacy students involved in patient care. Student pharmacists also need to develop the habits of providing appropriate documentation and justification of their work early in their training. Early application of documentation skills can promote this. Students also need to document learning experiences for experiential directors to assess competency achievement, and may choose to include intervention data in a portfolio for certifications, residency applications, or other employment. Having students use a personal digital assistant (PDA) database to document clinical work significantly improved their perception of the value and importance of documentation.²⁹ The 2007 Accreditation Council for Pharmacy Education (ACPE) Accreditation Standard 14 on Pharmacy Practice Experiences states that student "experiences must include direct interaction with diverse patient populations in a variety of practice settings and involve collaboration with other health care professionals".³⁰ Documentation of student clinical interventions throughout the experiential curriculum can provide schools with valuable assessment data to ensure ACPE standards are met.

Documentation of the impact of clinical pharmacy services is important to further the profession as a whole. At some clinical sites, faculty members are required to justify their presence by showing their impact on patient care. Additionally, outreach outcomes are important for

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routine performance evaluations as well as promotion and tenure of most clinical practice faculty members. However, most colleges and schools of pharmacy do not have a central database for capturing interventions at experiential locations, as students and faculty members are placed in multiple institutions with different intervention systems. For these reasons, we explored possible options for school-wide documentation of clinical interventions.

This paper describes our experiences in choosing a school-wide clinical intervention documentation system. It is intended to inform readers of the process of selecting an application to capture data describing the clinical and financial impact of an experiential program. We also provide a review of the literature of intervention documentation and outcomes from an academic perspective.

LITERATURE REVIEW

Only findings from small studies on the value of student pharmacist documentation of interventions at clinical sites have been published.³¹⁻⁴⁶ The types of documentation methods described included computer software, software for handheld devices, and online documentation systems. The clinical interventions by pharmacy faculty members and students and/or residents using electronic documentation systems have been described qualitatively and quantitatively.³¹⁻³⁶ The outcomes associated with the interventions supported onsite pharmacy education to health care institutions as a means to cost-justify academic partnerships. Additionally, the impact of academia in patient care has been described in terms of cost-avoidance relating to medication errors and potential adverse drug reactions through such documentation.³⁵

The documentation programs described in the literature either have been customized or were in place at the affiliated healthcare institution.^{31,33,34,36} Electronic systems using handheld technology or Web-based programs provide consistency and efficiency and a broad application to an entire school of pharmacy. All of the studies identified in our review were small and involved a limited number of students during pre-specified advanced pharmacy practice experiences (APPEs). None described the process of selecting a single, school-wide clinical intervention documentation system for use longitudinally by all pharmacy practice faculty members and students in both inpatient and outpatient academic settings.

SELECTION AND IMPLEMENTATION OF A DOCUMENTATION SYSTEM

Determining the Features Needed

An evaluation team was convened by the dean of the Auburn University Harrison School of Pharmacy to select a school-wide clinical intervention documentation system

to be used by students and faculty members. The team consisted of 7 faculty members from varied practice settings (eg, inpatient, outpatient) and specialty areas, including the experiential education director. The team reported and made recommendations directly to administration.

The first challenge in adopting an intervention system to serve the school of pharmacy at large was the capability to document both inpatient and outpatient interventions. Such an intervention system should accommodate faculty members in all practice settings, while providing a means of evaluating/assessing a variety of interventions associated with introductory and advanced pharmacy practice experiences (IPPEs/APPEs). The ability to customize the intervention list was a critical feature that affected our decision.

The team began by defining the purpose(s) for documenting clinical interventions at the school. Specific data necessary to achieve these objectives were considered and a list of desirable key features was developed and organized into 4 categories: documentation form, platform, exporting/reporting, and management/administration (Appendix 1).

The documentation form features are the characteristics of the tool that have the most direct impact on the users' experiences. Features should provide an easy-to-use form for all users, regardless of their role and setting. An important focus of the documentation form is the ability to quickly document interventions using as few keystrokes as possible, while capturing all the required data.

The platform features address the structure and function of the tool, focusing on the capabilities of the software. Important platform attributes allow documentation to occur from any Web-enabled device, with flexibility in terms of partial and collaborative documentation. Security of both patient and student information is also an important platform feature, as is the ability to communicate with other information systems. This last feature is not currently a reality and is a significant obstacle for colleges and schools of pharmacy with IPPEs and APPEs in a variety of locations. The core of an intervention documentation tool should be a database to allow maximum flexibility in data capture, analysis, and reporting.

The exporting/reporting features focus on the sharing of intervention data within and outside the pharmacy program. Pharmacy faculty members, administration, and students all have valid needs for accessing and sharing intervention data. Documentation tools should support these needs by providing customizable reporting and exporting functions. Colleges and schools should explore the possibility of having commercial vendors run predefined reports at predetermined times and then send the reports to the college or school. The ability to share

intervention data with experiential training sites is an important and growing need for administrators.

The management/administration features of the documentation tool support the college or school's efficient maintenance and oversight of the system. With potentially hundreds of users, colleges and schools should ensure that user account maintenance can be performed not only in batch (or by the vendor), but also by individual users (eg, the ability to update their profile). Cost and support were obvious considerations, as was users' ability to access an up-to-date drug reference. Cost was difficult to pinpoint and compare between products. Some products were available as an academic suite or integrated with an e-portfolio system and not priced separately. The commercial standalone products traditionally are marketed to institutions, and do not have set pricing for academic use. We discovered that cost could not be directly compared between products; thus, colleges/schools may need to negotiate with individual vendors. While gathering information on commercial products, team members also deliberated the option of building a customized clinical intervention documentation system. A critical consideration in the selection of any software product is the availability of technical support for updating the database and resolving technical difficulties. While this is typically not an issue with commercial software products, it is a vital concern when purchasing a customized product.

Handheld devices. There was considerable deliberation on identifying a product with versatility of working with handheld devices. Over time, the perspective shifted from selecting a product with this capability to a greater value being placed on the overall efficiency characteristics in the documentation process. For there to be buy-in from practice faculty members, the product needed to be as user friendly as possible. The clinical intervention documentation system that was chosen is Web-based with handheld versions available. Colleges and schools should determine the compatibility of potential products with the current generation of portable devices, including smartphones and tablets. All of our users enter their interventions using the Web-based form and there have been few complaints by faculty members and students regarding this method of documentation. The Web-centric nature of the tool is a primary strength for our usage because it allows documentation from any device that has an Internet connection and Web browser. Feedback from faculty members and students indicated that due to the workflow in patient care, it is often typical and preferred to document interventions at a later time, rather than during patient care activities. They preferred to have an application with a variety of entry points and the ability to access it from multiple Web-enabled devices.

Tools included in PIMSS. Typically, some intervention tools are existing components of pharmacy information management systems (PIMS) that integrate with a hospital's clinical information system. These integrated systems and other similar interfaced systems can present clinical data housed within the hospital clinical information system to the pharmacist to help identify potential interventions for subsequent evaluation and documentation. While a system's ability to automatically present pre-sorted data to users is valuable, the technical complexity, administrative logistics, and financial costs of interfacing a documentation tool with literally hundreds of experiential training sites would prevent/prohibit most colleges/schools from pursuing this option, as it did our school.

Researching Software Options

Once the needs assessment was complete, the team began researching potential software products in the literature, on the Internet, and at national pharmacy organization meetings. The team also considered recommendations elicited from practice-based listservs (eg, practice and research newtorks, special interest groups), pharmacists practicing at experiential education sites, and personal experience.

After potential products were identified, the features of each program were critically analyzed for practical utility in the academic setting and a pro/con list for each product was developed. Table 1 lists institutional goals for documentation and the corresponding desirable features of each program. The assessment process was expanded through online product demonstrations and personal product testing by faculty members via temporary access to products. Based on the information gathered, the team narrowed the list of potential clinical intervention documentation software systems and presented the results to school administrators. Table 2 lists sample commercial intervention documentation tools and database development applications that can be used to develop homegrown intervention documentation tools. It does not include intervention tools that are components of PIMs because a college or school of pharmacy would not normally purchase these tools independent of a PIMS.

Product Selection

The desired features and goals of a school-wide intervention documentation tool vary for each institution. Some intervention documentation products will be easily eliminated as possibilities if they do not have critical features to meet the school's goals. The vision of our school of pharmacy was to adopt an intervention documentation tool which would serve to describe the patient care activities of the school as well as a means to educate and incorporate

Table 1. Clinical Intervention Documentation Goals and Representative Corresponding Key Features

Goal(s) of Documentation	Key Features Supporting Desired Goal(s)
Financial Justification Faculty Students Residents	Fits multiple practice settings; MTM CPT, NPI; time spent; financial impact; outcomes; database foundation; interface with other information systems; report customization; benchmarking; automated report distribution
Education	Integration of supporting information; fits multiple practice settings; MTM CPT, NPI; time spent; financial impact; outcomes; partial documentation; start and forward; HIPAA and FERPA compliant; benchmarking; automatic notifications; automated report distribution; e-portfolio interface; multiple user profiles
Assessment Performance (faculty, students, preceptors, sites) Outcomes (curricular, accreditation, pharmacy services, patient) Workload	Data customization; required fields; fits multiple practice settings; time spent; financial impact; outcomes; database foundation; searchable free text notes; report customization; benchmarking; e-portfolio interface; export to sites' intervention systems
Efficiency	Field name customization; data customization; ability to hide field/sections; efficient entry; required fields; ease of use; speed; mouse over for information; web-based; customization of user interface; partial documentation; start and forward; pre-population of data; communication with users; support; drug database

Abbreviations: MTM = medication therapy management; CPT = current procedural terminology; NPI = national provider identifier; HIPAA = Health Insurance Portability and Accountability Act; FERPA = Family Educational Rights and Privacy Act

pharmacy students on the importance of this process. In consideration of all of the features of the intervention system, coupled with the goals of the academic program in using such a system, there has been much reflection and subsequent continuous quality improvement associated with our use of the current tool. While e-portfolios are growing in importance among pharmacy programs, existing commercial intervention tools for acute care settings are not designed to share data with e-portfolios. Additionally, there is inconsistency among the large, academic software suites in terms of providing an intervention documentation component that integrates with the suite's

e-portfolio module. Schools should carefully evaluate any demonstrations of this feature.

After discussing and ranking the desired features and soliciting input from school administrators, we chose Quantifi (Pharmacy OneSource, Bellevue, WA) because it fit our needs, we had an existing relationship with the software provider, and we did not have the time and resources to develop a custom tool. As with other commercial intervention documentation tools, Quantifi is designed to support documentation of pharmacists' interventions in the acute care setting. The majority of inpatient interventions that we would use already were

Table 2. Example Intervention Documentation Tools

Type and Name	Web Site URL	e-Portfolio Integration
Commercial		
eValue PxDx Case Logger	https://www.e-value.net/home/features_pharmacy.cfm	Yes
Gold Standard Clinical Measures	http://www.goldstandard.com/pages/clinicalMeasures.html	No
PharmAcademic PharmPortfolio	http://www.mccreadiegroup.com/home/Products/PharmAcademic/tabid/68/Default.aspx	Yes
Pharmacy OneSource Quantifi	http://www.pharmacyonesource.com/applications/Quantifi	No
Custom		
Microsoft Access	http://office.microsoft.com/en-us/access	N/A
FileMaker Pro	http://www.filemaker.com	N/A
MySQL	http://www.mysql.com	N/A
Lotus Approach	http://www-01.ibm.com/software/lotus/products/smartsuite/approach.html	N/A

Abbreviations: N/A = not applicable

included in Quantifi; however, the outpatient interventions required substantial development. We were aware of this limitation as it was common across all of the software applications we considered. In our school, Quantifi serves the distinct purpose of intervention documentation and is separate from our e-portfolio system.

Implementation

At Auburn University Harrison School of Pharmacy, Quantifi is used both administratively and academically. As part of their performance evaluation, all pharmacy practice faculty members are expected to document and annually report their patient care activities (quantitatively and financially) using this system. Such information is helpful in discussions with associated health systems and pharmacies. The data are used to demonstrate the outreach efforts by full-time faculty members and justify these positions or potential new positions, and to describe the school's clinical and financial impact for institutions that do not have an intervention documentation system. Additionally, the information is annually collated and reported to the university at large to demonstrate the collective outreach services by the school of pharmacy.

The documentation system is used in IPPE and APPE programs to acclimate the students to the process prior to their fourth year. In the first 3 years of the longitudinal IPPE program, students document interventions associated with identification of medication-related problems under the guidance of faculty members. In the fourth academic year, pharmacy students are required to document patient care interventions on all patient-care APPEs regardless of practice setting or preceptor. This information is reviewed periodically by the director of experiential learning and regional faculty coordinators to ensure that documentation is occurring and that it is accurate. These data can then be shared with affiliate preceptors and practice sites upon request. Full-time faculty members have the opportunity to use the documentation system to proactively explain the level of professional service in the patient care setting, as well as to review with students the quality of interventions and provide feedback related to professional performance over the course of the APPE. At times, a percentage of their APPE grade is dedicated to these interventions to describe the value of their work and mirror an actual performance evaluation. By participating in this process, the students also learn about the cost-avoidance measures associated with their patient care activities.

DISCUSSION

Several aspects/features of Quantifi have been important to our success. The ability to customize the application

to match our academic and professional documentation needs has been essential for our institution. We have been able to demonstrate the interventions by individuals (faculty and staff members) as well as the IPPE and APPE programs. The flexibility of the intervention list allowed us to develop a documentation form that represented the documentation needs of our school. Also, the time required to complete documentation using Quantifi is minimal, which is crucial given the time constraints encountered in practice settings and in pharmacy practice experiences.

The current intervention system has been in place at our school for more than 3 years and during this time many modifications have been implemented as a result of use and continuous feedback by faculty members and students. From an intervention entry perspective, the intervention list has been reduced to eliminate duplication and confusion due to subtle differences. Additionally, measures have been taken to expedite the documentation process for repetitive tasks, and account for professional services related to outpatient visits and missed opportunities (eg, chart review and patient no-shows). Also, much time has been devoted to the review of reporting by fourth-year APPE students.

There have been several efforts to improve the consistency of documentation by faculty members and students. Prior to fourth-year APPEs, students are instructed on how to document their patient care activities by the director of experiential learning using scenarios and then again by full-time faculty members during individual APPEs. All faculty members attend an annual training session to ensure consistency, review any changes or customizations made, review training scenarios, and solicit feedback.

Initially, the reporting feature allowed individual faculty members to retrieve desired quantitative and qualitative information pertaining to their patient care interventions. Because of the way data were entered by APPE students, however, retrieving faculty or preceptor-specific data that was entered by students was nearly impossible. In June 2010, the way in which data were entered by the APPE students was modified. This allowed the retrieval of student-entered data associated with specific faculty members or preceptors. Currently, the vendor provides monthly reports to the school which can be sorted to provide specific intervention data and cost savings data in aggregate or for specific faculty, students, or practice sites. Manipulation of these reports requires experience with and knowledge of pivot tables, which we had to develop through technical assistance from Pharmacy OneSource. This has improved our ability to provide outcomes data to affiliate preceptors and health-systems partnering with the school of pharmacy. Other maintenance aspects, such as updating the

drug database, must be performed manually by Auburn personnel as the software company does not provide this service.

CONCLUSIONS

The process of choosing a school-wide clinical intervention documentation system requires a systematic, multi-step process and many factors must be considered. The implications of choosing and implementing a system to meet the specific needs of a college or school of pharmacy can be far reaching. Data obtained may be used to justify faculty positions, solicit new experiential training sites, be included in student and faculty portfolios, be considered in faculty evaluation processes, and be distributed to multiple stakeholders. The steps in selecting an application to capture data describing the clinical and financial impact of an experiential program include assigning a team responsible for recommending a product, developing the goals for using the product, developing a list of desired features, identifying and reviewing available products, making recommendations to the decision maker, and negotiating with the vendor. After implementation, we recommend continued evaluation of the system and how it is used, as well as longitudinal training for faculty members and students.

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Appendix 1. Desired Features of an Intervention Documentation Tool

Category	Feature	Description
Documentation Form	Field name customization	Field names define the type of information being collected. The ability to modify field names allows tailoring of the form to a school's current and future needs as well as to any terminology unique to a school.
	Data customization	The most important part of the tool is the ability to capture desired data. The tool should allow complete customization of the selectable data elements, as well as the ability to use free text when appropriate.
	Ability to hide fields/sections	Documentation tools should provide the ability to document any pertinent information for an intervention. A valuable feature allows less commonly used fields or sections of the form to be displayed only when selected by the user during documentation.
	Nesting	Fields are displayed based on selections for previous fields.
	Efficient entry	Speed is a critical factor. Forms should utilize drop-down lists, radio buttons, and other methods to decrease time to complete documentation.
	Integration of supporting information	Forms should include any available patient information, drug information, calculators, clinical guidelines, protocols, formulary information, etc. to support users' information needs.
	Required fields	The tool administrator should have complete control over which fields are required and which ones are optional, according to user profiles.
	Fits multiple practice settings	Faculty practice sites and student APPE sites vary considerably. Forms should be flexible enough to fit the needs of the range of sites.
	MTM CPT, NPI	Even though billing may not occur, the form should include documentation of MTM CPT code(s) and NPI number(s) to demonstrate pharmacists' contributions and to inculcate in students the importance of documentation as pharmacy's role expands.
	Time spent	The importance of demonstrating how much time faculty and students spend performing interventions may vary across schools. Despite this variability, a documentation tool must include time as a component of each type of intervention and should be customizable.
	Financial impact	Each type of intervention should have a customizable hard and soft financial attribute. Schools should recognize that, due to the wide variability in experiential training sites, use of an average value (based on the literature and/or local data) may be the most efficient way to determine program-wide impact.
	Ease of use	Clearly, large numbers of users will depend on the documentation tool. Software demonstrations and hands-on trial periods should focus on assessing the ease with which users can navigate the tool and ultimately document the appropriate information.
	Primary and secondary interventions	Pharmacy practice often involves performing a primary intervention that has one or more associated secondary interventions. Documentation forms should support the association of primary and secondary interventions. The intervention list should be fully customizable.
	Outcomes	Documentation tools should include the ability to record the patient's outcome(s) as related to the intervention(s). Outcomes are often not known when interventions are documented. Tools should allow subsequent updating of outcomes as well as indicating that the outcome was not known.
	Speed	The actual time to enter intervention information should be as short as possible. In addition to other methods described, forms should require limited user clicks and be limited to as few screens as possible, preferably a single screen.

(Continued)

Appendix 1. (Continued)

Category	Feature	Description
	Mouse over for information	Forms should allow users to put their cursor (or other pointing device, including their finger) over a form element (e.g., field name) for explanatory information about the element.
Platform	Web-based	The IT market (including health care) is moving toward a Web-based model. To meet the needs of a variety of users, a Web-based application will allow a standardized experience across all hardware and operating system platforms.
	Customization of user interface	To create a consistent user experience regardless of the practice or experiential training setting, the tool's interface should be modifiable to display the school's logo (or other brand element) for all users.
	Database foundation	At its core, the documentation tool should be built upon database structure, allowing maximum flexibility for data capture, analysis, and reporting/exporting.
	Partial documentation	Flexibility of the form should allow users to complete as much or as little of an individual intervention documentation, stop and save what has been documented, and complete the documentation at a subsequent time. Automated, user-defined reminders allow the user to determine when and how they will be prompted to complete the documentation.
	Start and forward	Similar to partial documentation, documentation tools should allow users to initiate documentation and then send it to someone else for subsequent review, modification, and/or completion. The original user should be able to follow-up on the intervention to see what was documented.
	Searchable free text notes	While forms should focus on capturing structured data to the fullest extent, some situations will dictate free text entry. Any free text fields should be searchable. Permissions (user profiles) determine the scope of preceptors', students', and administrators' searches of others' documentation.
	HIPAA and FERPA compliant	As a clinical information tool, intervention documentation applications must comply with HIPAA regulations. Additionally, FERPA regulations should also be followed to ensure the privacy of students' information. School policies and procedures are an additional measure to ensure that HIPAA and FERPA violations do not occur.
	Interface with other information systems	The United States is moving toward a nationwide, fully connected health care infrastructure that allows electronic sharing of patient information across locations and episodes of care. In similar fashion, a documentation tool <i>should</i> interface with information systems at practice and APPE rotation sites to provide real-time access to patient specific information. In reality, we are many years from this occurring as the challenge of connecting a documentation tool with dozens of APPE rotation sites presents significant technical, administrative, and financial barriers.
	Sign off	The tool's administrator should have the ability to define a period of inactivity after which users are automatically logged off.
	Pre-population of data	As described above, interfacing with other information systems is a goal that is unlikely to happen in the near future. While the lack of this information exchange prohibits pre-population of forms with patient-specific data, documentation tools should be pre-populated with as much data as possible. This can include the date, name of the user, APPE site, preceptor (where appropriate), and other information desired by the school.

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Appendix 1. (Continued)

Category	Feature	Description
Exporting/ Reporting	Report customization	The documentation tool administrator should have full capabilities to create customized reports describing the school's impact. Deans, department heads, directors, and other administrators will also need report generation capabilities to support their administrative responsibilities. These data may be especially useful when experiential training sites request payment for taking students. Students will need to generate reports of their activities (in the absence of an e-portfolio interface), and preceptors will need to be able to generate reports demonstrating their direct contributions as well as the contributions of their students. All reports should be standardized across the school and should be available in a variety of formats. Desired customizable reports may include: <ol style="list-style-type: none"> 1. APPE rotation site specific financial impact 2. School-wide financial impact 3. Counts of intervention types 4. Interventions by user 5. Patient outcomes
	Benchmarking	As more pharmacy programs begin using documentation tools, a benchmarking feature would allow programs to measure their contributions against similar programs. Individual users will be able to compare themselves to similar (non-identifiable) users both within and external to their program. Additionally, through benchmark data, the profession will demonstrate its impact across the nation.
	Automatic notifications	Some interventions are critical in nature and may require immediate follow-up by clinicians. The tool should allow an automatic notification to be assigned to these interventions. The notification would be sent to a specific person whenever the intervention is documented (usually by a student).
	Automated report distribution	Users should be able to – after defining a report – schedule to automatically receive the report in the desired format(s).
	e-Portfolio interface	A growing emphasis is being placed on professional portfolios for students and faculty members. Intervention documentation tools should interface with e-portfolios. Ideally, this integration will allow the user to define how (manual vs. automatic) and what (data) is included in the portfolio, all guided by the parameters established by the documentation tool administrator.
	Export to sites' intervention systems	Pharmacy programs will continue to be challenged with demonstrating their impact at the many locations that provide experiential training sites. Documentation tools should allow flexibility in exporting data that can be provided to APPE sites for inclusion with their internal documentation tool (if one is in place). Some sites may want PDF documents, while others may want a database file that can be merged with their existing data, a pre-populated presentation file, or charts and graphs. The tool should be flexible enough to meet the variety of needs.
Management/ Administration	Multiple user profiles	A critical feature is the ability to establish and customize multiple types of user profiles. These profiles control permissions and functions of each user type, including reporting, default documentation form fields and sections, access to other users' data, reporting, system maintenance, etc.
	User account management (administrator)	Account management should be centralized within the program. The school's documentation tool administrator(s) should be able to perform batch updates to user accounts (adding, inactivating/suspending, and deleting). Administrators should also be able to manage individual accounts and define a duration of activity for accounts (individual or batch), indicating how long the account is active.

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Appendix 1. (Continued)

Category	Feature	Description
	User account management (individual)	Account management at the individual user level is also a requirement. Users should be able to reset their passwords and contact information without requiring help from the administrator.
	Communication with users	The tool should provide a mechanism to communicate with users. This mechanism should allow the administrator to create and send messages to all, one, or a partial group of users. Users will define how they want messages to be delivered (email, pop-up when signing in, text message, etc.)
	Support	The vendor (of commercial systems) and/or the designated group within the school (for homegrown systems) should be available to users through multiple channels (phone, email, chat, FAQs, etc.) to address training and support needs as they arise. A forum for users to post questions and answers would also be helpful.
	Cost	The cost of the system (purchase, set-up, and maintenance) must be consistent with the financial means of pharmacy programs. Commercial systems that are not part of an academic suite are designed for hospital use and hospital budgets. Negotiations with the vendor may be necessary. For homegrown systems, costs can include personnel costs (in the form of initial and maintenance programming hours) and hardware/server and software acquisition fees.
	Drug database	Drugs are commonly included in documented interventions. A searchable drug database that is included on the documentation form allows quick identification of correctly spelled medications, which is critical for accurate reporting and data analysis. Schools should determine if a searchable drug database is available among documentation tool alternatives, and if a database is available, who is responsible for keeping it up to date.

Abbreviations: APPE = advanced pharmacy practice experience; MTM = medication therapy management; CPT = current procedural terminology; NPI = national provider identifier; IT = information technology; HIPAA = Health Insurance Portability and Accountability Act; FERPA = Family Educational Rights and Privacy Act; PDF = portable document format; FAQs = frequently asked questions;