Standards, Security and Usability: Experience with *MyMedicationList*

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MyMedicationList

MyMedicationList is a prototype application developed at the National Library of Medicine for users to manage their medication profiles, namely to store, update, add and delete medications from their personal medication lists. The application keeps a record of current medications as well as prior medication history. Such a personal medication list can be printed out and serve as a reminder to the individual for taking medications, as well as reference information to support continuity of care at doctors' offices or hospitals.

This individual electronic medication list is a specialized type of Personal Health Record (PHR). It is envisioned that developers of a more general PHR might wish to incorporate *MyMedicationList*, which is open source, as part of their PHR. In order to accommodate that possibility, *MyMedicationList* aims to adopt standards amenable to widespread adaptation, as well as to protect privacy and enhance user experiences.

Standard data format

MyMedicationList stores medication profiles in the format of Continuity of Care Document (CCD) [1], a standard derived from HL7's Clinical Document Architecture (CDA) and ASTM's Continuity of Care Record (CCR) specification. It is a set of structured XML tags approved by HL7, endorsed by HITSP for clinical information exchange. During the process of selecting a standard, we examined other data models including Indivo and OpenMRS. CCD stood out as the best candidate as it represents all the elements for a medication activity. For example, it can specify the generic counterpart of a branded drug, which is useful for pharmacists when filling out a prescription in which the generic substitute for a branded drug is allowed. This structure facilitates a variety of decision support possibilities, including checking to insure that both branded and corresponding generic drugs are not on someone's current medication list. We use *RxNorm* [2] as a standard vocabulary for drugs.

Secure user environment

Security and privacy remains a primary concern for potential users of a PHR. There are numerous Internet-based PHR systems, in which patient information is stored by the systems. In this model, because external entities hold patient records (databases of the PHR systems), users may worry about improper access of their PHRs. *MyMedicationList* runs on users' personal computers, storing all personal information, including the medication profiles, locally on the users' computing devices. Because records are stored locally, users remain in control of their personal information and can decide with whom to share it.

Usability of the interface

Usability is crucial to adoption and implementation of all types of information technology innovations. The adoption and effectiveness of PHRs will depend as much on system and user interfaces as on the data in the records [3]. *MyMedicationList* follows general usability guidelines and addresses particular user needs in a PHR setting. Data entry is facilitated by an auto-completion mechanism, allowing the user to select a generic or branded name and the corresponding drug and code in *RxNorm*. Related information, including start/stop date, frequency and instructions, is entered with widgets such as drop-down lists or formatted fields. Other useful knowledge, such as prescribing information and lists of adverse reactions, are available through a link to *DailyMed* [4], an NLM website that provides information about marketed drugs, including the FDA approved labels, as well as links to other information sources.

Conclusions

We believe it is possible to follow the existing and proposed standards in building a PHR. A common-sense approach to usability and to security appears to supply a practical working model capable of either standing alone or being incorporated into a more general PHR.

References

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