Improving Patient Experience: Sharing patient data for medication management

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Previously we have written about the importance of patient engagement and activation to improve patient health outcomes. Along with outcomes, the patient experience is enhanced through a collaborative approach with their care team and tools to support monitoring and positive health behavior changes. We have also talked about the need for providers to have timely and accurate information regarding patient health. Both collaborative communications and data sharing specifically related to medication use are fundamental components of improving the patient experience.

Appropriate medication use is essential for managing many chronic conditions, including diabetes, asthma and heart disease. However, there is not a simple solution to ensure patients receive the prescriptions, education, and support needed to maintain the desired medication therapy. Medication therapy management is a complex issue that encompasses: 1) evidence-based clinical guidelines for the pharmaceutical management of the condition, 2) provider prescribing the recommended medication and the correct dosing, 3) provider verifying the patient is not taking any contraindicated medications, 4) the patient obtaining the prescribed medication, and 5) the patient taking the medication as prescribed (and continuing to do so for the duration of therapy). Getting all of these steps right is critical to optimal medication therapy management and to avoid issues such as:

- **Polypharmacy** -taking five or more medications, many for the same condition. This can lead to an increased incidence of drug interactions, side effects, and adverse reactions.
- **Medication errors**– not using a medication as intended is a significant source of harm.
- **Patient adherence** -lack of adherence often results in suboptimal disease control.

Medication Therapy Management

A study published in the American Heart Journal reported that approximately 20% to 30% of prescribed medications were left unfilled, and after starting a medication, patients do not continue treatment as prescribed in about 50% of the cases[1]. Between $100 and $300 billion of avoidable health care costs have been attributed to nonadherence with outpatient medication therapies in the US annually, representing 3% to 10% of total US health care costs[2]. Patient adherence to medications that are recommended in clinical performance guidelines tends to be low. Identification of inappropriate prescribing, drug interactions, patient allergies, and prescription underuse are essential components of medication therapy management.

The process of medication reconciliation should occur at the time of each medical visit. Providers tend to track prescribed medications - at least ones THEY prescribed- but may not know what other providers have prescribed. Providers typically do not know whether prescriptions were filled (or refilled). Patients are in a position where they must recall and self-report medication use. Inaccuracies in knowing the "truth" about what medications are consumed and with what frequency/dosage makes it difficult to interpret clinical/laboratory values and make a determination regarding whether prescription modifications are needed to improve the outcomes of therapy (i.e., Is the prescribed medication a sufficient dosage to have desired clinical effect? Or, is the patient not taking the intended dosage?).

Within the area of medication therapy management, there is tremendous opportunity for improving patient-centeredness to encourage adherence to prescribed therapies which will improve clinical outcomes. While essential to successful outcomes, the patient is greatly underutilized in the process. This suggests an opportunity for patient-contributed data through digital engagement, and use of self-care tools and technology that support medication adherence and other disease management activities[3]. The key to achieving optimized medication therapy management involves improved communication between patient and providers including complete, accurate and timely sharing of patient data regarding actual medication use.

Patient experience with medication therapy management

When patients are discharged from the hospital, they are often still very sick and may have multiple medication changes, some of which are temporary and some which will be required for ongoing management of a condition. While this may not be the appropriate time to have in-depth discussions about each medication, discharge instructions and education on medications is vital to preventing readmission. Communicating at the appropriate time for the patient, when patients/caregivers are ready to learn more, often does not occur.

Inappropriate prescribing of medications, medication errors and other problems with medication use also represent a significant source of harm for people receiving care at home. It is estimated that as many as 40 percent of recipients of home health care experience a medication error or other drug therapy problem[4].Often patients forget which medication is supposed to help them in which way.

Inappropriate polypharmacy and the use of inappropriate medications have been identified as two of the primary underlying causes of medication-related harm in the home. Other issues include improper dosing; confusion about medication orders and names; and poor medication adherence due to economic, access, or social factors[4].

Recent studies have concluded that medication non-adherence is reaching the level at which it should be considered epidemic[9]. The burden of this epidemic is the heaviest on individuals who suffer from chronic conditions such as Type II diabetes and hypertension[10]. Even though evidence-based clinical practice guidelines exist to recommend prescription medications to manage chronic illness and reduce hospitalizations[11], the need for progress on medication therapy management could not be more urgent.

With the shift from fee for service to value-based or risk-based insurance arrangements, it was expected that physicians and pharmacists would work together using a team-based approach to treatment to

proactively address medication-related needs. However, the care team seldom has complete and up to date information regarding prescriptions and actual use of medications.

The "Source of Truth"

Medication reconciliation is time consuming, confusing, and often fraught with errors. Primary care providers and specialists treating the patient may each have a somewhat different list of "active medications". Although providers must spend additional time and effort to update the meds list, the updated/reconciled medication list may not get communicated to other providers – and so the burden is passed on again to each subsequent provider. It is unclear who has the latest and most accurate medication list – that is within the medical record. Gaps often exist in having a comprehensive view of actual medication use. Patients often attempt too much of the work of medication reconciliation themselves as they see multiple physicians and specialists. This amounts to the patient acting as their own health information exchange (HIE), transferring manual lists from provider to provider in an attempt to achieve a medication list that is "the source of truth".

Communication among Providers

It is clear that patient experience with medications requires improved communication between patient and providers and also among the entire care team to optimize medication use. This includes communication between physicians and pharmacists as well as pharmacists and patients.

The involvement of the pharmacist in this process varies considerably depending how their role is defined by the health system. Traditional pharmacist roles focus on the filling and dispensing of prescriptions with some patient education and advice provided. At the other end of the spectrum are accountable care organizations (ACOs) that are at risk for patient outcomes and treatment costs. These ACOs often have pharmacists designated as the experts in medication therapy who are assigned to proactively monitor patient medication therapy for enrolled patients, leveraging pharmacy expertise in optimizing the potential of medication therapy. These pharmacists provide medication reconciliation at transitions of care and may communicate with patients routinely to proactively address patient questions and issues with medication therapy. Some retail pharmacies may provide a web-based tool for pharmacists to identify patients not refilling maintenance-type of medications and list the phone number where the patient could be reached to conduct "adherence calls." A drop-down menu indicating the result of the phone call, e.g. "Will refill prescription," "Medication discontinued," or "No answer." Is used to record results. Another approach used sends refill reminders to patients' email or phone. This requires pharmacists to obtain email addresses when the patient initially fills a prescription.

Other retail pharmacies use a local patient medication profile such as RxCompanion, a web-based tool to identify patients that qualify for MTM services.   This tool captures notes on the conversations that occur between the pharmacist and patient.

While both tools are well-intended, they raise issues for the pharmacist workflow which is still very manual. They do not include algorithms that produce alerts and these tools are not integrated with other patient care systems. The pharmacist must set aside time to make adherence phone calls, and the patient must be receptive to make behavioral changes when it comes to drug therapy. Given the typical

lean staffing models for retail pharmacies, the pharmacist may be hard pressed for time to conduct adherence phone calls.

Timely access to information about medication-related issues can prevent adverse effects to the patient or higher costs to the organization in the form of readmissions and emergency department visits. These services are known as medication therapy management (MTM) services. The authority of pharmacists to address the medication therapy issues varies by state and provider organization. At a minimum the pharmacist will communicate the issues to the physicians and seek resolution of the therapy problems. In some states the pharmacist has the authority to change medication orders directly then inform providers about medication changes.

Tools for Sharing Patient Data

Currently, there is no consistent method or tool used to share patient data among all providers on the care team and there is much opportunity across all parts of the care continuum to improve patient experience for medication therapy management.

A truly patient-oriented data sharing architecture is elusive in real-world practice today. The sources for data about a patient are typically:

1. Electronic health records (EHRs) from each of the providers taking care of the patient. They may communicate to each other or to a Health Information Exchanges (HIE) to share data. HIEs provide another tool for sharing patient data and may also consolidate data from multiple provider EHR systems and pharmacy claims from payers. This is limited to information from "prescribed" lists from the providers, and possibly "filled prescriptions" from the pharmacy/pharmacy benefits manager (PBM). HIEs can also share problem lists, diagnoses and test result information from the multiple provider systems. Some EHRs and other prescribing and dispensing systems transmit insurance transactions through the Surescripts System so that providers can also see which prescriptions were filled (and refilled). Unfortunately, only prescription medications that are paid wholly or in part by insurance are available from this database (excludes self-pay and over-the-counter [OTC] medications).This data is also not readily available to all participants in the process[5].
2. Patients may share data with providers through patient portals. Typically, each provider group has its own portal, so portals do not reliably foster sharing of data between providers. Portals are often used by patients to communicate with the practice to coordinate appointments, pay bills and view clinical information such as laboratory results. Some portals may also enable provider communication by accepting care-related messages from patients. Adoption of portals has been variable. Athenahealth reports a 25% adoption rate across 1100 fee-for-service provider groups. Kaiser Permanente reports about 70% patient portal adoption. Group Health Cooperative (Seattle, WA) reports 73% of enrollees in Group Health Practices are registered and ID- verified to use its patient portal website as well as its mobile app. However, registration rates and ID verifications do not account for the people who register but do not actively use the portal.[7]
3. A third type of tool being used to share health related data captured by the patient involves using connected digital devices that send data to providers over the internet. These devices

allow the patient to digitally collect basic vital sign information such as blood pressure, heart rate, exercise and more complex information such as blood glucose levels and transmit that information to various electronic databases for patient and provider use. Mobile Health (mHealth) applications provide a variety of functionality such as: drug information, drug interactions, provider communications, prescription administration reminders, and refill requests. These applications have typically been used most successfully by young and middle-aged adults, not the most infirmed elderly – who are at highest risk of medication-related issues. Underuse of mHealth applications raises questions about usability of these tools by the elderly as well as the benefits for the patient and the care team. One approach that has proven effective with successful adoption of mHealth apps is the gamification of use of the application. This approach involves integrating game mechanics to promote the app – such as providing incentives and introducing competition into eligibility criteria for using the app and adhering to medical recommendations and recordkeeping use of the app. Initial studies have shown that gamification techniques are most effective on males with post-secondary education[6].

Ultimately, some important information is available only from the patient such as: actual med administrations, minor side effects, OTC medication and dietary supplement use, vital signs and other physiological data captured by analog devices (e.g. traditional scales, blood pressure cuffs). While tracking and self-monitoring information has become an accepted practice for some patients, it is often information that remains with the patient, and is often not shared with the care team. Self-monitoring is not communication of information unless it is shared with all of the care team, including providers and pharmacists.

Recommendations for a Patient-Oriented Data Sharing Architecture

Rather than providers assuming that not hearing concerns from patients means that recommended therapies are being followed, use of automated tools and proactive communications from the care team are needed in order to support patients with medication adherence and other disease management activities. This may include checking in with identified patients and reviewing labs results to see what the effects of medications are (are they working as intended?). Patients require access to a convenient and credible source of information related to medications and personalized education.

There are several components of a patient-oriented data sharing architecture that can be used to improve communication and share data electronically across all care providers.
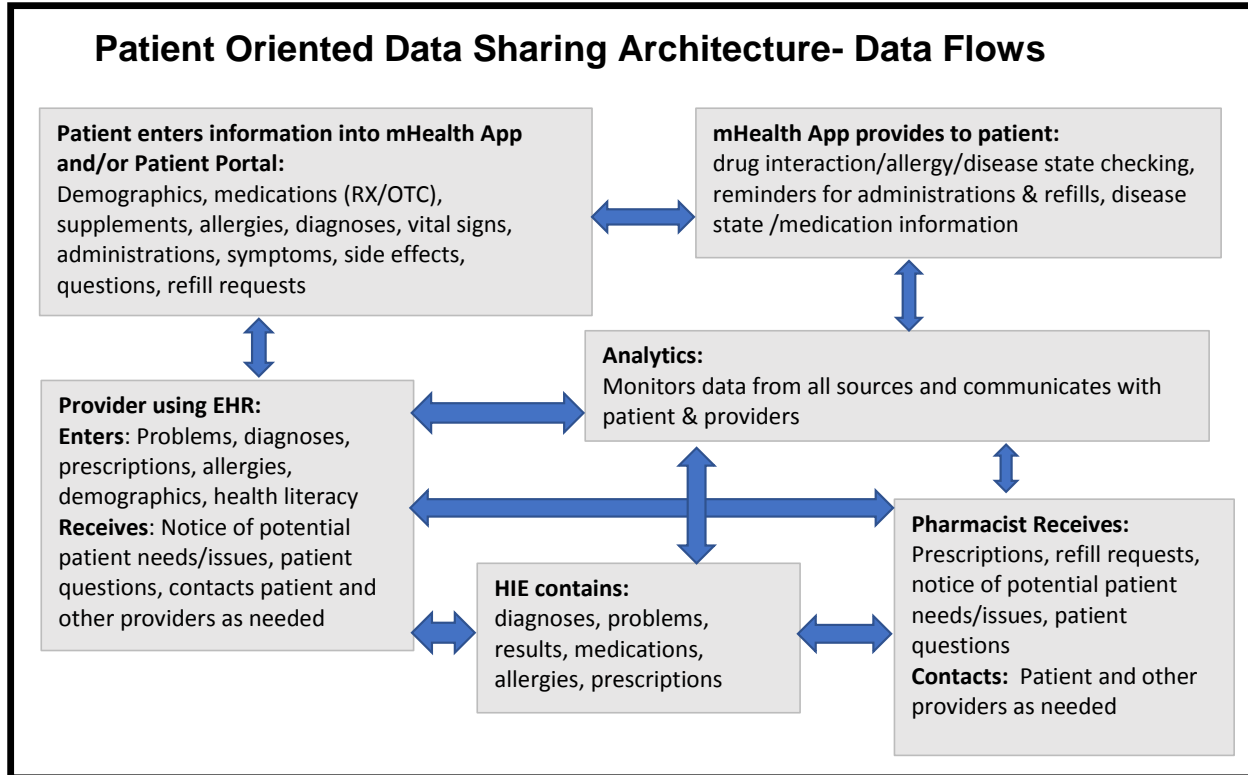
Patient Oriented Data Sharing Architecture- Data Flows

Patient enters information into mHealth App and/or Patient Portal:
Demographics, medications (RX/OTC), supplements, allergies, diagnoses, vital signs, administrations, symptoms, side effects, questions, refill requests

mHealth App provides to patient:
drug interaction/allergy/disease state checking, reminders for administrations & refills, disease state /medication information

Analytics:
Monitors data from all sources and communicates with patient & providers

Provider using EHR:
Enters: Problems, diagnoses, prescriptions, allergies, demographics, health literacy
Receives: Notice of potential patient needs/issues, patient questions, contacts patient and other providers as needed

Pharmacist Receives:
Prescriptions, refill requests, notice of potential patient needs/issues, patient questions
Contacts: Patient and other providers as needed

HIE contains:
diagnoses, problems, results, medications, allergies, prescriptions

Figure 1 – Patient Oriented Data Sharing Architecture – Data Flows

1. Mobile health applications (mHealth apps) can be used to share patient generated data. Functionality for an app must support three main objectives:
   a. Managing and monitoring patient self-care
   b. Bi-directional communication with provider; ideally communication could allow patients to obtain feedback on their medication regimen (or link in the provider or pharmacist, if there needs to be a med adjustment, or to address further specific questions such as the purpose or need for the meds).
   c. Combination of health-related data from the patient, provider and other sources (e.g. laboratories, payers, outside providers)

Design of mHealth apps must consider patient preferences. Mechanisms must be in place to repeat and reinforce medication instructions and education when patients and their caregivers are ready for more information. The following functionality is important for improving medication adherence through a mHealth app:

o Medication administration reminders: when, how much, how to take
o Request for refills and authorization for additional refills
o Access to medical/medication information in patient friendly language: side effects, drug interactions, disease state descriptions
o Ability to tailor for patient preferences:
   ▪ Communication mechanisms (text, e-mail, App)

- Language preferences
- Display preferences (e.g. font size)
  - Ability for the patient to send questions and patient generated information (e.g. symptoms, quality of life, vital signs, pain scores, manually gathered information: weight, blood pressure)
  - Documentation of patient adherence to the prescribed medication regimen

2. Data from provider EHRs which is often available through an HIE can also contribute to improving the patient experience with medication management. Sharing lab results and other treatment and outcomes data can provide an important link between medication therapies and outcomes.

3. Analyzing patient-collected and provider data provides the mechanism to monitor medication usage patterns for signs that the patient has issues with the therapy in terms of: side effects, adherence or effectiveness. Analytics may trigger alerts to the care team, which enables the practice to determine when issues should be referred to the provider for follow-up. If properly designed analytics can generate alerts that are actionable, incorporated into the workflow and useful to the provider, and not create low value alerts that are of little use. This technology makes it possible to address concerns proactively, eliminating work flows that notify the care team of adverse events or failures of treatment when it is too late to intervene.

4. Social determinants of health data can allow us to identify patients who are more likely to have adherence issues based upon factors such as health literacy, socioeconomic status, education levels and demographics[7]:

Conclusions

There is tremendous potential to improve the patient experience of medication therapy through increased patient involvement in the process. In addition to improving the patient experience, patient engagement has the potential to reduce the costs and improve the effectiveness of therapy through increased patient adherence to prescribed treatment regimens. One promising approach is the use of mHealth applications as a tool to communicate with providers and provide information and reminders to the patient. Proactive monitoring of the medication therapy by a pharmacist who is specifically tasked to do so, supported by appropriate technology can help to avoid significant issues with medication therapy. Analytics can provide the tools to collect and analyze data from the multiple sources (patient, providers, and pharmacists) and ensure that monitoring for indicators of medication therapy issues is ongoing and occurs in near real time. This will allow providers to efficiently and effectively respond to signs of potential therapy issues, without a lot of alerts that do not provide valuable information.

Sum-IT Health Analytics provides custom analytic solutions to align with your patient care methodologies and clinical workflows. These solutions integrate your data from disparate sources and turn it into actionable information that can be used to improve the success of medication therapy through improved patient adherence and by helping to connect the key participants in the medication management process.

How We Work with Clients

At Sum-IT Health Analytics, we use a public health approach to help our clients become data-driven and engage in transformative interventions. Our leadership team has extensive experience in public health, consumer and patient engagement, performance measurement, clinical quality improvement, medication therapy management, and change leadership. We create custom analytic solutions to address key patient engagement and population health metrics. This targeted approach helps our clients to quickly use their data for interventions; furthermore, we identify additional data sources that can provide insight into refining patient engagement strategies. Our focus is to make your mountain of information accessible and understandable to health experts and decision-makers so it can be translated into action. In today's rapidly-evolving healthcare marketplace, payer incentives and penalties are a reality – the time to act is now!

Contact us to learn more about how we can collaborate with your organization to improve patient engagement, activation, and outcomes.

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