5 STEPS TO SUCCESSFUL ELECTRONIC MEDICATION MANAGEMENT IMPLEMENTATIONS

An InterSystems White Paper for Healthcare IT Executives
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Electronic medication management systems (eMM) evidentially\(^1\) offer significant benefits, including reduced medical errors, better compliance, time savings, cost savings, and better drug safety.

However, despite early gain, adopters continue to describe a number of limitations and risks associated with eMM. These range from selecting the wrong drug from electronic pick lists, irrelevant alerts that reduce productivity, and lack of support for complex prescribing scenarios, to sporadic adoption due to lack of integration or usability and accessibility issues.

The adoption of eMM systems does, however, continue to gather pace. Few, if any, organizations have pulled the plug on implemented solutions by reverting to a paper-based system. The benefits of eMM outweigh the negatives. For example, while the reduction of medication errors remains difficult to measure — largely because institutions typically don’t have reliable statistics from pre-implementation — eMM provides the capability to measure errors reliably going forward and provides better opportunity to initiate change to reduce the risk. More importantly, these systems can identify potential errors before they are made by invoking decision support and providing standards-based approaches to prescribing. eMM systems need to respond to potential sources of error by improving usability, by delivering robust decision support, by supporting all prescribing scenarios so clinicians don’t need to work between paper and electronic systems, and by providing fully integrated solutions so data does not get lost or misinterpreted between separate systems.

To gain maximum benefit from eMM systems and avoid the pitfalls that are still possible, we have summarized lessons learned by early adopters.

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SET CLEAR OBJECTIVES

Nearly all of our clients are implementing or have plans to implement eMM capabilities, if they have not already done so. Among early adopters of InterSystems TrakCare unified healthcare information system, hospitals have reported reduced adverse allergy and drug interaction incidents, as well as savings through better inventory control. But medication management is a complex area involving many functional areas within a healthcare organization. Having a functioning electronic system in itself — even a state-of-the-art one — does not guarantee best practice, or that all the expected benefits will be achieved.

It is a good idea to agree on and prioritize realization of a limited set of objectives from the very beginning, and take steps to measure the before and after situation so that, at the end of the day, benefits can be clearly demonstrated or unexpected issues identified. This delivers early value, provides a solid platform for achieving additional objectives and benefits over time, and builds trust. Implementations that promise ‘everything for everyone all at once’ without clear and measurable objectives can often become bogged down in unresolved issues, eroding trust and undermining adoption.

Initial objectives and priorities will vary between organizations. In some healthcare jurisdictions there are incentive payments for electronic prescribing and initially the objective may simply be accurate reporting to secure such payments. Many hospitals want better ways to include a patient’s current or planned medications in discharge summaries, daily notes, or other documentation. Others are looking for ways to ensure that regular medication chart reviews are completed or that prescriptions for some specific drugs are controlled, safe, traceable, and comply with regulations. Others again may want to implement order sets or protocols for certain patient conditions that can drive both clinical care and procedures and policies around dispensing. The prevention of medication stock losses through theft and patient safety at medication administration time are target areas, as is the drive to standardize medicine usage across all facilities and locations within the healthcare organization. Having clear objectives for eMM does not preclude an enterprise-wide roll out from the start (big bang approach) or a staged roll out over a longer period of time, but it does set the priority for its use and management.

Healthcare information systems with embedded analytics make it easier to automate the measurement of benefits and report against KPIs. That way, users of the system can see their own roles as part of the overall effort of delivering improvements in medication management, rather than working within isolated units.

PLAN FOR ADOPTION: involve stakeholders and communicate well

Efficient and safe medication management requires the involvement of all clinicians with rights and responsibilities for prescribing, administration,
dispensing, clinical efficacy, and optimal use of medicines, both clinically and from an administrative or stock control perspective. Because eMM has such a wide impact, it is imperative that all stakeholders be engaged early.

Most organizations already use a number of specialized systems that have a role in medication management and some of these have loyal clinical users that are reluctant to change. Standalone pharmacy systems are widely deployed, and ePrescribing and nursing systems also exist in various forms. These systems may work well for individual users for a limited set of functions, but typically they are not connected and users of one system usually do not understand how the full life cycle of medication management works or how what they do impacts others.

eMM success requires good workflow where each part of the medication life cycle is well connected (a closed loop) and all participants involved are working well together. The failure by any user group to adopt a newly implemented eMM solution will drastically impact the ability to achieve expected benefits. However, since staff can only cope with so much change at once, adoption plans need to be well supported and ongoing with acknowledgement that systems and requirements usually continue to change over time.

Organizational investment in training is a key component in driving user adoption. The system may be easy to use, but clinicians are busy and usually respond best to taskbased and incremental learning opportunities.

While users will initially focus on their own environment, they will also become open over time to valuing the benefits achieved by upstream and downstream users. Organizations can accelerate this process by measuring the benefits achieved and regularly communicating them with stakeholders.

CLOSE THE LOOP

Medication errors are one of the biggest sources of preventable errors for most healthcare organizations. Electronic medication management systems can reduce errors associated with illegible handwriting, ambiguous nomenclature, uncertainty about drug dosing, and interactions between drugs.

But systems that are not tightly integrated hold less promise for reducing medication errors. An ePrescribing system may give a care provider access to a drug database and decision support system, but not connect with a pharmacy system. So the prescription may need to be printed, taken to the pharmacy, and re-entered when it gets there, duplicating data entry and introducing the risk of transcription errors.

Even if the ePrescribing and pharmacy systems are connected through interfacing, they may not use the same information sources. The prescribed drug may have different names, or be listed by brand rather than generic description, multiplying the risk of selection errors. In addition, the pharmacy
may not have access to the same electronic patient record. While the prescribing doctor knows all about the patient, the same clinical information may not be visible or available to the pharmacist. Both systems may generate contraindication alerts, but in one system the reason for overriding the alert may be visible, and in the other it may not. This may necessitate a phone call from the pharmacist to the prescribing doctor, wasting time. And the whole scenario may be repeated again when it is time for the nurses to administer the drug to the patient.

In an ideal world there would be just one unified healthcare information system managing all aspects of patient care, with data residing in a single repository. But for many valid reasons, this is often not feasible. For example, a single system can’t always meet all of an organization’s requirements and in many organizations it may be impractical to replace systems that have been heavily invested in, both financially and in terms of user acceptance.

When this is the case, organizations need to ensure that a new eMM system can be easily integrated with existing systems to avoid the pitfalls outlined above. It is possible to reap the benefits of a closed loop system when the integration is designed with care and built into the eMM system, not bolted on. But, in our experience this is most easily achieved when the new eMM system is based on a strategic interoperability platform such as InterSystems HealthShare and when the implementation team has a proven track record in the delivery of complex integrations.

A fully closed loop eMM environment can really only be achieved when system limitations do not force users to revert to paper for specific scenarios. This means, for example, that prescribing, dispensing, and administration for any type of medicine must be supportable in the system. Even if there are limitations it must be possible to record all the necessary information in the electronic system. Can the system support complex scenarios such as admixture prescribing and continuous IV administration? Can IV volumes be easily included in fluid balance charts? Does the system provide the flexibility needed to allow clinicians to specify their intention without needing to worry about brands, pack sizes, or stock availability? And can the pharmacist easily review medication charts, suggest changes, and receive help for resolving dose-based orders?

**FOCUS ON SAFETY AND USABILITY**

Making the system easy to use and safe for all groups involved in medication management is a major focus for systems developers. Different users have different functional requirements, and the system should allow them to navigate across different areas without losing track of the task at hand. Information in an eMM system should be expressed in a way that is appropriate to each person’s role, even though the underlying data is identical. The provision of decision support and management of subsequent alerts is likely the number one area where both safety and usability intersect. Distracting and unnecessary alerts lead to complaints from clinicians that they
are constantly being barraged with more alerts than they need to do their jobs. However, alerts are provided to avoid errors. Systems need to have the capacity to filter alerts beyond a user's specific role to also take into account their level of experience or seniority. A unified view of alerts and a manageable way to action them, including the need to record an override reason that can be constrained by the severity of the risk, are very helpful and provide ease of use while maintaining safety. All the information provided by the prescriber should also be available to the dispensing and clinical pharmacists and administering nurses so they are fully informed and assured that any changes to the patient condition between prescription and administration time are taken into account.

Ensuring that prescriptions include all the information needed for good practice, without burdening providers by requiring them to specify detail that nurses or pharmacists would usually provide, is another area where safety and usability intersect. For example, the use of default recipes for admixtures — while also providing flexibility for ad-hoc compounding or the ability to order admixture infusions without specifying the exact diluent — supports prescribing practice that is standards-based, fast, and flexible. Ensuring that such complex prescriptions are easily identified throughout the system, and display as a single order item in pharmacy dispensing lists and medication charts, makes the order easier to interpret and thereby avoids error.

Another example is system-wide support for prescribing at different levels of specificity that enables the implementation of policies for safe and standards-based use of certain drugs while also providing options for inventory control and the flexibility to address the preferences of individual users where appropriate. For example, the user may select the required medication using only strength and form while in other scenarios brand and pack size must also be indicated.

Allowing modifications to be made to an order that has already commenced without needing to discontinue and re-order saves a significant amount of time for the care provider and also makes it easier to identify and track changes to therapy over time. This is both a usability and a safety issue. Clinician-focused information about the life cycle of the order and its administration record should be provided.

The ability to implement a regular contextual review policy for active patient orders based on, for example, the type of medicine ordered or the department or specialty under which the patient is admitted, is also useful. This can support initiatives such as antibiotic stewardship and ensure that decisions about ongoing treatment (discontinue, continue, modify, or add new orders) can be implemented and tracked within a user friendly workflow.

Systems developers, implementers, and healthcare organizations all have a part to play in incorporating the feedback of early adopters of eMMs. If they get it right, their success will pave the way for further advances in healthcare information systems involving clinical users.
**MAINTAIN GOOD PRACTICE and continuous improvement**

Modern healthcare information systems contain an everexpanding array of sophisticated clinical functionality designed to make life easier for care givers. So it is understandable that users expect to be able to rely upon the support of electronic medication management systems.

The problem is that systems are not a replacement for clinical knowledge or clinician engagement with patients. Implementing a good system does not excuse organizations from doing the hard work of determining exactly how that system should maintain and improve upon existing good practice.

Systems should come with a set of preconfigured workflows and rules that allow sites to get up and running quickly, but can be modified if required. This may include determining the minimum information to be collected, configuring the types of alerts that different users will receive, managing the formulary configuration of quick pick order sets and order favorites, and enabling appropriate security for users.

Often organizations need to implement more complex rules to, for example, reflect the clinical pathway for a certain condition, such as diabetes. In addition to decision support systems based on standard drug databases, this may rely on data held in the patient record about age, weight, and test results. Building these rules is simplest in a unified environment based on common data sources but can also be implemented via a health informatics platform that enables strategic interoperability and analytics.

**The Future**

Customers on 4 continents have achieved breakthroughs in Medication Management with TrakCare through regional cross-care setting deployments, and in hospitals as large as 850 beds and as small as 75 beds. We are continually working with customers from around the world to bring global insights and best practices into TrakCare’s medication management capabilities.

Clinical users have entered the era of information overload. Access to copious quantities of clinical information can in itself create the capacity for increased stress and error. One of the challenges for systems developers is to effectively filter information to include only what clinical users need to work efficiently and safely.

Our medication management team includes clinicians, nurses and pharmacists with a deep understanding of the domain. They work closely with our development team to ensure that we offer the safest, most effective approach to medication management that empowers care providers. Medication Management implementations are transformational and therefore require a strong focus on change management. InterSystems’ ARIES implementation methodology, which stands for Architecture for Rapid Implementation of
Enterprise Systems, is designed to lower implementation risk and get key stakeholders involved from an early stage.

Electronic Medication Management is delivering significant benefits to our customers, and we welcome the opportunity to help you achieve your goals.