

WHITE PAPER

CLINICAL XPERT™ MEDICATION RECONCILIATION



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CLINICAL XPERT MEDICATION RECONCILIATION

Growing safety concerns are among the most urgent pressures faced by healthcare providers and regulatory agencies in today's complex healthcare environment. Many new reporting requirements—and the resulting administrative practices and vendor solutions—focus on safety issues. In particular, rising figures on adverse drug events (ADEs) have alerted the industry to the fact that providers must exert greater control over the medication prescribing process. With the quantity and diversity of medications available these days—along with the growing decentralization of treatment and lack of effective tracking mechanisms—providers have found it extremely difficult to ensure that patients are consistently using a safe combination of drugs, in safe amounts. Medication reconciliation provides an effective response to this growing problem.

According to the Joint Commission (formerly JCAHO), "Medication reconciliation is the process of comparing a patient's medication orders to all of the medications that the patient has been taking. This reconciliation is done to avoid medication errors such as omissions, duplications, dosing errors, or drug interactions. It should be done at every transition of care in which new medications are ordered or existing orders are rewritten. Transitions in care include changes in setting, service, practitioner, or level of care."

Although the majority of healthcare providers have at least initiated medication reconciliation procedures, most are still using paper-based methodologies that are costly and time-consuming. They are also highly prone to errors that, in the case of resulting ADEs, can be fatal. Unfortunately, the few electronic solutions that are being marketed today as medication reconciliation platforms don't provide the full range of functionality required, and often lack key ease-of-use features that complicate adoption and contribute to a continued high cost of maintenance. With the Clinical Xpert Medication Reconciliation solution, however, users gain a simplified electronic environment that has been built from the ground up to deliver the specific workflow and ease-of-use capabilities needed for an accurate, cost-efficient medication reconciliation solution.

MEDICATION ISSUES AND TRENDS

RIISING NUMBER OF ADVERSE DRUG EVENTS

One of the most pressing issues among healthcare providers today is the growing incidence of adverse drug events (ADEs). The National Coordinating Council on Medication Error Reporting and Prevention defines an adverse drug event as “any preventable event that may cause or lead to inappropriate use or patient harm, while the medication is in the control of the healthcare professional, patient, or consumer.” The ADE problem has become so severe that the Institute of Medicine of the National Academies has estimated that 1.5 million preventable ADEs occur each year in the United States.^(PME) Definitive fatality figures are lacking, but studies indicate that a statistically significant proportion of hospital deaths can be attributed to ADEs.

In addition, the costs of coping with ADEs—e.g., extended stays, additional treatment, and lawsuits—have soared to unacceptable heights. The Agency for Healthcare Research and Quality states that additional hospital costs related to ADEs can be estimated at up to \$5.6 billion per year. The agency also cites studies indicating that hospitals incur an extra 8–12 days length of stay (LOS) and up to \$24,000 for each patient experiencing an ADE.^(RPADE)

INADEQUATE MEDICATION RECONCILIATION

Studies show that a high proportion of ADEs are attributable to inefficient or nonexistent medication reconciliation. According to the Institute for Safe Medication Practices (ISMP), lack of effective medication reconciliation is responsible for over 50 percent of all medication errors, and up to 20 percent of all ADEs. The ISMP also identifies the types of medication errors that can be reduced or eliminated through an effective medication reconciliation process:

- Discontinued medications that are continued in error in the hospital and upon discharge
- Omitting a medication
- Failure to restart a medication that has been placed on hold
- Failure to discontinue contraindicated home medications
- Failure to resolve discrepancies in dosages or route

The Joint Commission echoes these findings: “The Joint Commission’s sentinel event database includes more than 350 medication errors resulting in death or major injury. Of those, 63 percent related, at least in part, to breakdowns in communication, and approximately half of those would have been avoided through effective medication reconciliation.”^(JC)

Other areas of industry research support this outlook. For example, a well-researched *Extended Care Product News* article states: “By far, the most pervasive cause of ADEs is medication-to-medication interactions. These interactions are often triggered by the decrease or increase of the presence of a medication in the blood where other medications are already present.”^(MMS) Effective medication reconciliation helps providers avoid such interaction oversights.

JOINT COMMISSION MANDATES

As a further boost to voluntary adoption of medication reconciliation procedures throughout the country, the Joint Commission has issued a number of mandates (Goal 8–8A/8B) that place the burden on healthcare providers to implement effective patient safety measures with regard to medications. Specifically, these mandates require healthcare providers to:

- **Goal 8A:** Implement a process for obtaining and documenting a complete list of the patient’s current medications upon the patient’s admission to the organization and with the involvement of the patient. This process includes a comparison of the medications the organization provides to those on the list.
- **Goal 8B:** A complete list of the patient’s medications is communicated to the next provider of service when a patient is referred or transferred to another setting, service, practitioner, or level of care within or outside the organization. The complete list of medications is also provided to the patient on discharge from the facility.

The Joint Commission specifies that these rules be applied “. . . across the continuum of care. This means medication reconciliation applies to all care settings—including ambulatory, emergency and urgent care, long-term care, and home care—as well as inpatient services.”^(UC)

Also, the Joint Commission’s definition of medication is very comprehensive: A medication includes “any prescription medications; sample medications; herbal remedies; vitamins; nutraceuticals; over-the-counter drugs; vaccines; diagnostic and contrast agents used on or administered to persons to diagnose, treat, or prevent disease or other abnormal conditions; radioactive medications; respiratory therapy treatments; parenteral nutrition; blood derivatives; intravenous solutions (plain, with electrolytes and/or drugs); and any product designated by the Food and Drug Administration (FDA) as a drug.”^(UC FAQ)

The Joint Commission also specifies what the medication reconciliation process consists of: “. . . 1) develop a list of current medications; 2) develop a list of medications to be prescribed; 3) compare the medications on the two lists; 4) make clinical decisions based on the comparison; and 5) communicate the new list to appropriate caregivers and to the patient.”^(UC) From a provider’s workflow perspective, this breaks down into three clear tasks:

- Identify a patient’s list of medications taken prior to arrival at the hospital
- Review and compare this list to medication orders throughout points of care (admission, transfer, discharge)
- Communicate the list to the patient and to caregivers throughout the healthcare system

CURRENT APPROACHES TO MEDICATION RECONCILIATION

The majority of healthcare providers have adopted paper-based medication reconciliation methodologies in an effort to achieve compliance with Joint Commission requirements in the fastest, simplest way possible. However, these manual methods have turned out to be highly inaccurate, costly, and time-consuming. Disadvantages include:

- Reliance on patient memory to create initial medication list
- Multiple copies are hard to track and quickly become out of date
- Illegible handwriting/not enough room to write
- No way to avoid prohibited abbreviations
- No interaction, allergy, and duplication checking
- Physician complaints that the process takes too long
- Pharmacist complaints that prescription data is incomplete

Studies show that the most effective way to lower the risk of ADEs and reduce associated costs is to implement computerized systems. The Agency for Healthcare Research and Quality offers a range of statistics supporting this view:

“Anywhere from 28 percent to 95 percent of ADEs can be prevented by reducing medication errors through computerized monitoring systems.”

“Hospitals can save as much as \$500,000 annually in direct costs by using computerized systems.”

“Computerized medication order entry has the potential to prevent an estimated 84 percent of dose, frequency, and route errors.”^(RPADE)

As support for this approach, a number of industry vendors have begun to market electronic medication reconciliation solutions. The drawback to most of these packages, however, is that they are incomplete, and tend to emphasize only one aspect of the medication reconciliation process. For example, electronic prescribing applications help avoid pharmacy errors but fail to address other medication reconciliation issues. Standalone reference databases enable quick lookup of medication information but fail to provide workflow or reconciliation capabilities. Also, workflow applications improve speed and accuracy but lack easy links to existing patient medication information and are often resisted by the physician community as being too much of a divergence from familiar workflow and documentation processes.

THE MEDICATION RECONCILIATION CHALLENGE

COMPONENTS OF AN IDEAL MEDICATION RECONCILIATION SOLUTION

To be complete, a medication reconciliation solution should be able to deliver the full range of functionality required, in an integrated package that is easy to use and accurately reflects a real-world workflow. Specifically, it should offer the following.

- **Easy data access**
Simple access to current, accurate, complete patient medication data at any point during a patient's hospital visit, including:
 - a) Past medication history
 - b) Current home medication list
 - c) Any medications that have been administered during the current visit
 - d) Modifications made to the home medication list during the current visit
- **Medication ID**
Ability to quickly identify home medications when patients are unable to correctly identify the medications themselves
- **Easy-to-use interface**
Simple ways for healthcare providers to quickly update patient medication history throughout a patient's hospital stay
- **Checks and alerts**
Quick duplication checks and adverse reaction alerts, including drug-to-drug interactions and patient drug-allergy notification
- **Printouts**
Ability to quickly print an up-to-date medication list and instructions for each patient upon discharge
- **Printed prescriptions and e-prescribing**
Printed prescriptions for the patient or electronic prescription transmittal directly to pharmacies
- **Administrative ease-of-use**
Efficient, ongoing management capabilities

TECHNICAL REQUIREMENTS

An effective medication reconciliation solution also depends on certain technical capabilities, namely:

- Centralized, integrated application platform
- Automated interface between the medication reconciliation application and existing hospital information system (HIS)
- Automated and/or simplified links with external, recognized healthcare information sources
- Electronic prescribing capabilities
- Simple, intuitive graphical user interface that can be quickly learned by hospital staff
- Online workflow features that match up with typical, real-world hospital activities
- Built-in security features that meet HIPAA requirements
- Easy administration and maintenance, including simplified reporting
- Proven underlying technologies
- Reliable technical support

CLINICAL XPERT MEDICATION RECONCILIATION

Clinical Xpert Medication Reconciliation from the Healthcare business of Thomson Reuters is the first electronic system designed from start to finish to provide the ease-of-use features and end-to-end functionality required for a total medication reconciliation solution. By matching product design to workflow needs, the solution ensures speed and accuracy, minimizes administrative costs, lowers risk and liability, and provides a comfortable user interface that makes it easy to meet compliance requirements.

BROAD, INTEGRATED FEATURE SET

Proven technology platform

Clinical Xpert Medication Reconciliation is built on the Clinical Xpert platform (formerly MercuryMD). Clinical Xpert is an award-winning, well-tested platform that integrates data from existing information systems and securely delivers patient information directly to the desktop. The underlying technology has remained the KLAS award leader in its category for seven consecutive years, providing clear evidence of reliability, durability, and high performance.

HIS integration

HL7 data feeds from any compliant HIS system provide instant information on medications ordered during previous hospital visits. Patient allergy data from the HIS system is used to trigger onscreen alerts—for instant drug-allergy (as well as drug-drug) interaction checking. By accessing past discharge medication orders, hospitals can reduce errors in creating the patient home medications list due to incorrect patient recall or secondhand information from friends or family. The versatility of the Clinical Xpert platform allows users to develop custom outbound integration solutions for most HIS systems, further enhancing efficiency and staff productivity.

Automatic data feeds from external sources

Through a tight partnership with DrFirst®, the solution seamlessly and transparently integrates patient-specific prescription data from retail pharmacies and insurance plans into a patient's medication history. By incorporating information from DrFirst partners including SureScripts® and RxHub®, the solution ensures that the patient's home medication list will be as complete as possible.

Simplified drug identification

Transparent links with referential data in Micromedex® Healthcare Solutions from the Healthcare business of Thomson Reuters permit an admitting nurse or other intake staff to quickly and accurately identify loose medications based on physical description, imprints and photos. This further increases the accuracy of the home medication list and facilitates the intake process.

Drug-interaction checking

Interaction monitoring, also handled through Micromedex Healthcare Solutions, provides immediate onscreen alerts in case of conflicts, ensuring patient safety and enhancing the accuracy of the medication reconciliation process throughout a patient's hospital visit.

Comprehensive drug lookup information

One-click InfoButton Access® provides topic-specific linking into Micromedex Healthcare Solutions drug reference information, allowing staff to quickly view extensive dosage, contraindications, and other drug information without having to launch another application.

Automatic drug-allergy notifications

Automatic alerts, based on information received from the HIS, enhance patient safety and the accuracy of the medication reconciliation process during a patient's entire hospital stay.

Built-in drug-duplication checks

The system automatically checks for drug duplication (due to accidental or therapeutic error) and immediately alerts care providers accordingly. This capability further guarantees patient safety, reduces errors, and helps streamline the medication reconciliation process.

Integrated electronic prescribing

Care providers can choose to transmit prescriptions electronically to pharmacies, eliminating errors due to illegibility and avoiding unnecessary delays in getting medications to patients in a timely manner.

Customizable reports

A variety of detailed reports—based on Business Objects™ Crystal Reports®—are available for tracking, analysis, and regulatory reporting purposes. Flexible features include the ability to incorporate a hospital logo, URL, contact information, or other information into the documents. Built-in reporting capabilities simplify administration and reduce the costs and time involved in meeting reporting requirements.

Easy-to-use Web-based interface

Clinical Xpert Medication Reconciliation provides easy data entry and retrieval without extra steps or time (and without annoying pop-ups). Intuitive prompts and data entry fields, plus common-sense menus and features, reflect the typical workflow process.

REAL-WORLD WORKFLOW

Build and reconcile the home medication list

When a patient first arrives at the hospital, admitting staff are required to assemble complete, accurate data on the medications that the patient is currently taking. This is a time-consuming procedure and seriously impacts the rest of the patient visit (and post-visit experience upon discharge). From the medication reconciliation perspective, this has traditionally been the most difficult step in the process, since current manual and/or verbal methods for data gathering are highly error-prone and can lead to incomplete results that undermine patient safety.

Building the list—Clinical Xpert Medication Reconciliation facilitates the building of a home medication list in a number of key ways:

- Automatically displays detailed patient medication history
- Allows staff to add medication information manually whenever necessary (for example, for custom compounds or over-the-counter medications)
- Permits quick drug identification
- Runs drug checking in the background, providing inline notification of potential adverse drug interactions or patient allergies

Reconciling—Once the home medication list has been created, the nurse or other authorized care provider can simply click on a “Reconcile” button to view or modify the list and establish which medications the patient should be given while in the hospital. Options allow providers to continue, stop, modify, or add medications. The simple point-and-click interface makes it easy to view, select, and modify prescriptions—including dosage and frequency—so that the entire reconciliation process becomes very quick, intuitive, and flexible. The resulting list of medications becomes the inpatient or active medication list.

Saving and sign-off—When an authorized care provider revises the home medication list to create what will become the inpatient medication list, changes can be saved temporarily so that other physicians can participate in reconciliation at this initial stage. For example, a primary care provider will likely be reluctant to make decisions about medications related to a heart condition that is being treated by a specialist. This collaborative approach makes it much easier to share information about a patient in a way that ensures safety and maximizes the quality of care. The names of participants in this process are always displayed, so that the full history of changes is obvious. Once it is clear that everyone who needs to be involved has made their changes, an authorized user enters a secure PIN to sign off on the entire list.

Maintain and reconcile the active medication list

As a patient moves from one point of care to another within the hospital, the active medication list must be repeatedly verified and reconciled—at every transfer point. With Clinical Xpert, the procedure follows the same steps as the initial reconciliation, allowing physicians or other authorized users to view, modify, and confirm the medication list whenever necessary.

Reconcile and print the discharge medication list

When the patient is ready to leave the hospital, staff must be able to generate an accurate discharge medication list for the patient and for any referred outside provider. Prescriptions must either be printed for the patient or transmitted directly to the patient's pharmacy. Clinical Xpert Medication Reconciliation simplifies the discharge process in a number of ways:

- Permits a final, well-documented reconciliation, allowing physicians or other care providers to indicate in the patient history which medications the patient should continue from their previous home medication list, and which medications should be discontinued, modified, or added
- Provides the patient with a complete medication list, along with comprehensive, clear instructions
- Offers patients a convenient medication card
- Prints out prescriptions and can send prescriptions electronically to pharmacies
- Allows the hospital to notify outside providers of medication changes (via e-mail), if the providers are Clinical Xpert users and have been previously identified in the HIS

Mapping Home Medications to Inpatient Medications

Recognizing that a patient's first reconciliation may occur following the placement of initial inpatient medication orders, users are able to quickly "map" home medications to new inpatient medications. This process allows the user to quickly move new inpatient medication orders just placed to the "continue" column in the reconciliation process, while permitting them to match home medications to the inpatient equivalent. The result is a clear indicator—represented graphically by a home or hospital icon—of the original source of the medication.

COMPLIANT SECURITY

Clinical Xpert Medication Reconciliation is a HIPAA-compliant solution that meets and exceeds measures outlined in HIPAA guidelines. Its technical safeguards help providers meet requirements as specified in Section 164.312 of the HIPAA Final Security Rule, which relates specifically to user authentication, access control, audit controls, encryption, integrity, and transmission security.

IMPLEMENTATION AND TECHNICAL SUPPORT

The experienced client services team from Thomson Reuters help set up the medication reconciliation solution to suit users' particular technical and business requirements. The low-maintenance, Web-based system centers around two Microsoft® Windows® 2003 servers. One acts as a Web server, hosting the Clinical Xpert Medication Reconciliation software. The other hosts an Oracle® database and any software necessary for an HIS interface. Background links to most referential data operate over a hospital LAN, with secure outside pathways created to enable Internet exchanges with services such as DrFirst. If a Micromedex Solution is already on site, a LAN connection is established. If not, the system is set up to permit a Web connection with Micromedex data at a remote Thomson Reuters facility.

A full range of clients services and technical support options are available to ensure that system implementation goes smoothly and that ongoing operations consistently meet expectations for performance, ease of use, and reliability.

BENEFITS

As one of the most complete electronic medication reconciliation solutions available today, Clinical Xpert Medication Reconciliation can help reduce the high costs associated with ADEs and significantly enhance patient safety. By improving communication among hospital staff, it can also improve efficiency and productivity. In addition, the solution provides an effective method for complying with Joint Commission mandates, providing easily captured documentation of the medication reconciliation workflow, along with reporting mechanisms that match up with Joint Commission requirements.

SUMMARY

Medication reconciliation is one of the most demanding requirements in today's hospital environment, and few electronic solutions have delivered the range of functionality needed to handle this sophisticated process. At present, our Clinical Xpert Medication Reconciliation is the only end-to-end electronic solution available for meeting these challenges, providing a range of targeted capabilities along with exceptional ease-of-use features that simplify adoption and implementation. The solution:

- Significantly reduces the potential for adverse drug events due to incomplete or incorrect medication lists
- Eliminates the need to manually reconcile patient medications, saving both time and effort
- Satisfies Joint Commission medication reconciliation requirements
- Streamlines communication between clinicians at all stages of care, including transitions and outpatient settings
- Generates an accurate discharge medication list, prescriptions, and clear instructions

With so much at stake—including patient safety, hospital liability, community accountability, and overall profitability—Clinical Xpert Medication Reconciliation provides a dependable option for ensuring the continued accuracy and effectiveness of all medication-related procedures in an acute-care setting.

REFERENCES

- ISMP Institute for Safe Medication Practices (ISMP), January 2007
- JC Joint Commission, February 2006; http://www.jointcommission.org/SentinelEvents/SentinelEventAlert/sea_35.htm
- JC FAQ FAQs for The Joint Commission's 2007 National Patient Safety Goals, Goal 8; <http://www.jointcommission.org/PatientSafety/NationalPatientSafetyGoals/>
- MMS *Medication Management Strategies to Maximize Patient Safety*, Sarah Browning, RNC, MSN, and Billie H. Waldo, RN, MSN, BC (ECPM, Volume 98, Issue 2, March 2005); <http://www.extendedcarenews.com/article/3851>
- NCC National Coordinating Council on Medication Error Reporting and Prevention
- PME *Preventing Medication Errors*, Committee on Identifying and Preventing Medication Errors, Board on Health Care Services (Institute of Medicine of the National Academies, 2007)
- RPADE *Reducing and Preventing Adverse Drug Events To Decrease Hospital Costs* (Research in Action, Issue 1, March 2001; Agency for Healthcare Research and Quality); <http://www.ahrq.gov/qual/aderia/aderia.htm>
- USHHS U.S. Department of Health and Human Services and Centers for Medicare and Medicaid Services

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