Faster, more accurate medication reconciliation in the ED

How health information exchange technology is helping Inova Alexandria Hospital access nationwide prescription data in seconds

NoVaRHIO Catchment area
Washington, D.C. Metro Area–Planning District 8

State of Virginia

GE Healthcare
Introduction

More than 136 million people visit emergency departments (EDs) each year in the U.S.\(^1\) Approximately 40 million — one in three\(^2\) — are unable to give ED personnel accurate information on their current prescription medications. Not having this data can impact the accuracy and speed of treatment, as well as increase the risk of medication interactions and errors.

An innovative medication history system being piloted in the ED at Inova Alexandria Hospital in Alexandria, Va. is promising to change that. The system, known as MEDS-ED, enables ED personnel to electronically access a history of the patient’s medications no matter where in the U.S. those prescriptions were written. The medication lists flow directly from available data sources across the country into the electronic health record in the ED so that clinicians can access the information right at the bedside.

MEDS-ED is the first project of the Northern Virginia Regional Health Information Organization (NoVaRHIO), a consortium of healthcare, business, education, and government organizations focused on improving the availability of accurate and timely electronic medical records for the citizens of northern Virginia. Supporting partners on this project include Inova Health System, GE Healthcare, Picis, Audacious Inquiry, George Mason University, and the Commonwealth of Virginia.

“MEDS-ED is designed to reduce the inaccuracies in patient medication histories while improving the ease of acquiring this information,” says Philip Reilly, NoVaRHIO chairman. “We chose it as our first project since health information is so critical in emergencies and often very difficult to access.”
A Conduit For Accessing Medication Data

The backbone of the MEDS-ED system is a Health Information Exchange (HIE) platform designed by GE Healthcare’s global eHealth Solutions business. This secure connectivity infrastructure serves as the conduit for accessing medication data, sending the patient query from the ED to the national prescription data medication history service and then making the found data available to the electronic health record, the Picis™ ED PulseCheck. Within seconds from the time the initial query is made, the medication results are presented within the clinician’s normal data workflow.

“The system brings into the patient record a much more accurate and detailed list of medications than we’ve ever had before. Even though it’s a pilot and still being optimized, even the most severe critic would say that MEDS-ED gives us better information,” says Martin Brown, MD, FACEP, chairman of the Department of Emergency Medicine at Inova Alexandria Hospital.

The data collection process follows these basic steps:

- **Registration:** When registering in the ED, the patient is given information about the pilot and asked for consent to access his or her medication history electronically. An active patient opt-in approach was chosen to align with the patient participation model of the Commonwealth of Virginia HIE (COV-HIE), to help ensure privacy while engaging and educating patients.
- **Query:** If the patient has consented, the registrar checks a flag in the patient’s electronic chart, an action that sends an HL7 demographics feed to the HIE and triggers the search.
- **Search:** The HIE sends a query to the primary medication history service (Surescripts), which connects to pharmacies and pharmacy benefit managers across the country.
- **Retrieval:** If a match is found, the retrieved medication history is sent back through the HIE and into the EHR as the patient is moved from triage to the clinical setting.
- **Integration:** The clinician clicks the flag icon and the medications appear on the patient’s electronic chart, outlined in red, next to medications already listed in the chart. The newly retrieved meds have “unverified status” until the clinician talks with the patient and either adds them to the chart or deletes them.
Results to Date

The project launched in April 2011 and in the first four months, the following results were measured by Inova in a study conducted during the launch phase:

• **High patient acceptance:** About 90% of ED patients consented to having their medication histories accessed electronically. Of those, about half had retrievable medication data

• **Higher accuracy:** For those patients with retrievable medication data, the MEDS-ED system has helped improve the accuracy of patient medication as reported by ED providers. The system is seen as having particular value for patients who are incapacitated, elderly, or have a language barrier

• **Helping clinicians enhance patient safety:** “Medication reconciliation is recognized as a key component in ensuring patient safety,” says Dr. Brown. “The system helps ensure that in the first minutes and hours of care, we don’t prescribe medications that would react negatively”

• **50% faster reconciliation:** Having data from the MEDS-ED system has helped cut patient medication interview time by half — from 20 to 10 minutes, approximately

• **Clinician satisfaction:** “The MEDS-ED system enables faster, more focused assessment of the patient and, in some cases, faster treatment. Physician feedback has been very positive,” says Dr. Brown

• **Workflow efficiency:** “The system helps prevent medication transcription/entry errors and workflow interruptions for nurses and physicians,” says Dr. Brown. He adds that physicians appreciate having the data available directly in the EHR, with no need to log on to another system to see the information

By the end of 2011, more than 15,000 patients will have benefitted from the MEDS-ED system at Inova Alexandria Hospital, according to Dr. Brown.

“Medication problems extract a high personal toll, as well as significant financial cost. Half of Medicare beneficiaries are being managed for chronic diseases. That means millions of people have medication information that needs to be available immediately to get the right care,” says Mark Crockett, MD, FACEP, president of the Emergency Care Division at Picis. “Inova, GE Healthcare, and Picis have worked together to do the right thing in Virginia, and I hope to see this type of project be successful across the country.”

Semantic Interoperability

Achieving multi-system interoperability using data from disparate sources for workflow integration into an EHR has been difficult to achieve until now. The standards-based HIE platform from GE Healthcare enables this semantic interoperability by “speaking all the languages,” that is, complying with all IHE (Integrating the Healthcare Enterprise) and HITSP standards and profiles. Throughout the process, GE Healthcare’s eHealth Information Exchange is translating the data into multiple formats behind the scenes to create what appears to ED clinicians as a seamless flow of information. For example:

• The Surescripts medication history service provides information in RDS format with each drug identified by its National Drug Code (NDC), a unique numeric identifier assigned by the FDA. The NDC code, however, is not a Meaningful Use standard nor does it easily integrate into EHR systems

• eHealth Information Exchange translates the NDC codes into an RxNorm code and reformats the data into an HL7 Continuity of Care Document (CCD), a format that supports alignment with MU standards

• The Picis EHR system then queries the HIE using an IHE profile called XDS, pulls the CCD, and maps the medication data into local terminology so it can appear in the patient’s chart

“It is a highly complex series of events and it all happens in a matter of seconds,” explains Bill Howard, director of the eHealth Solutions Architecture for GE Healthcare. “You need to pay attention to this level of technical detail in order to ensure that the medication information can flow directly into the provider’s workflow.”
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More Accurate Data in Half the Time
Inova Alexandria Hospital has been focused on optimizing medication management for some time, according to Pharmacy Director Michelle Le, Pharm. D. The hospital is one of the few in the region with a full-time medication reconciliation technician in the ED. This technician, Mark Levitz, RPhT, interviews approximately 25 patients a day during his noon to 8:30 shift, typically the busiest hours in an ED. That adds up to about 5,000 interviews a year. In his estimation, “no more than 10 to 20 percent” of patients in the ED can provide an accurate medication history. Having medication results from the MEDS-ED system, he says, “helps trigger patient cooperation and memory,” providing a valuable starting point for patient conversations.

“I can walk in the room and say: ‘I have a list of your prescriptions. Let’s go over them one by one and you can tell me what you are taking and what you aren’t’ as opposed to starting with a blank slate,” says Levitz. This helps cut interview time in half—“from 20 to 10 minutes,” he says.

Accuracy has increased significantly, says Le. “With MEDS-ED, we have a list of medications at the click of a button. We still need to do a thorough interview with the patient but our accuracy rate has improved,” she says.

Patients are impressed with the system too, says Levitz. “I’ve had patients say things like, ‘That’s great! I’m 80 years old–I don’t remember what I take.’ I say: ‘Well, I’ve got the list. All you have to do is tell me yea or nay.’ They enjoy that. It gives them a feeling that we are really taking care of them,” he says.

A Trusted Partner
GE Healthcare’s eHealth Information Exchange was chosen for the project, largely due to Inova’s past success working with GE Healthcare to implement the Centricity Enterprise™ Electronic Health Record (EHR) to manage inpatient care, according to Geoff Brown, senior vice president and CIO. “It was an opportunity for us to address the huge challenge of not having a health information exchange at the local and regional level,” he says. “This project allowed us to take a segment of that exchange in the medication arena to determine if having that information enables us to manage patients more effectively. And we are starting to really see the benefits.”

“NoVaRHIO is providing funding for the pilot, supported in part by a grant from the Commonwealth of Virginia as well as in-kind contributions by the various partners. Securing that grant was a highly collaborative process and critical to launching the project,” says Jane Woods, a founding partner of the NoVaRHIO steering committee and former Secretary of Health for the state of Virginia. “GE Healthcare functioned as a real partner to NoVaRHIO during the developmental process. The GE Healthcare people were extraordinarily helpful in sharing their expertise, developing schematics, and shepherding the project forward,” she says.
Standards Drive Growth, Reduce Costs

The MEDS-ED system at Inova Alexandria ED supports Stage 1 objectives for Meaningful Use of EHRs and health information technology as defined by the Department of Health and Human Services, and lays the foundation for more standards-based exchange of key clinical information, according to Edmond Magny, principal at Audacious Inquiry, a consulting group providing strategic guidance and project management. The MEDS-ED system is aligned with HITSP standards and IHE profiles, and the system has achieved semantic interoperability between disparate vendor EMR systems and medication data sources.

Future plans for NoVaRHIO include:

• Extending the service to other hospitals and health systems within Virginia
• Broadening the service to include laboratory and radiology results, allergy information, and admissions/discharge summaries
• Offering additional services including physician access and patient personal health records in accordance with NoVaRHIO’s “File for Life” initiative to use healthcare IT to support care coordination

Brown says that other emergency departments in the region have expressed interest in the MEDS-ED system. “Most organizations don’t have the diversity of skill sets to do a project like this,” he says, alluding to the cross-disciplinary team of IT experts from Inova, GE Healthcare, Picis, and Audacious Inquiry who worked on the project. “Our goal is to make it a standardized, repeatable process so as we bring more hospitals and individual practitioners online, they will be able to use existing protocols to communicate with us.”

“Increasing standardization is the future of healthcare information exchange,” says Brown. He cites the example of ATM machines that used to be bank-centric until the financial industry embraced standards for exchanging financial information. “Standards didn’t hurt competition. In fact, they helped the banking industry grow,” he says. “The same thing will happen in healthcare. We will be able to treat patients more effectively and efficiently and take waste out because information will be easily available from one location to another.”


About GE Healthcare
GE Healthcare provides transformational medical technologies and services that are shaping a new age of patient care. Our broad expertise in medical imaging and information technologies, medical diagnostics, patient monitoring systems, drug discovery, biopharmaceutical manufacturing technologies, performance improvement and performance solutions services help our customers to deliver better care to more people around the world at a lower cost. In addition, we partner with healthcare leaders, striving to leverage the global policy change necessary to implement a successful shift to sustainable healthcare systems.

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About NoVaRHIO
Established in 2007, NoVaRHIO works to facilitate the availability of accurate and timely electronic health records with the goal of improving the health status and healthcare of those who live and work in northern Virginia. Partnering with physicians, hospital systems, local governments, patient advocacy groups, free clinics and local businesses, NoVaRHIO has as its dual goals of furthering the development of a regional health information exchange and facilitating the adoption and interoperability of personal health records. NoVaRHIO is an active participant in the Commonwealth of Virginia’s statewide health information exchange efforts and is part of the Virginia Health Information Technology Advisory Commission (HITAC). It is recognized as a Virginia 501(c)(3) not-for-profit organization.

About Inova Health System
Inova Health System is a not-for-profit healthcare system based in Northern Virginia that consists of hospitals and other health services, including emergency- and urgent-care centers, home care, nursing homes, mental health and blood donor services, and wellness classes. Governed by a voluntary board of community members, Inova’s mission is to improve the health of the diverse community it serves through excellence in patient care, education and research. Inova provides a healthy environment for its patients, families, visitors, staff and physicians by prohibiting tobacco use on its campuses.

About Audacious Inquiry
Audacious Inquiry is a management and technology consulting firm with domain expertise in health information systems, web application development and analytical services. The company works in partnership with client organizations, including healthcare provider organizations, businesses, non-profit associations, and government organizations to maximize positive outcomes and minimize the risks of the practical application of information technology. The company is based at bwtech@UMBC Research and Technology Park, in Catonsville, Maryland. To learn more about AI, please visit www.aiq.com.

About Picis
Picis, a part of OptumInsight is a global provider of innovative solutions that enable rapid and sustained delivery of clinical documentation, financial and operational results in the emergency departments, surgical suites and intensive care units of the hospital.

Picis offers the most advanced suite of integrated products focused on these life-critical areas of the hospital where the patients are the most vulnerable, the care process is the most complex and an increasing majority of hospital costs and potential revenue are concentrated. Headquartered in Wakefield, Massachusetts, Picis has licensed systems for use in nearly 2300 hospitals in 19 countries. For more information about Picis, visit www.picis.com.

About Surescripts
Pharmacies, payers, pharmacy benefit managers, physicians, hospitals, health information exchanges and health technology firms rely on Surescripts to more easily and securely share health information. Guided by the principles of neutrality, transparency, physician and patient choice, open standards, collaboration and privacy, Surescripts operates the nation’s largest health information network. By providing information for routine, recurring and emergency care, Surescripts is committed to saving lives, improving efficiency and reducing the cost of health care for all.

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