



Virginia Mason Medical Center

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Stephen Von Bargaen
Cardiology Systems Administrator
Virginia Mason Medical Center

Heart Institute Introduces New Software to Support Electronic Data Management in Anticoagulation Clinics

Virginia Mason Medical Center Anticoagulation Clinic Highlights

Multi-Clinic Integration. Users from all seven clinics have access to patient information and plan of care. This data is available 24 hours a day, seven days a week.

Greater Efficiency. The flow of data is streamlined, reducing the average time it takes from initial finger stick to clinical care plan from several days to just over four minutes.

Enhanced Flow of Data, Improved Patient Safety. Immediate access to complete patient data reduces the risk of incorrect dosing adjustments.

Prepared for Newest JCAHO Requirements. VMMC is ready to meet new JCAHO requirements for reducing the likelihood of patient harm associated with the use of anticoagulation therapy.

High-Performing Multi-Site Clinic Requires Innovative System

Virginia Mason Medical Center is a non-profit comprehensive regional health care system that combines a primary and specialty care group practice of more than 400 physicians with a 336-bed acute care hospital in Seattle. In addition, Virginia Mason has a network of clinics located throughout the Puget Sound area. As part of VMMC's strategic plan, The Heart Institute at Virginia Mason has been continuously developing and implementing integrated information solutions to meet the needs of its various clinical areas.

In 2005, The Heart Institute at Virginia Mason turned its attention to the busy Anticoagulation Clinic, working closely with LUMEDX to provide software that would automate patient data management. The Anticoagulation Clinic had been delivering top-quality care since its inception.¹ The aim of developing an **Apollo™ Anticoagulation Module** was to streamline the flow of data so that clinicians and staff would find it even easier to care for their patients.

Addressing the Challenges of a Data-Heavy Clinical Area

Anticoagulation therapy involves vast amounts of highly complex clinical data. Managing this data and maintaining its integrity is critical to patient safety. Serving approximately 2500 patients at seven different clinics across the VMCC system, the Anticoagulation Clinic faced significant challenges.

Cardiology Systems Administrator Stephen Von Barga says the needs of the Anticoagulation Clinic dictated how the Module was built. “I worked with Jennifer George, Pharm.D., the lead pharmacist in the Anticoagulation Clinic. She would provide the clinical need, direction and describe the workflow. We would then sit down with a version that I had adjusted, try it out and fine-tune it. Afterwards, I would compile it and make it available for her to use for an extended period of time,” he says. “Of course, there was a little more to it than that.”

The Anticoagulation Clinic had been using a patient documentation system that was primarily manual, what David LaMarche, Director of Cardiac Services, refers to as “Stone and Chisel” record keeping. They also used IBM’s TSO application. The resulting workflow was cumbersome and slow. David recognized there was room for improvement—and innovation. He encouraged his team throughout the project and remained a steadfast supporter of addressing problems at all levels.

Some of the problems that pharmacists and the CVIS team wanted to address were:

- Excessive manual data entry
- Documentation in multiple, disparate systems
- Hand-written, hard-to-read and error-prone Clinic “Flow Sheets”
- Reliance on paper charts; minimal anticoagulation therapy information going into the hospital’s EMR
- Manual patient flag system
- High potential for misplaced records
- Data could be accessed by only one user at a time (local site only)
- Inefficient record retrieval

A Flexible Solution and Sensible Implementation

The Heart Institute at Virginia Mason decided to leverage LUMEDX’s strength in data reporting and its agility with interfaces and to work together to build software for their Anticoagulation Clinic. “We received the blank module from LUMEDX, and we were up and using it at all clinics within 18 months. We were building it as we went along,” explains Stephen. “We started with the input from the downtown clinic and two regional locations. We developed the module together with those three and then moved it out to the other regional clinics.”

¹Patients at the Clinic have a 70% lower risk of stroke and a 60% lower risk of major bleeding than the national average.

great applications

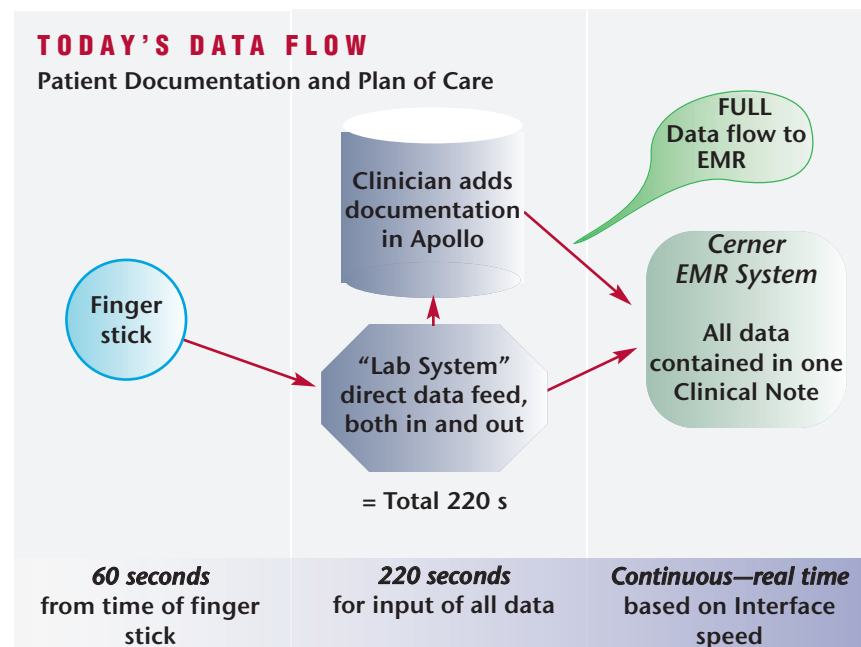
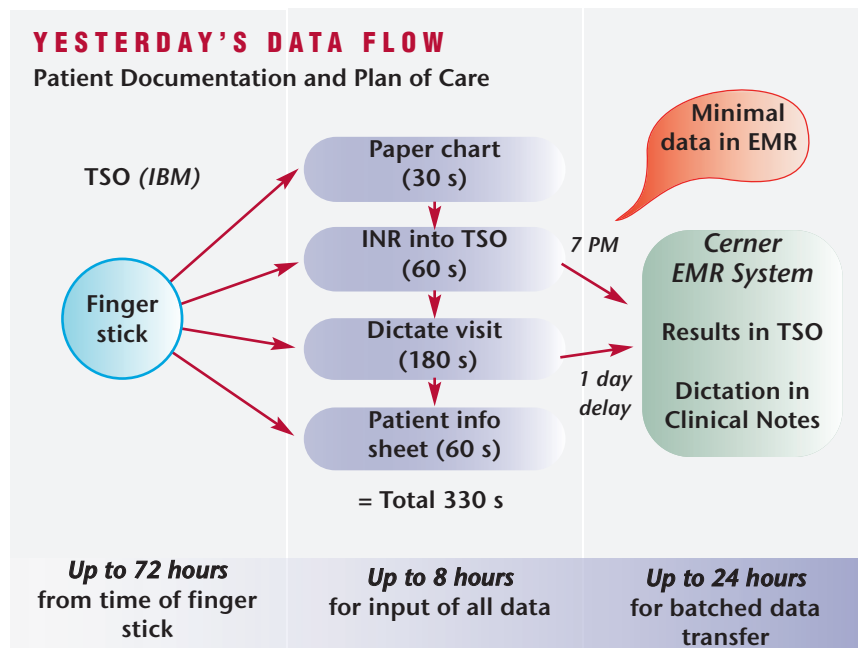
BUILDING CARDIOLOGY CENTERS OF EXCELLENCE

When it came time to go live, having multiple clinics was surprisingly helpful. The Cardiovascular Information System (CVIS) team at VMCC could learn what worked from implementation at one clinic and adjust plans before implementing at the next. "We'd do an offsite clinic and then wait a few months and get feedback from them. If we needed to adjust anything, we would. For example, we decided that it would help if I made groups in Apollo by site."

"We did data migration for the downtown clinic. We took a flat file and loaded that into the Apollo environment. That was how we were able to provide historical data for all patients," Stephen recalls. "It was pretty grueling for everyone involved, so for the regional clinics we decided not to do that. The regional clinics worked on both systems concurrently for a while. Each time a patient came in, new or old, he was entered into Apollo. Once every patient was 'touched' and in Apollo, they were able to phase out the old system. Depending on the number of patients in a clinic, this took from one month to three months—but it was a much easier way to deal with getting the data over and into Apollo than migration."

Less Paper, Quicker Data Flow Promote Patient Safety

Now that all the clinics are using the Anticoagulation Module, flow of data is smooth and quick. In the past, anticoagulation data input took up to eight hours and data resided in two separate locations, the paper Flow Sheets and TSO. It took nearly four days from finger-stick test until patient information and plan of care were documented in the EMR. Now this all takes just over four minutes and the system allows for more robust documentation in the medical record.



Benefits include:

- Single-source documentation
- Mistake-proof lab data transfer via an integrated lab system (interface)
- Direct, real-time results interface with the EMR
- Patient assessments imported to the EMR after each event, ensuring that all clinicians involved in a patient's care have access to data, regardless of whether assessment is complete or pending
- Records viewable by all staff
- Access to records is enterprise-wide
- Electronic messaging and tasking

"People appreciate that the individual paper records are no longer site-specific. Recently one of the pharmacists at VM Kirkland [a regional clinic] was sick. But one of our pharmacists downtown was able to cover her patients with no problems," says Stephen. "Cross-coverage is so easy now. Everyone was happy because no one physically had to go to Kirkland to get the patient information. The data they need is accessible from any site."

"Patient safety is a big issue with anticoagulation," says Stephen. Now that data is complete in the EMR and documentation is immediate, tracking dosages is much easier at The Heart Institute at Virginia Mason. Moreover, Stephen notes, "JCAHO has targeted Anti-Thrombolytic (coag) monitoring in 2008. This advance in tracking and record-keeping has helped to set the foundation for meeting these requirements."

Extending the Reach of the Chronic Disease Management Module

Successful anticoagulation therapy requires readily available, precise data. At VMMC's Anticoagulation Clinic, clinicians and staff can easily record, retrieve and review the information they need to provide their patients with best-quality care. The CVIS group at The Heart Institute at Virginia Mason is looking forward to further innovations. "In the future, we'd like to use dashboard reporting. We want to start tracking complications in real time. We want to start seeing patterns—if a pattern starts developing, we want to be able to see it right away. We want to provide real time outcome graphing. We're not really that far away from that," Stephen says.

"We'd also like to use the same type of system for for Amio [Amiodarone], medication used for rhythm management. There are a number of clinical areas with patients who are on drugs that we track. It makes sense to use the same system, especially because we have a group that's already using it well," explains Stephen. "We have high hopes that once we're up and running with CardioSchedule™ [Electronic Scheduling] and CardioManager™ [Performance Management System], we can use these tools effectively in a number of other areas."

LUMEDX SOLUTIONS AT VIRGINIA MASON

- Apollo Advance™ Clinical Data Repository
- Apollo Anticoagulation Module
- EP Lab Module
- Cath Lab Module
- Cardiac Surgery Module
- ClinDoc Clinical Documentation
- CardioDoc™ EP Structured Reporting
- CardioGate™ Interface Manager
- ACC Registry Module
- STS Adult Surgery Module
- COAP Registry Module
- HL7 ADT Interface
- HL7 LAB Interface