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Fulfilling Our Technology Vision Part 2: Medical Device Connectivity

Nancy Nelson, R.N., CMPE

Fulfilling Our Technology Vision

Part 2: Medical Device Connectivity

BY NANCY NELSON, R.N., CMPE



After successfully implementing an electronic medical records (EMR) system four years ago, everyone at Cardiology of Tulsa felt we had finally achieved our technology vision—one where physicians would have complete access to patient information both remotely and at the point of care. But we soon discovered the fast pace of technology innovation meant that our vision, much like technology itself, would be in a constant state of change.

While our previous efforts focused on going paperless and increasing electronic access to patient information, we were also interested in using technology to enhance patient safety and improve the deliv-

ery of care. So when an office move prompted our staff to purchase new diagnostic equipment about a year ago, we quickly identified an opportunity to connect these devices with our existing EMR—creating a seamless and more accurate method to capture, view, and record patient data at the point of care.

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This connectivity would allow us to accomplish two important goals.

First, it would support our goal of creating a more efficient work environment for our patients, staff, and physicians. As an electronic practice, we have found that leveraging technology in combination with our staff resources helps us to deliver a higher quality of care. Second, we also wanted to increase the accuracy of all the patient data we capture. Accuracy is especially crucial in the cardiology field because clinical decisions are often driven by precise, technical information. To ensure that we provide the best patient care possible, our physicians need real-time access to accurate and up-to-date patient data.

Bridging the Gap

With these objectives in mind, we approached NextGen Healthcare Information Systems, our EMR vendor, to determine how the application would work with medical devices. NextGen teamed with Welch-Allyn Inc., the medical device manufacturer, and our staff to build and install interfaces that would seamlessly transfer discrete data elements captured through the medical devices directly into the patient's central record within the NextGen database. Not only would this facilitate broader tracking and evaluation of patient data, it would also save our staff from having to manually enter information into the EMR, thus eliminating lost readings, transcription errors, and duplicate data entry.

Data output from all of the medical devices we purchased—including the electronic Spot Vitals

device and the PC-based stress and resting ECG machines—now flows directly into the EMR. This integration allows physicians and staff to seamlessly capture, view, and record data from a range of medical devices in a timely and efficient manner. It also enables us to develop and maintain more complete and accurate medical records for all of our patients.

More Accurate Results

It is a well-documented fact that paper recording of diagnostic testing propagates errors—ranging from inaccurate patient identification to lost readings. In fact, between 10 and 25 percent of all transcribed readings include some type of error, which puts patients at greater risk and increases the likelihood of medical errors. By integrating device data output into the EMR and making it immediately available to physicians, we have been able to eliminate these problems and make great strides in improving patient safety.

Device connectivity has also enabled us to standardize processes and minimize variations in the capture of clinical data, helping us to provide quality patient care more easily and efficiently. For example, when we relied on manual methods to capture vital signs, these variable techniques did not always produce consistent readings. This resulted in duplicate blood pressure readings being performed on a number of patients, often by a busy clinician. After replacing this sequential process with an automated electronic medical device that consistently captured all vital signs simultaneously, we were able to not only improve the quality and accuracy of every reading, but also eliminate the potential for errors. We now take fewer duplicate vitals readings and have also improved the quality of our documentation, which helps us to reduce risk and optimize reimbursement.

Improving Processes

Because the user interfaces for the connected devices are both intuitive and easy to use, we were able to quickly realize efficiencies in everyday processes. Our physicians are especially pleased with the tight integration because it eliminates the need to sort through lengthy paper reports or interpret hard-to-read faxed copies of test results. The integration between our EMR and medical devices has also helped to enhance communication between physicians, staff, referring providers, and patients, leading to a more collaborative and efficient work environment.

With immediate, enterprise-wide access to diagnostic information, physicians can now review and interpret test results for resting ECGs and stress tests remotely through the EMR. This not only speeds the turnaround of test results but also makes patient diagnostic information more readily available to physicians at the point of care, helping to generate alerts of important changes in a patient's status. Charges for the ECG tests are then automatically routed to our practice billing system, creating a seamless process for managing these tests from beginning to end, a major improvement from the days of manually faxing multiple page reports and re-keying patient information when it could take up to 48 hours for the test results to appear in the EMR.

The use of connected devices has also allowed us to streamline the capture of vital signs for all patients, minimizing the amount of time patients remain in the reception area or exam room and saving valuable staff time. With fewer steps than manual processes, the digital capture and integration of patient data allows diagnostic information to be gathered and recorded quickly and efficiently. As a practice that sees almost 20,000 patients a year, shaving just 1-2 minutes off this process really

helps to streamline patient flow. In fact, we estimate this saves our practice 496 hours of staff time per year.

Without test results to scan into the EMR or paper documents to shred, our providers also have more time to devote to patients during the encounter, especially during the treadmill and recovery portions of stress ECG tests. Together, these process improvements have resulted in increased levels of patient satisfaction, a more efficient use of practice resources and a safer care environment.

Once the data is in the system, it can be used for outcomes analysis, helping us to further improve the quality of care we deliver to our patients. Most recently, we used this data to determine which patients would benefit from the use of a defibrillator. Previously, this exercise would require our staff to manually review the results of each EKG test to identify appropriate candidates, a time-consuming and costly process. Now, we can just query the system and cross-reference the patient list with the most recent test results, all in a matter of minutes.

Impacting the Bottom Line

By bringing us one step closer to a paperless office, device connectivity has allowed us to realize a host of administrative and financial benefits, ranging from improved workflow and more accurate documentation to increased productivity and reduced supply costs. To this point, the use of connected devices will save our practice approximately \$33,215 per year in reduced full-time employee (FTE) and supply costs.

Before we built the interface between our medical devices and the EMR, each stress ECG test generated as many as 30-40 sheets of paper, which were then shredded once the information was scanned into the EMR system. Annual paper costs were \$8,399 for the treadmill

Cardiology of Tulsa Annual Return on Investment Using Device Connectivity

	Annual ROI
Full-time employee savings resulting from fewer manual, paper-based processes	\$ 12,272
Full-time employee savings resulting from shorter stress ECG testing process	\$ 7,961
Reduced paper costs for treadmill ECG testing	\$ 8,399
Reduced paper costs for rest ECG testing	\$ 583
Decreased shredding costs	\$ 4,000
Total Savings	\$33,215*

This figure does not include a one-time savings of \$12,000 for the elimination of six personal computers.

and \$583 for the ECG, and shredding costs were close to \$4,000. Now, the practice has completely eliminated these costs, for a total savings of about \$12,982 per year.

While our previous stress ECG testing devices required the use of two PCs—one to run the ECG and one to access the EMR—our new system allows us to both run the ECG and access the EMR through a single PC. By eliminating one PC in six of our exam rooms, we were able to realize a one-time savings equal to approximately \$12,000. This new configuration has also allowed us to redirect the staff resources required to complete each stress ECG test. Previously, two FTEs were required to complete a stress ECG test—one to record blood pressure and pulse readings and one to manage the testing device. Now, one employee can complete this job while the other preps the next patient. This shaves approximately ten minutes off of each stress ECG test we administer, resulting in a .25 percent savings in FTE tech time, equal to \$7,961 per year. In addition, by eliminating all FTE time spent managing a paper-based process, we have realized a \$12,272 savings in staff time per year.

This increase in productivity has allowed us to effectively respond to growing patient demand without having to hire additional staff. As a growing practice, this benefit is

extremely valuable, as it allows us to simultaneously control costs, improve patient satisfaction, and increase quality of care. Additionally, these automated procedures have simplified the process of opening new satellite offices. We no longer have to accommodate multiple file cabinets for paper storage, which increases the amount of space we have available for revenue-generating activities.

Much more important than any of these financial perks, however, has been our ability to increase the accuracy of testing data and improve patient safety, as well as to enhance overall operating efficiency. By streamlining multiple practice processes, physicians now complete patient encounters in a more timely fashion, which keeps the entire practice on schedule, thus ultimately improving patient satisfaction.

Reaping the Rewards of Connectivity

Since implementing the EMR, our practice has been in a constant state of process reengineering and improvement. From driving out time-consuming, paper-based processes to improving the capture of diagnostic testing information, we continue to find new and innovative ways to streamline workflow and enhance the delivery of care. We attribute our success to the transforming power of technology, which has allowed us to make our vision of

a paperless practice a reality.

Nancy Nelson, R.N., CMPE, is chief administrative officer, Cardiology of Tulsa, Tulsa, Oklahoma.