

A Lab in the ER to Speed up Evaluation

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U.S. Healthcare Reform is forcing hospitals to reassess their protocols and engineer their clinical workflow processes differently than before. An efficient workflow with early and accurate diagnosis should reduce costs, decrease readmission rates, and improve patient satisfaction. The Floyd Medical Center in rural Georgia meets the challenge with integrated diagnostics for evaluation of patients with chest pain.



A bright green building facade greets visitors to the Floyd Medical Center from afar. That is only one of many features contributing to the friendly atmosphere of this 304-bed hospital in Rome, Georgia. The freshly mulched flower beds are impeccably maintained, a grand piano in the lobby invites patients, staff and visitors to play up a tune, colorful posters, dangling from hallway ceilings, sway in the breeze and remind passersby to "call 911 when you have chest pain". Floyd is determined to keep up the positive spirits, while meeting the daunting new challenges of healthcare reform.



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The multiple demands of the Affordable Care Act (ACA), passed in 2010, put enormous burdens on hospitals like Floyd. The Medical Center serves a population of 350,000 in the impoverished rural, northwestern corner of the state. Georgia has opted out of the ACA Medicaid expansion program, which provides health insurance coverage for most of the poor. "We face new demands, but the number of poor, uninsured patients, unable to pay, will remain unchanged", explains Alison Land, Vice President at Floyd. Insurance reimbursement penalties under the ACA, which punish hospitals for exces-

sive readmissions or lack of compliance with increasingly strict standards of quality of care, are especially painful for places like Floyd.

In spite of the pressures, Land could not be more upbeat: "We anticipate changes here. We are ready for the future, thanks to constant vigilance and improvements". Her obvious enthusiasm for making Floyd a better place has deep roots. She was born in the hospital and both of her parents worked here as physicians. "Floyd is in my family's blood but I preferred to not work directly with blood", she

laughs. Instead she chose a degree in healthcare management and joined the Floyd staff 15 years ago. These days she helps oversee the hospital's difficult transitions under healthcare reform.

Recent improvements in the emergency department (ED), target the diagnosis and treatment of that most costly of indications: Cardiovascular disease (CVD). CVD costs the U.S. \$475 billion each year. At Floyd and most other EDs chest pain, a frequent symptom of heart attack, is the second most common reason for patients'



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A Siemens Dimension EXL 200 Integrated Chemistry System



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Alison Land
Vice President for Ancillary Services,
Floyd Medical Center, Georgia

visits. Yet in about 60 percent of admitted cases the symptoms turn out to be of non-cardiac origin, resulting in avoidable annual costs of approximately \$8 billion. These expenses are decreased, when physicians are able to distinguish early and accurately between patients with heart attack and those with other conditions.

No Waiting Time with Chest Pain

Floyd recently acquired the tools necessary to rule out non-cardiac patients at an early stage with a high degree of confidence. When patients visit the ED with chest pain today, everything is in place for their instant medical attention. There is no waiting time, they are put into a bed immediately, an initial ECG (electrocardiography) is performed, phlebotomists draw blood upon starting an IV, cardiac biomarkers are measured on the premises and the data made available to the attending physician within minutes. If signs point to acute coronary syndrome, patients are rushed to the cath lab for reperfusion therapy. In one memorable case just 33 minutes passed, between the time a patient entered the ED and removal of the obstructing clot with balloon angioplasty. Patients in a “grey area” of



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indeterminate diagnosis undergo a stress test or are transported to another clinic for a cardiac CT.

Floyd recently acquired the tools necessary to rule patients in or out rapidly with a high degree of confidence. A typical case is that of a 54-year-old woman, who arrived at the ED by ambulance one morning. The account manager at a local engineering company had been working at her computer, when she experienced sudden chest pain, felt dizzy, nauseated, and started sweating profusely. At Floyd, everything was in place for her instant care:

- The patient was put into a bed immediately and doctors performed an initial ECG.
- Phlebotomists drew blood upon starting an IV.
- The specimen was processed and tested for cardiac biomarkers in a lab, conveniently located in the ED. Within minutes the data were available to the attending physician.
- In this case the ECG and elevated troponin levels pointed to an acute coronary syndrome.

- She was rushed to the cath lab down the hall, where doctors initiated balloon angioplasty and placed a stent into the obstructed artery.

In this remarkable case, just 33 minutes passed between the time the patient entered the ED and removal of the obstructing clot. The patient was released from the hospital two days later but her care did not end there. A nurse from Floyd called her at home to make sure she was taking the prescribed medications and reminded her of her follow-up appointment with her primary physician. The patient has since followed her doctor's advice. She watches her diet, exercises regularly and has lost twenty pounds.

Time is Heart Muscle

Such rapid passage through the system was hardly possible before January of 2012. At that time Floyd added a STAT lab to its ED. There had been some difficult decisions to be made. "We are essentially landlocked here; expanding the square footage of the facilities was not possible. We wanted to add a lab but did not really have the space, nothing seemed to fit", explains Land. The solution: A Siemens

Dimension® EXL™ 200 Integrated Chemistry System, which has a very small footprint.

The ED-STAT lab performs a troponin immunoassay which considerably improves sensitivity and precision compared to conventional assays. Therefore, cardiac troponin I levels can be detected at much lower levels remarkably increasing confidence in the results.

Both professional laboratory and clinical organizations recommend the use of these precise and sensitive tests, which deliver reliable results with low sample volumes and can, under some circumstances, detect areas of cell death as small as a single gram. As another plus at Floyd, the ED-assays correlate with those performed by a larger Siemens system (Dimension Vista® 1500 Intelligent Lab System) in the central lab, where in-patients' specimens are sent. "For our physicians this harmonization of methodology is vital. They trust the results because they can directly compare values for patients who transition from the ED to in-patient," explains laboratory director Dianne Nichols.

The lab in the emergency department has been a decisive factor in speeding up evaluation of patients presenting with chest pain. Before, specimens collected in the ED were sent by pneumatic tube to a distant central lab. Moreover, Floyd uses the priority panel feature on the Dimension EXL system to sample the specimen and report the troponin 1st, before other assays are complete.

Thanks to the new lab, “vein to brain-time,” the interval between obtaining a patient’s blood and availability of results to the physician, has decreased by an average of 9 minutes. The fast turnaround ensures that Floyd consistently meets AHA/ACC-guidelines (American Heart Association, American College of Cardiology) for “door to balloon” time. According to the guidelines, interventions such as balloon angioplasty, placing a stent or surgery have to be initiated within 90 minutes after a patient with chest pain enters the emergency department. “Time is muscle, meaning heart muscle”, says Land. “Before we installed the STAT lab in the emergency room, we were taking a big part of those 90 minutes just for lab work”.

Resolving an ED Bottleneck

For a large percentage of individuals presenting to the ED, the initial diagnosis is indeterminate. These “grey

zone”-cases are held for further observation or sent to undergo a cardiac stress test. At Floyd, the workflow from ED to stress testing has been greatly improved recently with the installation of a Siemens Symbia S with IQ SPECT cardiac software. The machine has reduced the average time of stress tests from 27 to 10 minutes. The bottleneck of ED patients requiring stress testing has since been resolved.

The new imaging technology clearly boosts staff morale. Dyrece Evans is the certified nuclear medicine technician running the machine on a recent busy day. “On several days this week, patients were lined up one after the other. Before we would have run into problems. This machine makes all the difference”, she explains happily in a charming Southern accent. She has the numbers at her fingertips: “We are down to six minutes resting, four minutes stress, I love it.” The shorter procedure makes a decisive difference for the high number of elderly and obese patients, who cannot tolerate a longer scan. In some cases the IQ SPECT now provides quality imaging information where it would not have been possible to even attempt imaging before.

Integrating ED-related lab work and imaging technology has been a tremendous asset for the hospital’s

workflow. Now physicians have the tools to confidently identify patients needing intervention within the time frame specified by AHA/ACC guidelines. Compliance with guidelines of professional organizations first and foremost saves lives. In the times of healthcare reform, adherence to best practice guidelines also is vital for a hospital’s bottom line. Under the ACA, the federal government continuously disseminates new directives with the goal of improving quality of care. Non-compliance results in costly financial penalties.

Readmission Rate Decreased by 62 Percent

At the vanguard of the ACA’s efforts to curb growing healthcare spending is a crackdown on costly readmissions. One of the law’s provisions penalizes hospitals, when an excessive number of patients, insured under the federal Medicare program – all Americans 65 years old or older – are readmitted with the same indication within 30 days. With nearly one in five Medicare patients returning to the hospital within a month, about two million people a year, readmissions cost the government more than \$17 billion annually.

Heart attack and heart failure, along with pneumonia, are the conditions, which the federal government presently monitors for excessive rebounds.

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Certified Nuclear Medicine Technician,
Floyd Medical Center, Georgia





In the first year of enforcing the provision, Medicare levied penalties against 2,217 hospitals with too many readmissions. Of those hospitals, 307 received the maximum punishment, a 1 percent reduction in Medicare payments for every patient over the following year. The maximum penalty will increase to 3 percent by 2015.

Floyd has repeatedly aced the federal readmission evaluation. In the past years, the hospital's readmission rates for heart attack and heart failure decreased by remarkable 62 percent. "We perform well above the national average", says Land. Integration of lab tests and imaging procedures, ensuring a fast and accurate diagnosis in the ED, contribute to the impressive numbers. Physicians can confidently keep patients with harmless non-cardiac conditions from being admitted. Diligently overseeing the transition of inpatients from hospital to home or another medical facility also keeps rebounds down. At Floyd, nurses call all patients after they have been released, making sure they take their medication and that they receive appropriate follow-up care.

Keeping Patients and Staff Happy

Fast medical attention and short stays in the ED are factors that keep physicians and staff happy. They also drive patient satisfaction. Under the new health law, an unhappy patient translates into increased costs. As a financial incentive to improve treatment, the federal government last year began meting out bonuses and penalties to hospitals based on their quality of care. Quality measurements at this time include the death rate, the number of medical mistakes and infections from catheters. A full 30 percent of the quality score is based on surveys of patient satisfaction, which every hospital has to take.

Floyd seems to know how to keep its patients happy. Every morning the staff spends "huddle time", discussing the important issues of the day and sharing feedback from patients. "It makes my day when we get a glowing review and it encourages me to do even better", says Administrative Laboratory Director Dianne Nichols. Timely quality medical atten-

tion is of course key to patients' positive experience. A warm and welcoming atmosphere also helps. In that respect, the hospital has made some recent changes. Land: "Now staff greets each other in the hallways, we accompany visitors to their destination instead of vaguely giving directions, and everybody does their part to keep our premises neat and free of litter." And this energetic VP practices what she preaches. On a short walk from her office past shrubs and flower beds to the lobby she bends down three times to pick up and dispose of pieces of trash, none of them bigger than a gum wrapper.

Silvia Sanides, has been working for more than 20 years as Washington-based science and medical correspondent for German print media (Focus magazine), radio and TV. A scientist by training (Masters in Biology), she has covered a wide variety of topics in medicine, health and future technologies.

The outcomes achieved by the Siemens customers described herein were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption), there can be no guarantee that others will achieve the same results.