DEEP DOMAIN™

Case History

Swedish Medical Center Makes Meaningful Use Of Emergency Department EHS Data

Problem

The Emergency Department at Swedish Medical Center in Seattle cares for more than 107,000 emergency room patients each year at four suburban locations and two urban sites. Dr. Brian Livingston, director of the ED, and Dr. Bob Seale, a former ER physician turned medical informatics specialist had long been convinced the throughput for the emergency department needed to improve. Like most administrators in their shoes, they initially approached the problem in logistical terms: if they just had one more exam room and a few more staff members, they would find greater efficiency.

In an effort to explore solutions to the problem, they hired a firm to conduct a lean tech workshop analyzing their procedures with 25 to 30 members of the Emergency Department. The consultants had the staff set up a mock ER and then ran a series of simulations hoping to identify bottlenecks in procedures. In the first simulation, they ran the ER using their current procedures and were able to complete about 60 percent of the cases in the allotted time. In the second simulation, they were told to operate the same way, but without talking. They found that they got through 80 percent of the cases in the same amount of time. In the final simulation they were to operate with no talking, one less nurse and one less room. Again they were amazed at how many more patients they put through the department.

The exercise was an eye-opener. They now knew it was not a logistics problem. However, they still didn't know where to begin making changes to increase throughput. They needed data to identify bottlenecks. Then they could use the training exercises to make changes and measure the effects.

Swedish had successfully implemented an EPIC electronic health records system in the emergency department the previous year. They asked the IT department for a report showing their length-of-stay times. After several weeks of communication back and forth they got a Clarity report on length of stay. But by then, they decided they also needed to look at door-to-doc times. Several more weeks and they had a Clarity report showing door-to-doc times. The problem was that getting the information they needed out of the EHR system was too cumbersome, too generic and too limited for them to make changes, rapidly evaluate them and make more changes.

SWEDISH

Customer Profile

Swedish Medical Center in Seattle is the largest private non-profit medical center in the six-state Northwest region. It cares for 43,000 inpatients annually and has 8,500 employees, 3,000-physicians and 1,200-volunteers working at four hospital campuses. Swedish Medical Center Emergency Department includes six ERs with two major urban ERs and four freestanding suburban ERs serving over 107,000 emergency room visits annually.

Business Objective

The Emergency Department wanted to find efficiencies that would increase throughput at its six ERs without increasing space or staff.

Problem

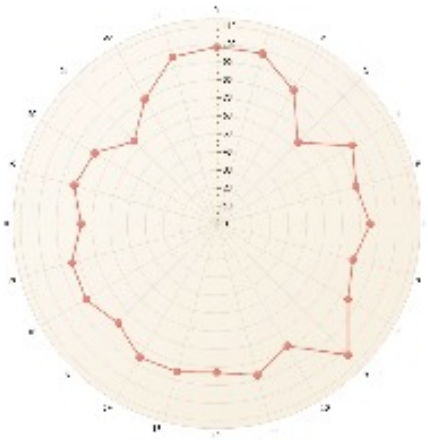
The Medical Center's EPIC EHR had been collecting Emergency Department data since Spring of 2007. While the EPIC system was extremely sophisticated and powerful, getting the data regarding a variety of time points was cumbersome and limited.

Solution

Deep Domain's Emergency Department Analyzer put the ability to develop and generate reports on door-to-doc, door-to-room, length of stay and a variety of other time points in the hands of end-users, without the need for complex spec requests to the IT department, or costly training.

Benefits

- Reduced door-to-doc time from 52 minutes to 20 minutes
- Analyze length of stay by hour of day, staffing, or diagnosis acuity
- Reduced ER diverts by 100%
- Put analytic ability in the hands of end-users with little training required
- Patient data was secure and not affected by end-users
- Fast development time, works with any EHR



"This is a 1-month graph - the longer the time line, the more the graph will smooth out, but I can also look at several one-month graphs in a row - it almost looks animated if I click June, then July, then August - what I notice is there is a trend toward longer lengths of stay beginning at about 9 am that tends to improve around 6-9 pm, then lengthens out by midnight. This is why we nickname this the Discovery Tool because only now can I ask whether we have some issues in the department that are causing this - a couple ideas that jump out are when physician double-coverage starts and ends, when do nurses take their meal breaks."

Dr. Bob Seale, Medical Informatics, Information Services, Swedish Medical Center

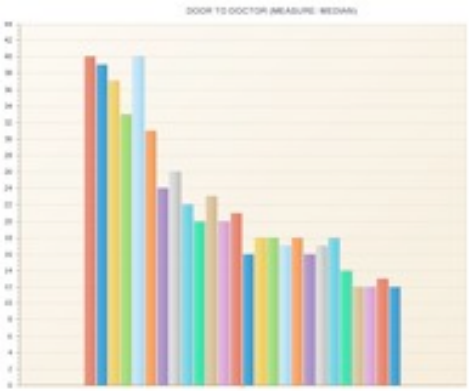
Solution

Dr. Seale learned about Deep Domain, a health IT company, from colleagues within the Swedish system who were using Deep Domain technology to extract data from the EPIC database for diabetes management. It allowed the end user to define their own reports and generate multiple variations in minutes, enabling clinical managers to look at a patient's critical data, such as LDLs, blood glucose, and a dozen other parameters and to measure and monitor patient and physician performance. The reports could be created separately, or stacked, or defined a dozen different ways.

Doctors Seale and Livingston asked Deep Domain to apply its technology to the emergency department – but instead of patient data, they wanted to track a variety of time measures including door-to-room, door-to-doc, doc-to-discharge and length-of-stay. And they wanted monitor performance against those measures in as close to real time as possible. Deep Domain did all that and more. With the ED Analyzer, the physician administrators were able to discover hidden bottlenecks at different times in the schedule and produce in depth reports on a variety of parameters – including efficiency by individual physician. Coupling the Deep Domain data with their lean tech experiments, they were able to systematically try different procedural changes, and then quickly see whether there was an effect on performance. With the ability to serialize changes and quickly evaluate the result using the Deep Domain ED Analyzer software, they made dramatic improvements in throughput.

Results

Swedish Emergency Department has been able to steadily reducing door-to-doc times from 52 minutes in 2008 to 20 minutes in the first year of using the ED analyzer tools. Dr. Livingston says, that because of the reduced time in exam rooms, they've completely eliminated diverts.



Swedish Emergency Department's Door-to-doc times have steadily declined using Deep Domain's ED Analyzer.

"In 2008, we had 1086 hours of divert. Since March 26, 2009, we have not had a single hour of divert time.

Seale says one of the obstacles of using the data contained in the EPIC EHR is the language barrier between clinical people and IT people.

"Not knowing what to ask is a huge hurdle," he says. "With the Deep Domain ED analyzer, our end users can ask the questions themselves and instantly define and generate reports to answer their own questions. We are able to identify problems that we didn't know we had. The result is patient satisfaction is dramatically higher."