

## Core Case Study: Clinical Value

**Applicant Organization:** Lakeland HealthCare  
**Organization's Address:** 1234 Napier Ave; St. Joseph, MI 49085  
**Submitter's Name:** Tyson Stewart  
**Submitter's Title:** EHR Senior Analyst  
**Submitter's E-mail:** [tcstewart@lakelandregional.org](mailto:tcstewart@lakelandregional.org)  
**Menu Item:** Clinical Value

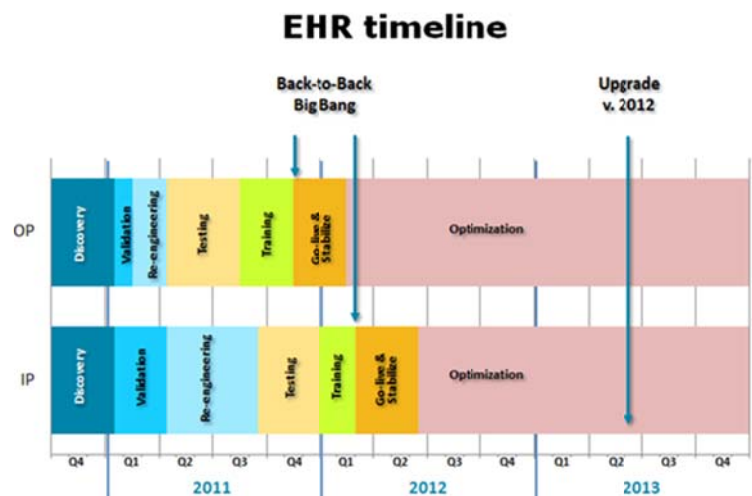
### Executive Summary

Lakeland HealthCare set forth in 2010 with a mission to not only successfully implement an electronic health record (EHR), but to truly deliver on the promise of EHR. Lakeland used a “speed to value” approach to save on implementation costs, but also to reach the optimization stage sooner. This coupled with a benefits realization project to identify opportunities and promote accountability allowed us to not only deliver expected improvements, but to go above and beyond. This resulted in various projects that deliver results in reducing radiation exposure to at-risk patients, performing above national top-decile on sepsis mortality rates, performing above national benchmarks in influenza immunizations, and receiving the Michigan Governor’s Award in our Core Measures performance.

### Background Knowledge

Lakeland HealthCare is a not-for-profit, community-owned system of care serving a tri-county region in southwest Michigan. Lakeland HealthCare has three hospitals, approximately 30 ambulatory clinics and in addition includes long-term care, home care and hospice services. Lakeland has 443 licensed beds and more than 4200 employees making it the largest employer in Berrien County. The Lakeland mission is “To enhance health and serve our community” and our vision is “To positively transform healthcare and the health choices of those we serve and employ.”

In 2010, Lakeland recognized that there was a need to transition to a fully integrated EHR in order to meet and exceed the requirements of the Affordable Care Act and Meaningful Use. In late 2010, Epic was chosen as the vendor of choice for our EHR project. Using a “speed to value” approach, Lakeland then began an aggressive timeline for implementing the EHR, and was fully operational on it by early 2012 for hospital, ambulatory environments, and many community practices. This emphasis on “Speed-to-Value” enabled us to get to optimization faster where real clinical value initiatives could be identified and implemented.



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### Local Problem Being Addressed and Intended Improvement

The move to an EHR would provide Lakeland the ability to standardize care through the use of evidenced-based guidelines and clinical decision support tools. Implementing such functionality would ensure that compliance for Core Measures and other regulatory requirements were achieved. Transitions of care between hospital and ambulatory visits could be more tightly coupled; ensuring providers received a complete view of a patient's medical history.

There were also clear opportunities for improving the safety, quality and accuracy with which care was delivered to patients. This could be achieved through a closed loop medication process, including bar-coded medication administration, and CPOE to reduce the number of Adverse Drug Events (ADE's). The ability to monitor and report on patient information in real-time would also provide opportunities for patient vital sign acuity monitoring (VSA) and INR tracking compliance.

With the implementation of the EHR a robust clinical decision support system for quality and safety initiatives would be developed as a means of assisting providers in delivering the highest level of care and outcomes for their patients.

### Design and Implementation

In late 2010, Lakeland selected the EHR developed by Epic Systems. The decision was predicated on the desire to have a fully integrated EHR system for patient care to reduce implementation and maintenance challenges and allow for a single patient record across both hospital and ambulatory visits. Selecting an industry leader would also provide flexibility and allow Lakeland to take advantage of proven workflows and practices.

The ConnectCare department was formed for the EHR's implementation and the subsequent system optimization and maintenance tasks. This department was subdivided into application teams which collaborated with key stakeholders to ensure that the build reflected evidence-based practices. Standardized clinical workflows were then designed and implemented to meet the needs of providers and enhance current quality and safety initiatives.

Improvement in clinical outcomes required a focus on improved efficiency through automation, increased accuracy and commitment to enhanced patient care through real-time monitoring and clinical decision support tools. As a result, efforts were focused on ensuring the following areas were addressed.

#### **Standardization of Clinical Workflows**

With the implementation of the EHR, documentation could be standardized to ensure key information was captured and conveyed using orders, documentation flowsheets, and notes. With the correct design, the EHR could also be flexible enough to allow the user to add personalized notations as needed. Order sets were designed to guide care in ways that were specific to the patient by using "If/Then" logic to cascade only the orders which met the patient's needs.

Placing an emphasis on standardization of workflows allowed for the development of clinical decision support tools based on evidence-based practices across the

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organization. This would ensure compliance with regulatory documentation requirements and support Core Measures initiatives.

### **Closed Loop Medication Process**

A closed loop medication process, including CPOE and bar-coded medication administration was implemented to reduce the number of Adverse Drug Events (ADE's) due to transcription and medication administration errors.

### **Preventative Monitoring and Alerting**

Lakeland needed of a way to monitoring a patient's condition in real-time. Efforts were put in place to ensure that predictive risk scoring systems would be implemented including the vital sign acuity monitoring (VSA) and Morse Fall Risk scale for fall prevention. These standardized tools would be valuable to increase the quality of care and bring documentation and interventions together within the system.

### **Tracking and Analytical Reporting**

Prior to implementing Epic, there was no centralized and accessible tracking system that incorporated both the inpatient and ambulatory settings. By utilizing templates, standardized documentation made it possible to track various health indicators over time. INR values, overdue immunizations and history, and Prostate-Specific Antigen (PSA) tests could now be monitored and reports created to alert providers and patients to any irregularity or outstanding task. Analytical reporting tools would also be employed to trend healthcare data over time.

To ensure that key EHR benefits were identified, Lakeland reviewed expected and potential benefits with a consulting partner. A list of key performance indicators (KPIs) was created. A governance structure for benefit realization was formed, and a project team of volunteers assembled. To track and ensure progress, a project team member, an organizational partner, and an executive sponsor took ownership of each KPI. The status of each KPI is reported at a quarterly meeting, and was also presented to the board of directors on a quarterly basis.

Post EHR implementation, Lakeland formed multi-disciplinary teams from various departments. Their goal was to uncover additional optimizations that would further enhance clinical outcomes and increase patient safety in their respective disciplines. Two committees were created from these efforts; the Sepsis Committee which focused on workflows for septic patients within the emergency department and the Patient-Based Radiation Safety Committee.

According to external benchmarking organizations, Lakeland HealthCare ranks high for safety and high for becoming even safer. Generally Lakeland places in the top 25% or better. That's safer than most other health systems, but it's still not safe enough. We took an additional step to become even safer. It is modeled after a practice borrowed from the nuclear power industry. It's called a Daily Safety Check-In. Here's how it works.

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Each day, leaders from around Lakeland huddle in our Administrative Conference Room or call in from remote sites at exactly 11:30 a.m. We reiterate our commitment to keeping everyone at Lakeland – patients, families, and associates – safe everywhere, every day.

We review anything that may have produced an unsafe situation within the last 24 hours and determine what we can do to fix it. We also review anything that might pose a safety risk within the next 24 hours and look for ways to prevent it.

Daily Safety Check-Ins are something we do every day of the week, including weekends. Those organizations that have implemented this process have found that it improves both safety practices and safety measures.

Lakeland has been doing Daily Safety Huddles since 2012. We keep a monthly ‘workbook’, an excel spreadsheet that Dr. Hamel, President and CEO designed, to share daily, which includes all risks identified, harm, near misses, others, as well as adding ‘safety shares’ – an opportunity for all to learn from an experience another department had.

There are 4 categories we cover in the call: Safe (no identified safety risks in the last 24 hours or 24 hours going forward), harm (a patient/associate/guest is hurt in some way, from very minor to significant), near miss (a risk is discovered before it actually reached the patient), and other (miscellaneous items).

Anyone can request a huddle after each check in to solve urgent issues as quickly as possible. We hold those at the end of the meeting. During huddles concerns are addressed real time, with all the folks identified that can help, and often resolved. Anything that remains unresolved remains on the agenda until a resolution can be reported.

Date: /2014		Last Serious Safety Event Days		Safe	Harm	Near Miss	Risk	Other	Instructions:				
Time: 11:30 AM		Last Fall w/Injury - X Day		0%	0	0	0	0	Report all conditions or events that pose(d) a safety risk to patients, families, and/or associates				
Hosts:		Today		0	0	0	0	0	Focus on the last 24 hours and the next 24 hours				
Yesterday		Today		0	0	0	0	0	Indicate whether you need help (Handoff or Huddle) to promptly resolve or remediate the condition				
SI		NL		WV						Items in Red - Follow Up Needed    Items in Green - Open Opportunities    Items in Purple - High Risk Patient/Follow Up Needed			
Area	Owner	Report	Events					Safety Shares	Summary	Handoff	Huddle	Notes	
			Safe	Harm	N Miss	Risk	Other						
Guest													
CCRS													
Cancer Center (Amb Infusion)*	Orue												
Outpatient Services*	Chad												
Surgery	Devenell												
Niles													
Lakeland Hospital/Niles	Debra/Jennie												
St Joseph													
Cardiac Telemetry - BA	Anita												
CCU/ICU - 2B	Barry												
Endo	Kari												
Emergency Department	Kathy												
EVS	Trevi												
Heart Center*	Bart												
Imaging/Nuclear Med & PET*	Angie												
Med Surg/Pediatrics	Laura												
Obstetrics/L&D - 3B	Brenda												
Ortho/Neuro - 3A	Barbara												
Oncology/Medical Care - 4A	Laura												
Periop Services*	Marilyn												
Psychiatric Services	Jean												
Rehab - 6C	Kari												
Post-Surg	Shalini												
Radiation Therapy*	Barbara												
Surgery	Ellen												
Watershield													
Lakeland Hospital Watershield	Chris												
Pine Ridge - Stoneville													
Pine Ridge	Patrick												
System Wide Departments													
Associate Health & Wellness*	Rita												
Biomed*	Allen												
Building Services	Walt												
Care Management	Lori Ann												
Central Processing	Genny												
Central Telemetry	Anita												
Connect IT	Sherry												

### How was Health IT Utilized?

Improvement in clinical outcomes requires a focus on improving efficiency and accuracy through automation, real-time monitoring and alerting, and clinical decision support tools to support infection control and drug related safety tasks. Lakeland’s technology plan along with the implementation of the EHR, were vital to achieving these goals.

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To support the efficiency and accuracy of data being entered into the EHR, Lakeland employed several technologies. CapsuleTech was employed to interface patient vitals directly into the electronic record. Medication bar-code scanning along with CPOE created a means of implementing a closed-loop medication administration process to reduce human error. Images from Lakeland's PACS system were also interfaced into the EHR to increase efficiency. It was important that the EHR and electronic chart were easily accessible at the point of care. As a result the commitment was made to ensure all patient and exam rooms contained computers along with deploying various additional devices for accessing the electronic system.

Prior to the implementation of the EHR, real-time monitoring and alerting was not possible. To support these tasks, Best-Practice Advisory (BPA) alerts were built into the system to notify providers of key care indicators. Through the capture of discrete data on standardized forms and templates, reports could be automated and trended, and scoring systems such as the VSA and Morse Fall Risk assessments developed to assist providers in assessing patient statuses at a glance.

The ability to capture discrete data has also enabled Lakeland to take advantage of several clinical decision support tools within the EHR. These clinical decision support tools provide clinicians with knowledge and person-specific information, intelligently filtered and presented at appropriate times, to enhance the quality of care received by patients and in turn improve clinical outcomes. Such tools were vital to Lakeland's success in their Sepsis and Patient-Based Radiation Safety programs.

Lakeland HealthCare utilizes a number of digital strategies to communication with patients and community members. We develop our focus based on what is engaging and personal to patients. Through social media and other digital platforms, we tell unique patient stories to highlight our quality, safety, and teamwork. We create social-only content in order to attract interest.

Engaging content is aligned with corporate goals, community education strategies, and key initiatives to promote messages that will help impact use of MyChart, falls prevention, medication safety, getting regular mammograms, etc. Over time, our engagement with patients has increased in this realm.

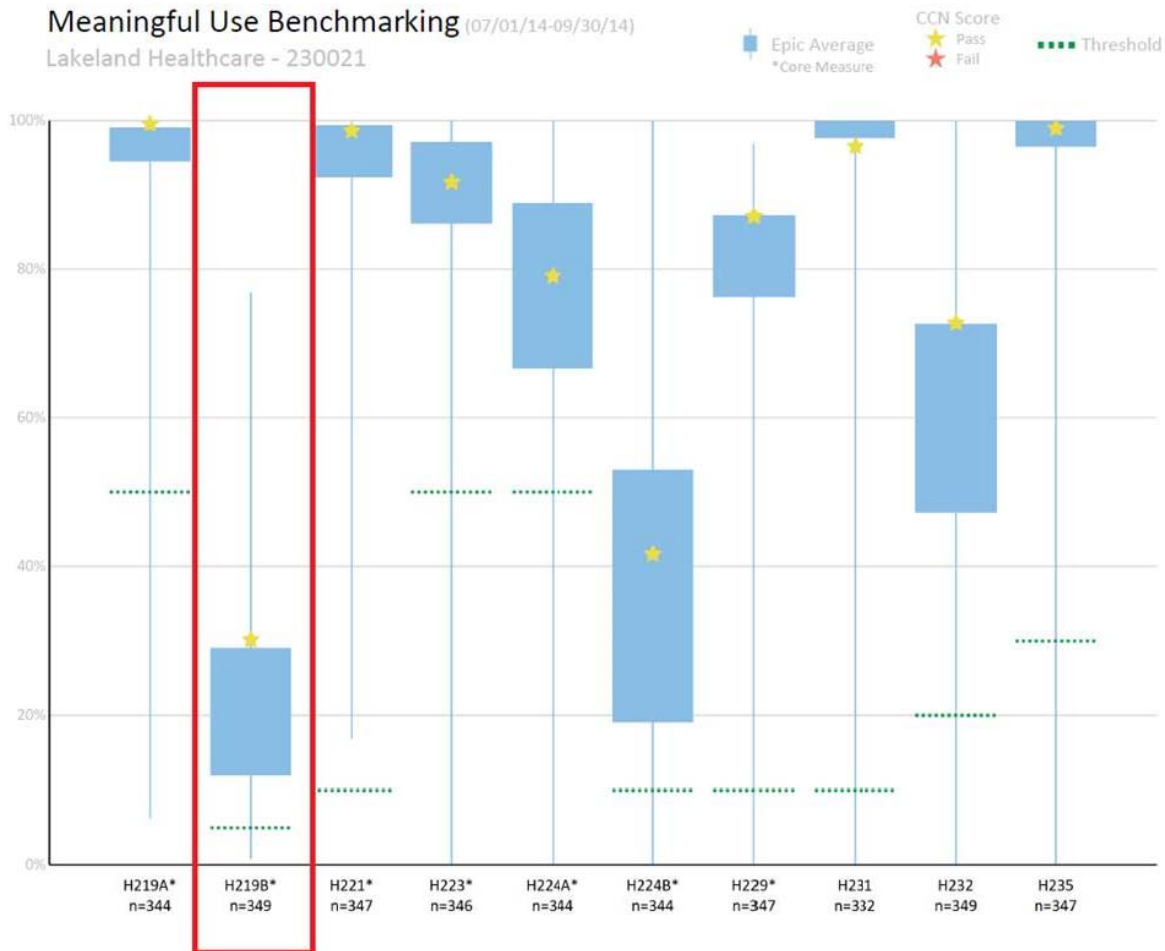
Our current metrics are:

- Website visits: 55,665 in October 2014 (monthly, vs. 42,137 in January 2014) 32% of visitors access via mobile
- Facebook likes: 2,331 as of October 2014 (vs. 1,233 as of January 2014)
- Twitter followers: 1,113 as of October 2014 (vs. 744 as of January 2014)
- YouTube views: 85,110 (vs 53,016 as of January 2014)

We are currently redesigning our website and re-launching it with a heightened view toward patient engagement. Incorporating applications, prevention email campaigns, ongoing nutrition and wellness tips, blogs, and other emerging formats will allow us to expand our efforts.

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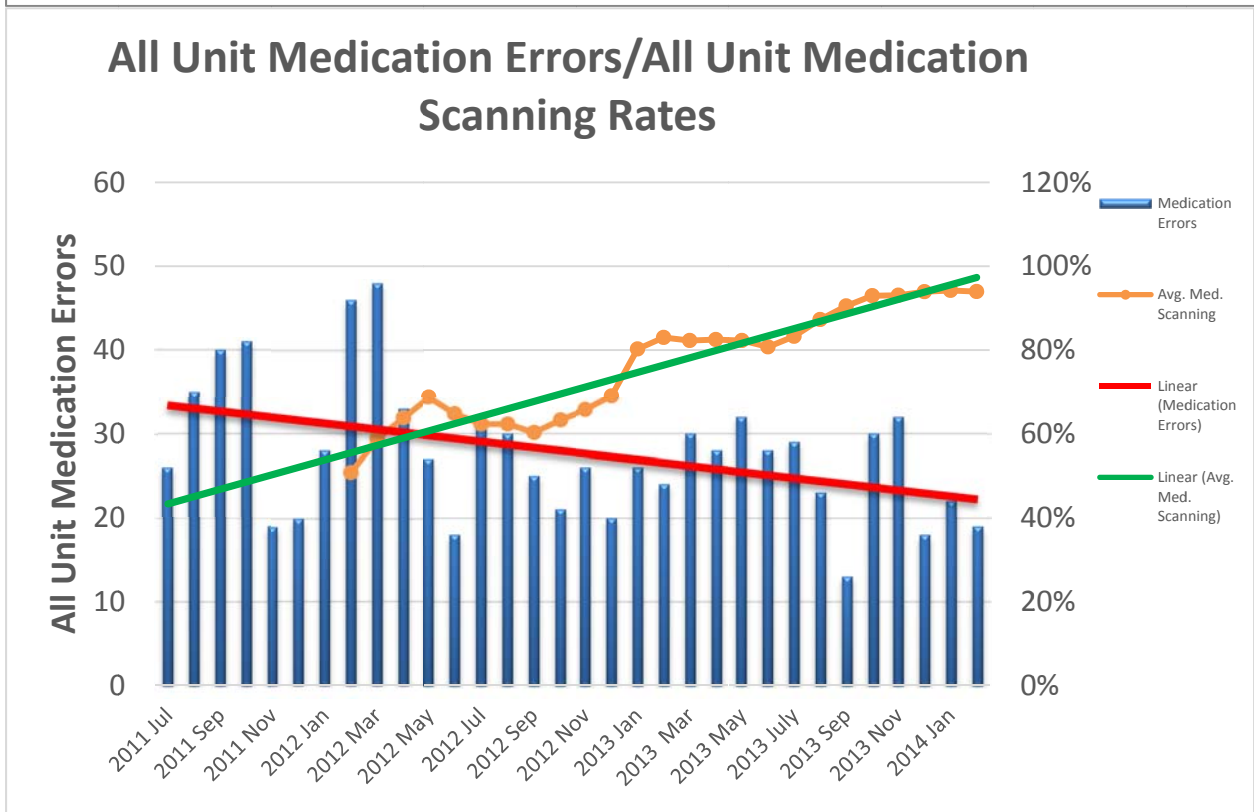
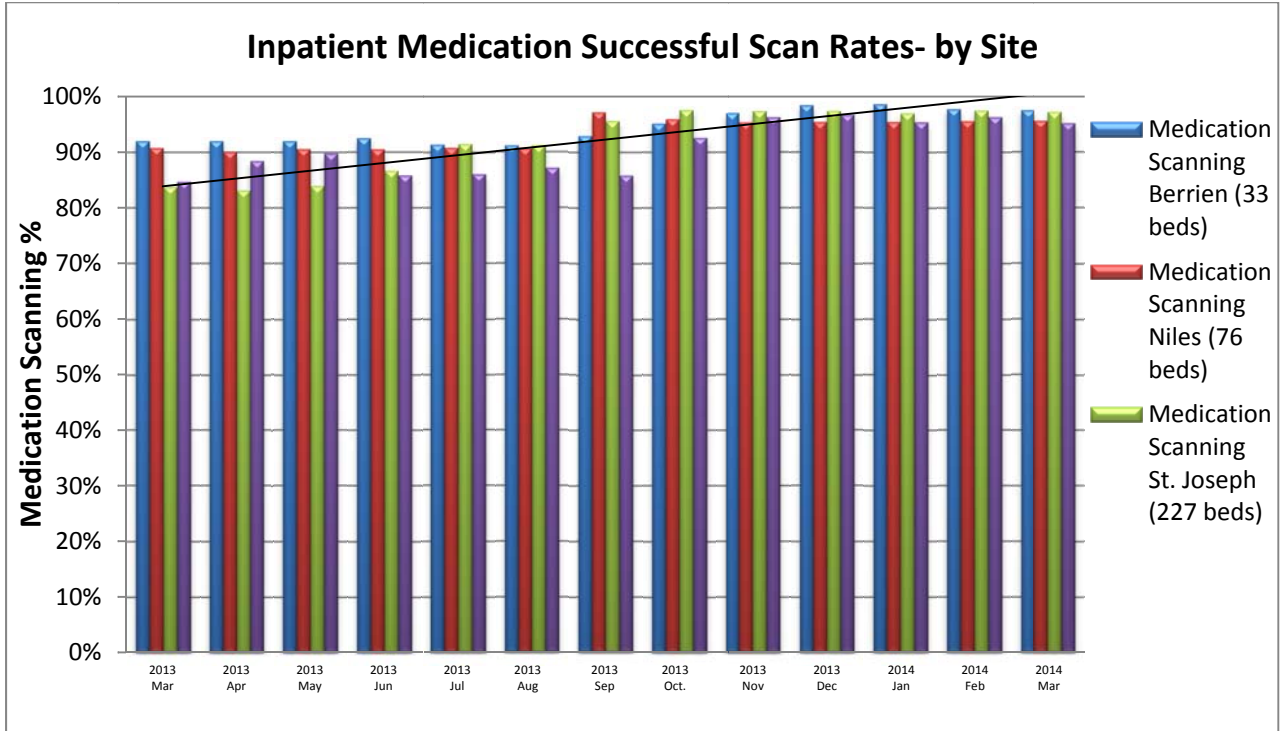
The graph below compares Lakeland HealthCare's Stage 2 Meaningful Use measurements against 349 other hospitals across 92 organizations nationwide. H219B measures the percentage of patients discharged from our inpatient or emergency departments that are logging onto our patient portal, MyChart, to either view, download or transmit their health information to a third party. There is a direct correlation between this measurement and patient engagement. Our patient centered approach to implementing features within our patient portal has made it a useful tool for our patients to take an active role in their healthcare needs.



### Value Derived/Outcomes

Since the implementation of the EHR, Lakeland has seen substantial improvement in clinical outcomes and decreases in safety and risk issues. Some of the significant results demonstrated from the project include a reduction in transcription related adverse drug events (ADEs) from 30 pre EHR implementation to 0 in 2013. Barcode scanning compliance rates have increased significantly, which has led to a reduction in the number of medication administration errors.

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Additional clinical outcomes and values derived are outlined below.

### Fall Prevention

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In 2012, Lakeland decreased overall fall rate by 11.6%, and falls with injury by 24%. During the same time period, overall fall rates increased by 12% in hospitals reporting data to the Joint Commission Resources Partnership for Patients Hospital Engagement Network (HEN). This includes 37 hospitals in 16 states.

### Immunization Tracking

Prior to our EHR implementation Lakelands influenza immunization rate was well below the national benchmark (37%); it is now above the national benchmark.

- Oct 2011 – 24.9% (EHR Go Live)
- Oct 2012 – 29.9%
- Oct 2013 – 39.1%

### Sepsis

Lakeland's sepsis program saw immediate effects of their Sepsis treatment changes. In the first quarter of 2012, the mortality rate was 16.67 %, and in quarter two it decreased to 9.63 %. In the initial three months of the implementation of the EHR, the mortality rate dropped 7%.

### Radiation Safety

The Patient-Based Radiation Safety Program launched in 2013 with a total of 9 patients. Currently, Lakeland has enrolled 57 patients in this program. In the first quarter after implementation, the BPAs were 33% effective in triggering the ordering provider to cancel or select alternative imaging for patients enrolled in the radiation safety program. Over a year later, the BPAs have maintained a total average effective rate of 40% with a total of 65 occurrences of a BPAs firing, prompting 26 cancellations or change to alternative imaging orders.

### PSA & MUSIC Quality Group

The combination of implementing the EHR and participation in the Michigan Urological Surgery Improvement Collaborative (MUSIC) program provides quality initiatives that enhance patient care. During the first month of participation, Lakeland's urologists reported zero complications. An EHR report was created for tracking patients with a diagnosis of prostate cancer and having not had a PSA and/or an office visit in the past year. The report uncovered 316 patients:

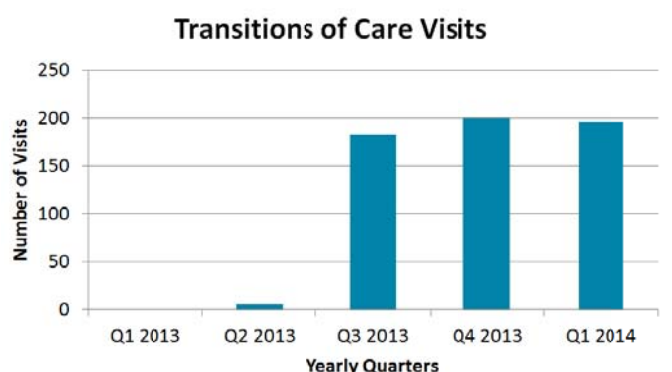
- 274 patients did not have an office visit in the past year
- 127 patients did not have an updated PSA

### International Normalized Ratio (INR)

After implementing INR alerting, Lakeland received a total of 48 alerts identifying patients that were overdue for their INR. These patients were contacted and to date there are zero patients overdue for INR testing.

### Transitions of Care

The volume of Transitions-of-Care visit types has dramatically increased. The first quarter live, over 300 patients were





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contacted and 180 visits scheduled. As a result high-risk patients can be monitored and proactive treatments and care plans put in place. Patients have communicated that they were grateful to have someone reach out to them.

### Core Measures

Utilizing the functionality within the EHR has also made it possible to create a duplicable system of tools that allows Lakeland to implement a new Core Measure and see results within several months of implementation. Since implementation, CHF, SCIP, and VTE core measures have all seen a downward trend in failures documented.

As continued effort is put into optimization, standardization and the development of additional clinical decision support tools, the value derived and quality of care offered to patients is expected to increase.

### Lessons Learned

During the assembly of our RaDAR team it was quickly identified that organizational buy-in would be critical in order to effectively identify and track key performance indicators (KPI) and then move the needle toward realizing the benefits of an EHR as soon as possible. A partnership structure was put in place consisting of a project team member, an operational partner and an executive sponsor. This structure enabled collaboration between the different levels of the organization and created a clear, shared vision for each KPI. In addition to this collaborative, KPIs are also reported quarterly to executive leadership and the Board of Directors promoting accountability and transparency while ensuring we are focusing on the indicators that are most important to the organization.

The implementation and rollout of vital sign acuity (VSA) monitoring was a step in the right direction in allowing our clinical staff to monitor and identify changes in a patient's condition more proactively. While this has produced successful results by alerting staff of a patient's deteriorating condition and even prevented a patient from being discharged prematurely we are looking at expanding this monitoring to a Modified Early Warning System (MEWS). In addition to respirations, heart rate, blood pressure and oxygen saturation we will begin monitoring conscious level, temperature and hourly urine output with the expectation that staff will be alerted to any potential issues even sooner and intervention can occur more promptly.

Implementing an EHR by itself is not enough to improve clinical outcomes. You must transition to optimization as soon as possible and this phase needs to be accompanied by thoughtful process improvement and standardization of evidence-based care delivery. The patient needs to be at the center of all you do, otherwise, we may implement enhancements that may make it easier for the users and providers, but detrimental to patient care.

In implementing barcode medication administration, we went against our EHR vendor recommendation and implemented wireless scanners. The wireless scanners were selected through a rigorous process. We held demos and "hands on" feedback sessions with the nurses who would be using the product. Based on the feedback we selected wireless scanners but they

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were not readily adopted by end users. It seems that the design of our feedback session must have been flawed. The experience in a conference room trying the device did not translate to how easy the device was to use at the bedside. In the end wireless scanners were replaced by wired (tethered scanners).

Lakeland learned the hard way that inherent risk areas such as order management and medication administration become significant risks in a go-live situation. Mismanagement of a patient's orders as well as a breakdown in communication resulted in a patient not receiving a necessary antibiotic treatment. This ended in the loss of our patient's life. As a result of this tragedy, we worked with our vendor to plan for the worst case scenario with monitoring tools and processes. These tools that we collaborated to develop include searches that our EHR technical support run after go-lives to monitor high-risk areas for potentially problematic use patterns, like overdue admins or a high number of pended orders. The search results are analyzed to identify areas during go-live that may require additional floor support, attention from super users, or training refreshers. These tools are now standard tools offered to all customers of our EHR vendor. Our transparency and willingness to share our experience was a significant contribution to the implementation of the Safety Council by our vendor.

Listen to your vendor, but know when to challenge them. They have a lot of experience implementing their product in a number of different health care environments. The conflict arises from what they know about the product and what you know about your organization. Bring to the surface areas where the vendor is going to fall short or where the vendor does not understand your culture. Approach the vendor relationship as a partnership. Build trust and loyalty to your organization. The more you can get the vendor to work for you the better.

### Financial Considerations

Lakeland HealthCare originally budgeted approximately \$60 million in capital and operational costs from fiscal year 2011 through fiscal year 2015. Through fiscal year 2013, only \$37 million of that projected budget had been spent. While we continue to spend towards our \$60 million budget in fiscal years 2014 and 2015, specifically to complete our Homecare and Oncology implementations, we expect that total spend will be under budget for the entire project. We attribute this savings compared to budget to our commitment to hiring internal staff to implement and support the EHR and to our "speed to value" approach to the Epic EHR implementation. Creating aggressive timelines with a fast big bang approach allowed us to more quickly move from the implementation to the optimization phase, which subsequently results in a faster benefit realization to the large investment inherent in EHR implementation.

We have been able to realize savings attributed both to KPIs measured, Meaningful Use incentive payments, and Epic Good Install and Good Maintenance rebates.