FUSION

CONGESTIVE HEART FAILURE

HEALTHCARE CUSTOMER USE CASE

Improving Patient Care Through Analytics

CONGESTIVE HEART FAILURE (CHF)

With the rapid growth and use of advanced electronic health record (EHR) systems, this has produced an abundance of data previously unavailable for analysis. Currently many health organizations have reporting systems for operational key performance indicators (KPIs) and regulatory metrics and data warehouse systems for analytics. However, using this increasing information as meaningful knowledge to increase quality of care remains a challenge.

This use case focuses on how Fusion Consulting built and implemented an EHR data warehouse solution and extended it to become a true enterprise data warehouse for an Academic University Health System, to address and improve patient outcomes related to clinical programs such as Congestive Heart Failure.

Congestive heart failure occurs when the heart function is unable to provide sufficient blood flow to the body. CHF hospital visits incur 4.4% mortality and 60% readmission rate. 5.1 million people in the United States have heart failure and about half die within five years of diagnosis.

Our goal was to utilize analytics to actually affect patient quality of care and clinical outcomes. We wanted to enable the business and clinicians to access appropriate information at appropriate times resulting in reductions in CHF mortality, length of stay, and administration improvements to timely measurements and follow-up appointments.
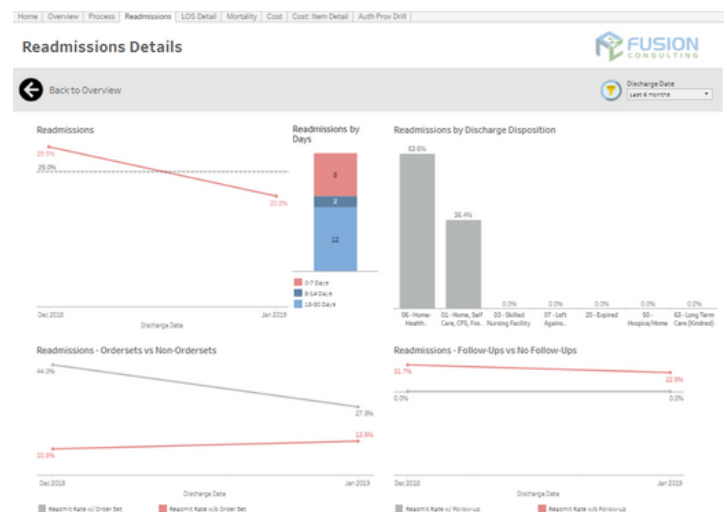
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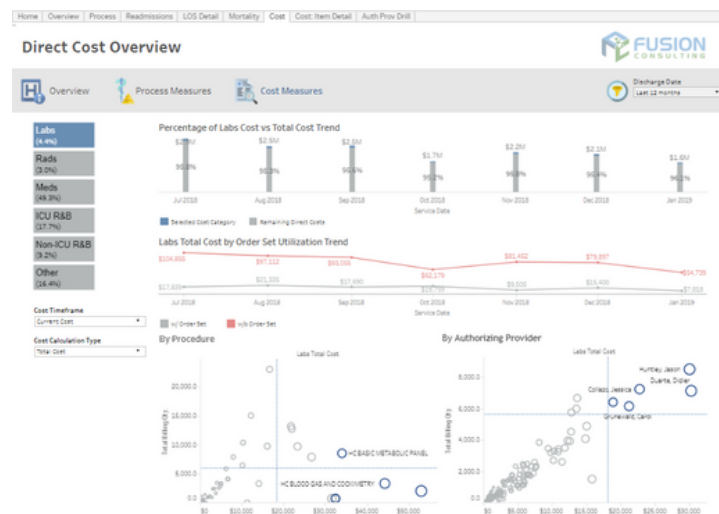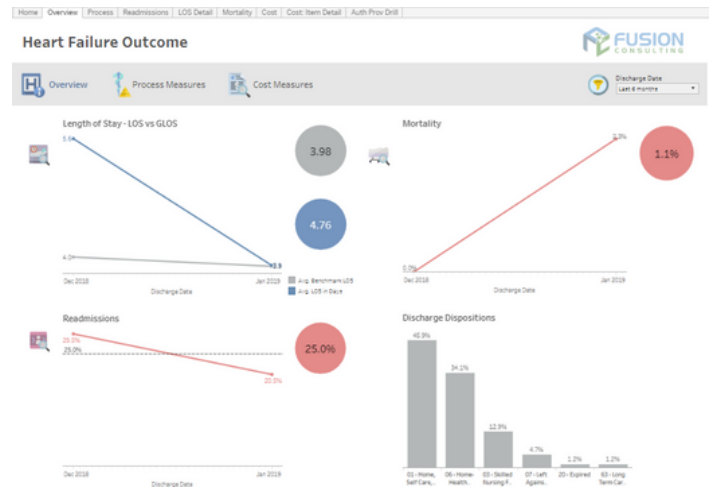HEALTHCARE

AFFECTED JOB CAPACITIES

- Chief Medical Officer (CMO)
- Chief Nursing Officer
- VP of Patient Care
- Director of Clinical Quality
- Inpatient Clinical Services Director

USE CASE EXAMPLE

Our client maintains all medical records using their EHR system. We successfully implemented the EHR's data warehouse solution and extended it to become a true enterprise data warehouse including detailed clinical and operational information for each hospital visit.

We created KPIs and business intelligence tools to analyze clinical outcomes and defined those clinical outcomes as length of stay, readmissions, and mortality. The goal is to reduce each of these measures. We analyzed these outcomes by diagnosis and diagnosis-related group (DRG). We compared the results with benchmarks of averages from other hospitals and targets established by the Center for Medicaid and Medicare Services (CMS). We used this analysis to identify clinical areas with the greatest opportunity for improvement.

Next steps were to build work groups where quality clinicians worked with the business intelligence team to develop analytics for each targeted clinical program. Clinical programs identify a specific patient population based on acute or chronic diagnoses, physical hospital location, and performed hospital procedures. Each clinical program has applicable clinical KPI's to track. Congestive Heart Failure was one of the dozen clinical programs developed thus far. These same work groups and clinicians were involved from beginning to end of the project to perform user acceptance testing and to enable rollout to the hospital users.

Fusion utilized their expertise by implementing our client's EHR enterprise data warehouse and business intelligence tools to analyze and improve clinical outcomes for patients.

We developed work groups where quality clinicians worked with the business intelligence team to develop analytics for each targeted clinical program. Clinical programs identify a specific patient population based on acute or chronic diagnoses, physical hospital location, and performed hospital procedures.

CHF was one of the targeted programs that had applicable clinical KPI's to track. To enable our short-term lessons learned analytics we created were custom Tableau dashboards for each clinical program and included the data points specific to that clinical program such as CHF, but also included our clinical outcomes including length of stay, mortality, readmission and critical care length of stay in each dashboard.

RESULTS

One of our most important success criteria is user adoption. While we started with a pilot of five users, we now have 147 active users. Our dashboards have been viewed 31,027 times and are used regularly in clinical and operational meetings.

Our self-reporting initiative has had significant early success. Users have created their own reports and developed programs not mentioned here, including critical care daily goals. These were developed not by the IT analytics team but by the business users and quality department.

We have evaluated progress of the analytics in improving clinician behavior and patient outcomes. Over a period of time, we have observed the following results vs patient encounters prior to the analytics rollout: *(see next page)*

- Reduction in mortality
- 1.5-day reduction in length of stay
- 57% of eligible patients received recommended CHF order sets
- 2-hour reduction in time from door to diuretic
- 56-minute reduction in median BNP turnaround time
- 73% increase in daily weight documentation
- 22% increase in follow-up appointments

REUSE OPPORTUNITY OF USE CASES

CHF analytics can be reused in all inpatient hospital settings. CHF is a common chronic medical condition that is associated with complications and high mortality rates. Improving the quality of timely medical interventions associated with CHF exacerbation can improve patient outcomes. This CHF analytic clinical program will provide the necessary data elements clinically recommended to treat CHF exacerbation. The program tracks the times of which medical interventions are performed. This data will help to identify potential barriers and trends in treatment plans once CHF exacerbation treatment begins. The improvement of CHF exacerbation treatment workflows impacts notable hospital KPI's such as length of stay, readmissions, and mortality rates.

HAVE QUESTIONS? WANT TO DISCUSS YOUR CURRENT PROJECTS...
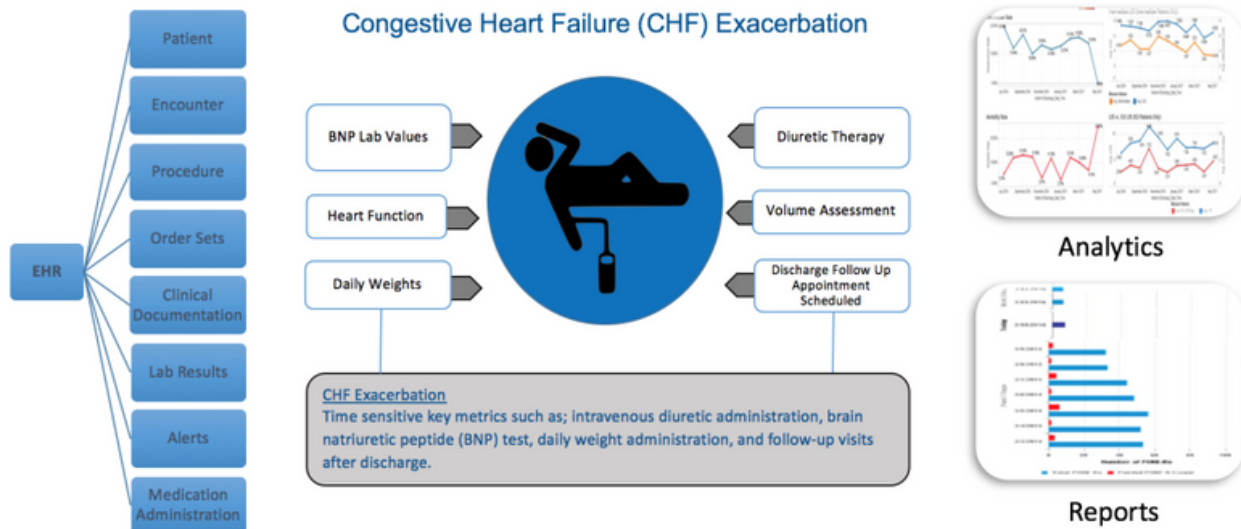
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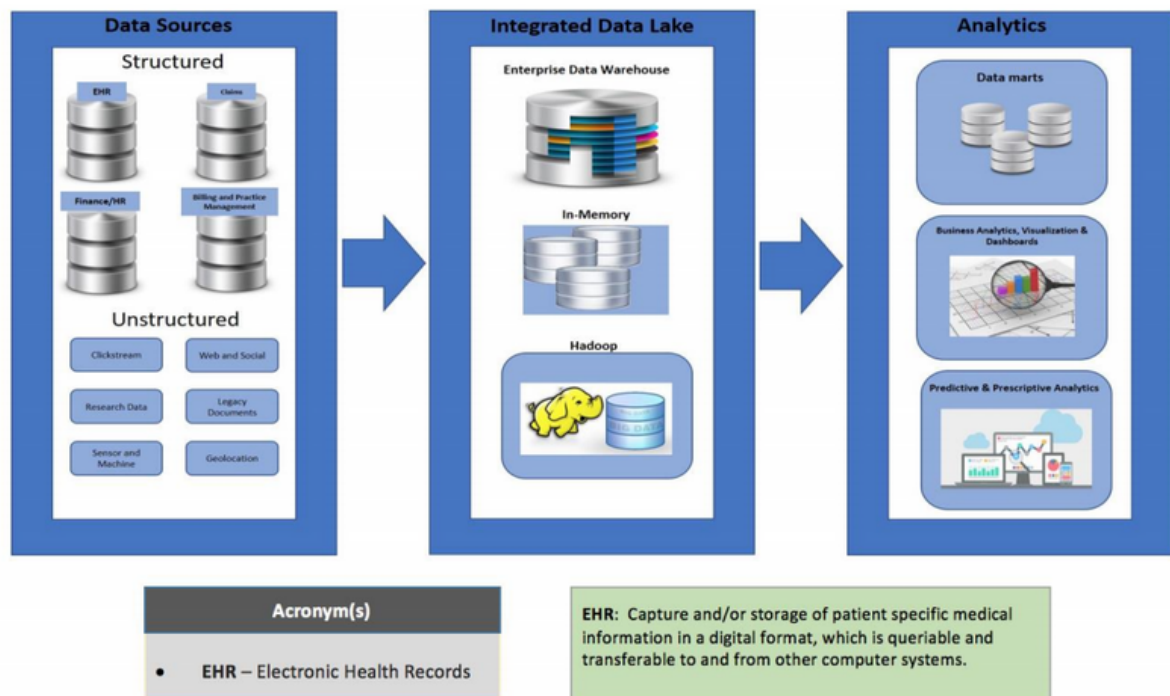
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Our Healthcare
SOLUTIONS

Fusion's solutions help healthcare customers unlock data, from their EHRs and other data sources, to provide a vendor agnostic approach to achieving clinical outcomes. As part of this approach, Fusion provides a measurable ROI to help evaluate key areas for improvement and a framework to align clinical quality, efficiency, utilization, productivity and financial objectives.

USE CASE FLOW DIAGRAM

TECHNOLOGY ARCHITECTURE

REFERENCES

"Improving Patient Care Through Analytics" – Paper Publication Conference Paper· September 2016 DOI: 10.1109/ISCBI.2016.7743265 Conference: 2016 4th International Symposium on Computational and Business Intelligence (ISCBI)

https://www.researchgate.net/publication/310500110_Improving_patient_care_throug h_analytics
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