



FUSION



IMPROVE PATIENT & HOSPITAL OUTCOMES WITH ANALYTICS

# ADULT & PEDIATRIC SEPSIS

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HEALTHCARE CUSTOMER USE CASE



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# The Future Of HEALTHCARE

*Improving Patient Care Through Analytics*

## ADULT & PEDIATRIC SEPSIS

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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.

Septic shock occurs when organ injury from infection leads to dangerously low blood pressure and abnormalities in cellular metabolism. Severe sepsis and septic shock have one of the highest rates of hospital mortality, with estimates ranging from 25 to over 50%.

This use case focuses on how Fusion Consulting guided our client to successfully utilize analytics to actually affect patient quality of care and clinical outcomes. Enablement was priority for the business and clinicians to access appropriate information at appropriate times to accurately identify those clinical areas with the greatest opportunity for improvement. We did this in part by developing work groups where quality clinicians worked with the business intelligence team to develop analytics for each targeted clinical program such as Sepsis.

# AFFECTED JOB CAPACITIES

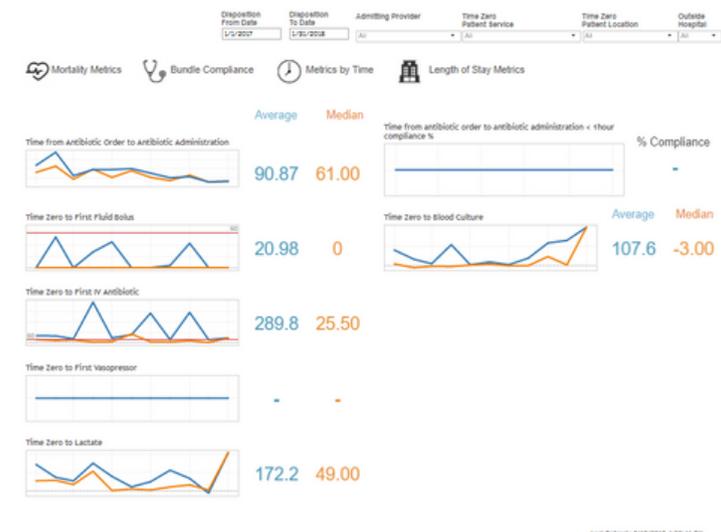
- Chief Medical Officer (CMO)
- Chief Nursing Officer
- VP of Patient Care
- Director of Clinical Quality
- Inpatient Clinical Services Director

# USE CASE EXAMPLE

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. Sepsis was one of the targeted programs that had applicable clinical KPI's to track.

With severe sepsis and septic shock having one of the highest rates of hospital mortality, it was imperative that we identified key metrics for it which are antibiotic administration, lactate collection, blood culture collection, central venous pressure (CVP), and fluid resuscitation. Sepsis treatment is extremely time-sensitive so the most important metric is the number of minutes from arrival and/or instances of an EHR decision support alert to these clinical events. Additionally, fluid resuscitation requires a specific amount of fluid administration per kg of the patient's weight.

To enable our short-term lessons learned analytics we created were custom Tableau [19] dashboards for each clinical program and included the data points specific to that clinical program such as Sepsis, but also included our clinical outcomes including length of stay, mortality, readmission and critical care length of stay in each dashboard.



## RESULTS

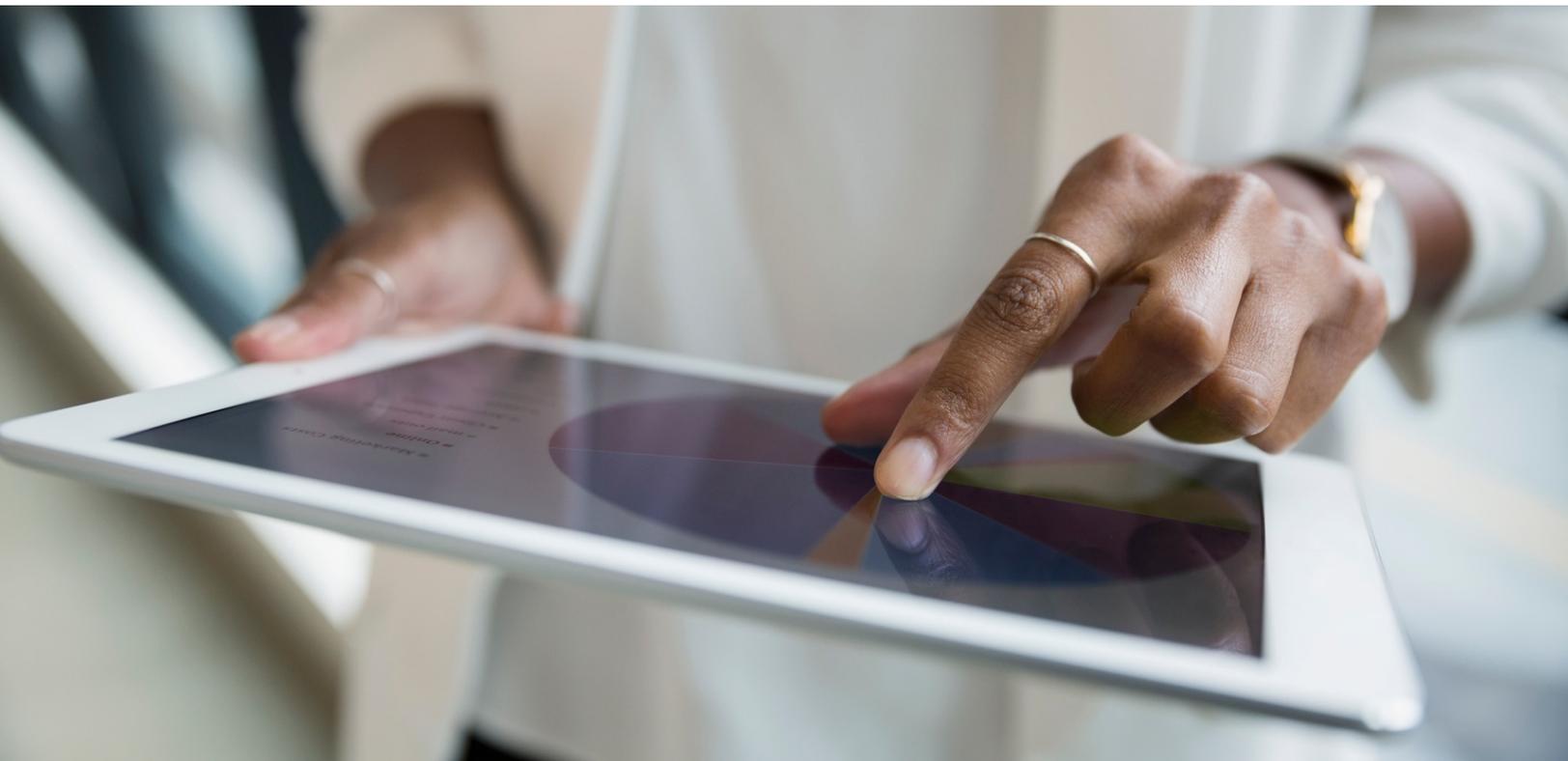
We have evaluated early progress of the analytics in improving clinician behavior and patient outcomes. In the last 7 months, we have observed the following results vs patient encounters prior to the analytics rollout:



- 27% reduction in mortality rate
- 25% reduction in readmissions
- 16-hour reduction in critical care length of stay
- 14.6% improvement in antibiotic administration in first 3 hours
- 14.8% improvement in timely lactate measurement
- Reduction in average time to each important clinical action

## REUSE OPPORTUNITY OF USE CASE

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  
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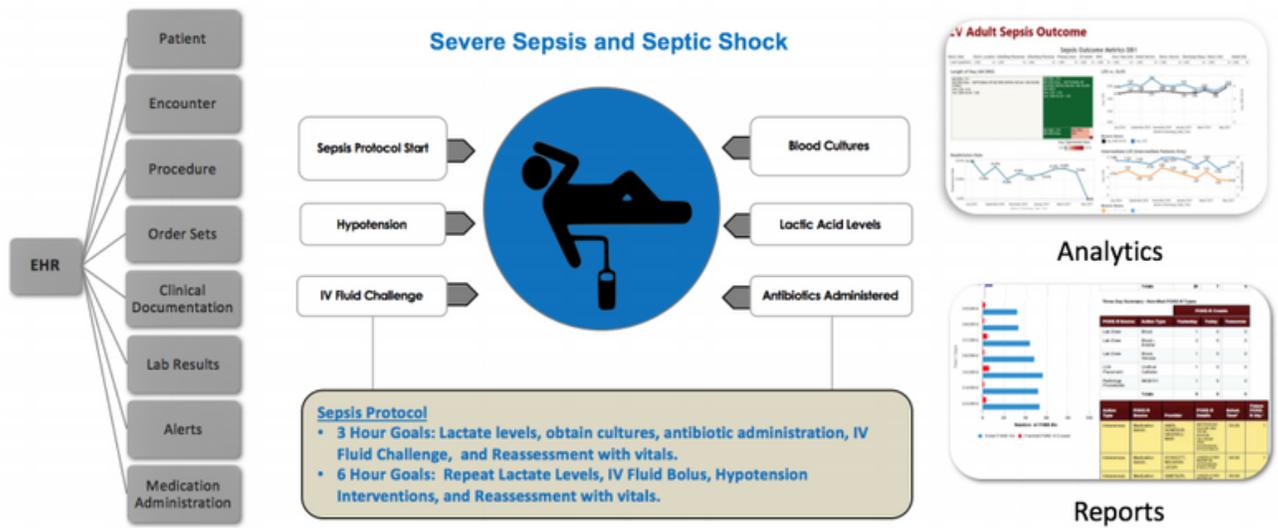
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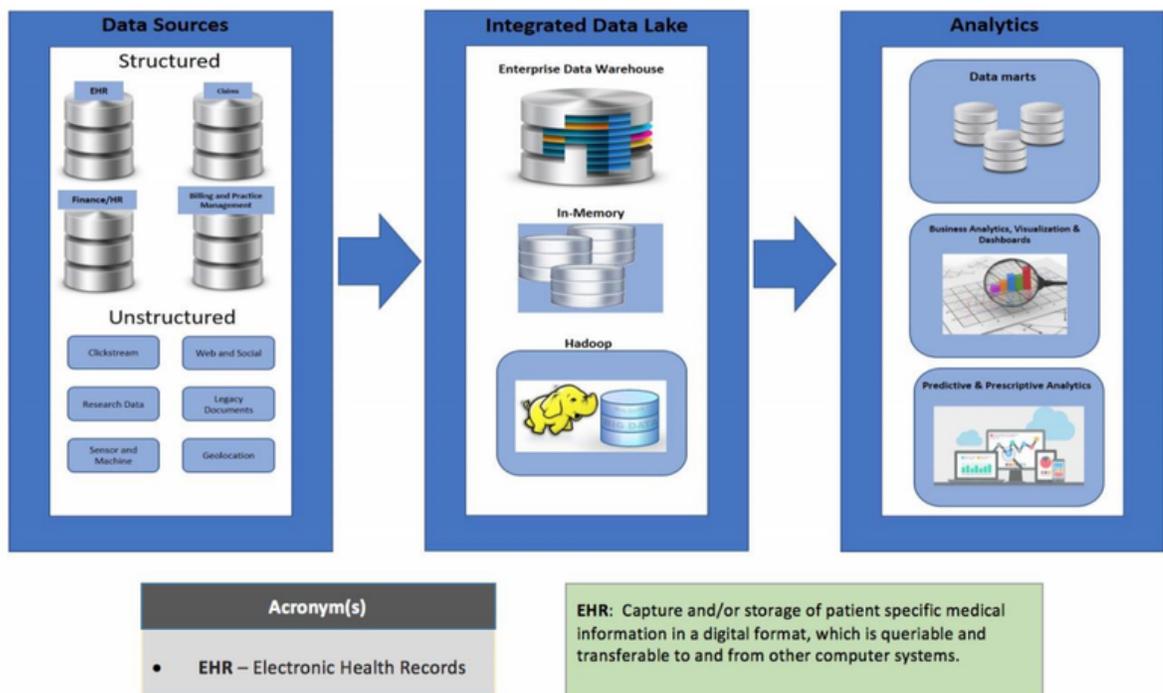
# Our Healthcare SOLUTIONS

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\\_through\\_h\\_analytics](https://www.researchgate.net/publication/310500110_Improving_patient_care_through_h_analytics)  
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