Healthcare Re - Imagineering

How disruptive technology will help to transform healthcare

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Agenda

- Brief Introduction
- Why data is essential to healthcare delivery transformation
- What can be done to make the best use of your data – ED throughput example
- The power of machine learning
  - Present
  - Near Future

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Jellyfish Health/Pivot Point Consulting Combined Experience

Highly experienced management team (over 200 years of experience)

- History of success
- Focused solely on healthcare

Technical Expertise

- Data Integration
- Machine Learning
- Think outside the box

Process Change Expertise

- Driving change from a data driven perspective
- We've seen the data, how do we effect change?

Healthcare's Problem

Where We Are…

- How to enhance revenue through complementary service lines
- Little to no ability & agility to shift from fee for service to value based care
  - Do you really know costs (not RVU's)
  - What is the risk pool (shallow and deep end)
  - Time, people, & money shortage to invest in new platforms
- Lack continuous & sustainable process improvement
- Searching for population definition & ownership
- Global Capitation – what, how & when to get there

Cost containment/holdback – ability to understand, track measure, and manage the operational detail associated with changes in reimbursement models

What If You're Not Learning From Your Data?

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Show Me The Power

- Value requires focus on making current assets and resources (materials, equipment, facilities, Staff) work more effectively.
- Successful organizations are striving to become lean – focused and efficient; doing more with assets they already have.
- Data is one of the most valuable assets they have, yet often underutilized and misclassified as a liability.
- Data in healthcare is a powerful asset to be unlocked and used!
- The democratization of data access allows organizations to become much more data oriented in decision making.
  - data-based decisions lead to greater effi process improvement.

What could a Solution look like?

Why combine Disruptive Technology with Process Improvement?

- Access to comprehensive data in an actionable format is essential to survive in a pay for performance model.
- Based on past experience (EMR implementations), disruptive technology implementations require focus on process improvement.

"Those who fail to learn from history are doomed to repeat it." Sir Winston Churchill

Analytics Process Flow

EMR/EHR Data
- Health record
- Rx
- Cost

IDN Data
- Health record
- Rx
- Cost

Rx Utilization

Analytics

Cohorts by
- Clinical data
- Behavior Health
- Substance abuse

Automated cluster analysis

Aggregation of costs from each population cohort

- Cohort Cost Analysis
- Machine Learning = outcome performance drivers

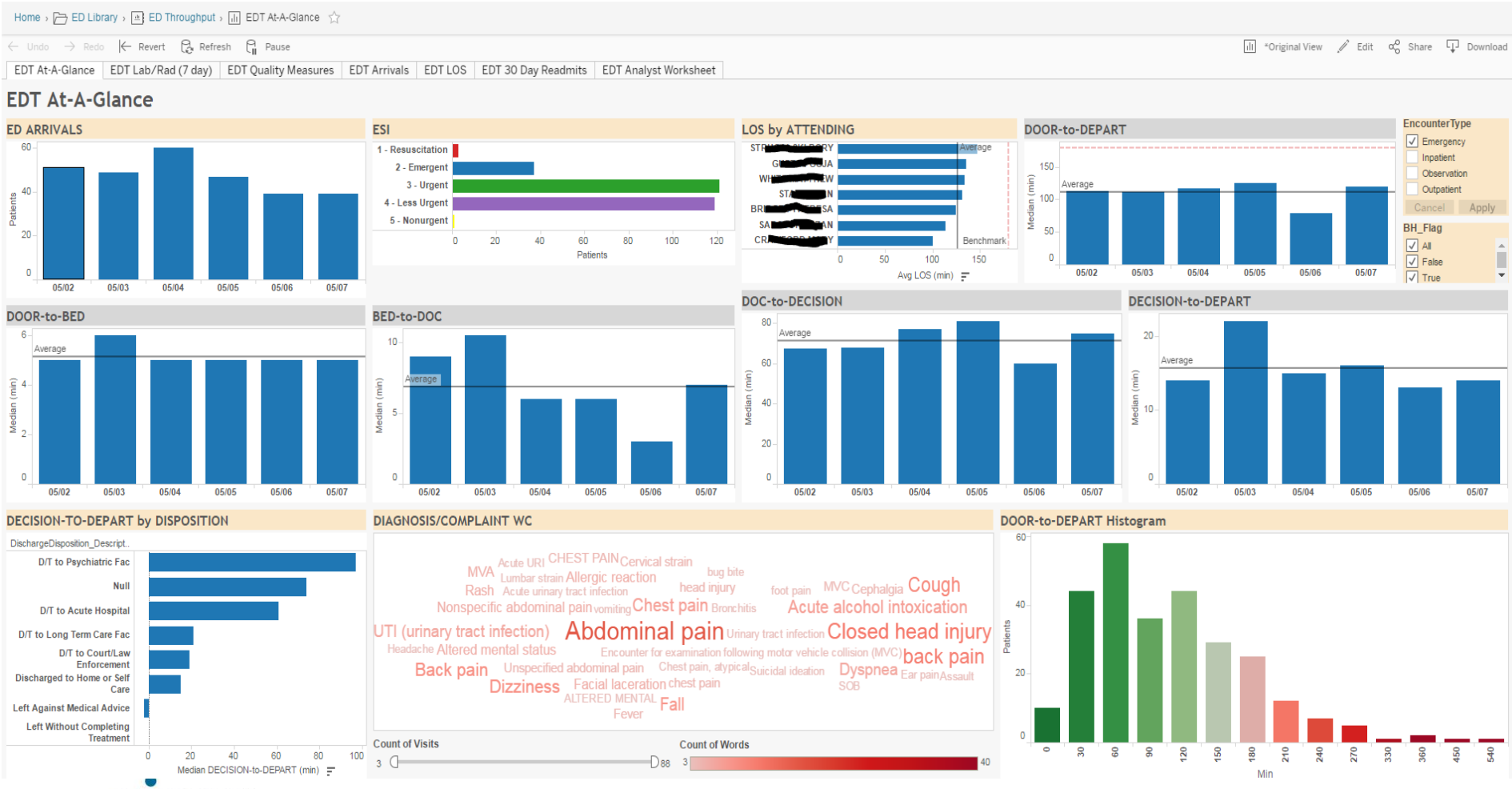
- Cohort Identification
- Cohort Cost Computation
- Intervention Prioritization
- Actionable Outcome Performance Factor Identification & Notification

Subscription-based:
- Outcome Outlier Status
- Poor Outcome Prediction Notifications

Process Metrics & Actionable Outliers

+ Messaging*

Focus on Drivers of Key Metrics – ED Throughput Example



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ED Throughput Example

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ED Throughput – Lab and Rad

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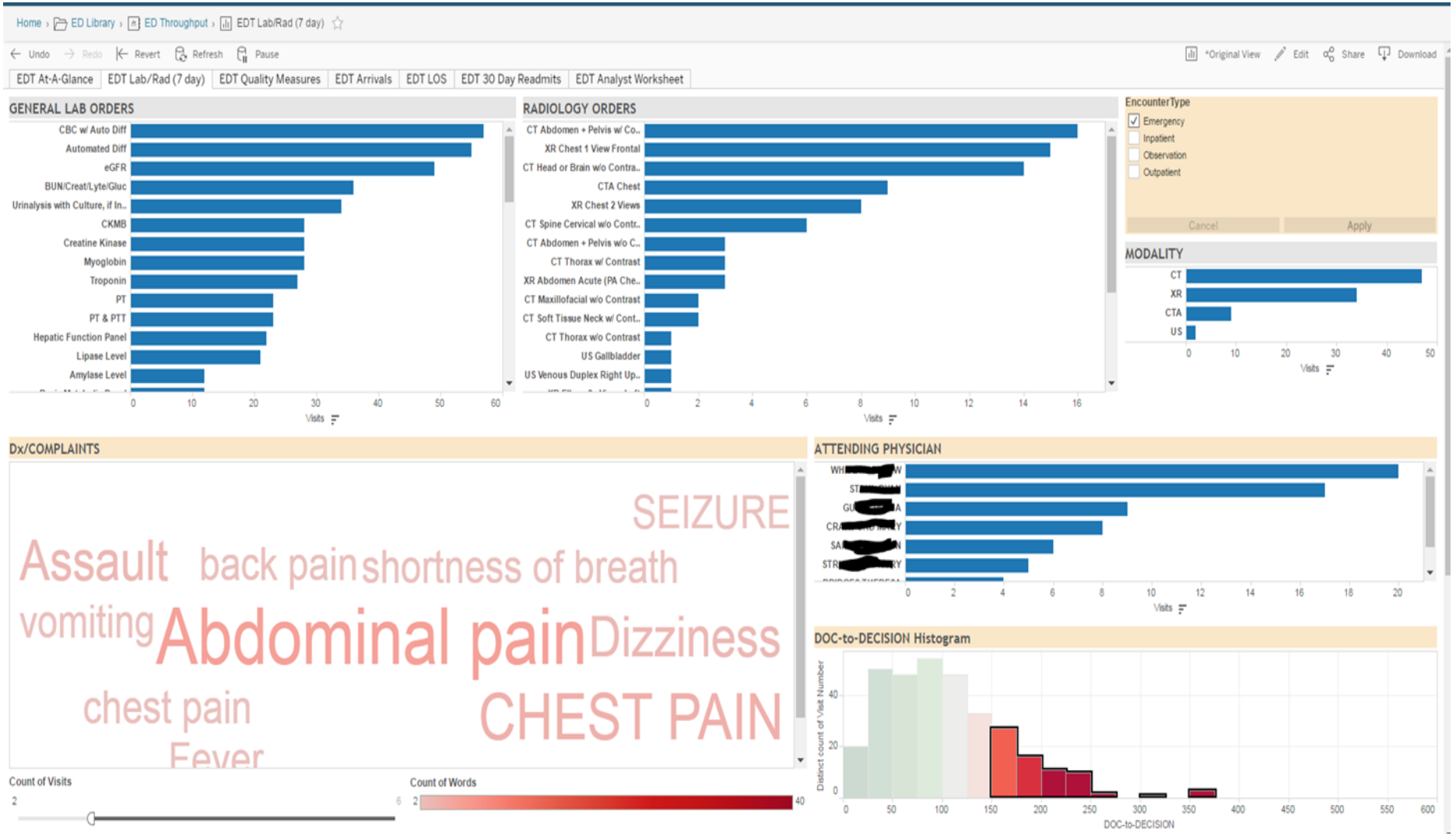
ED Throughput – Lab and Rad



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Door/Decision to Depart

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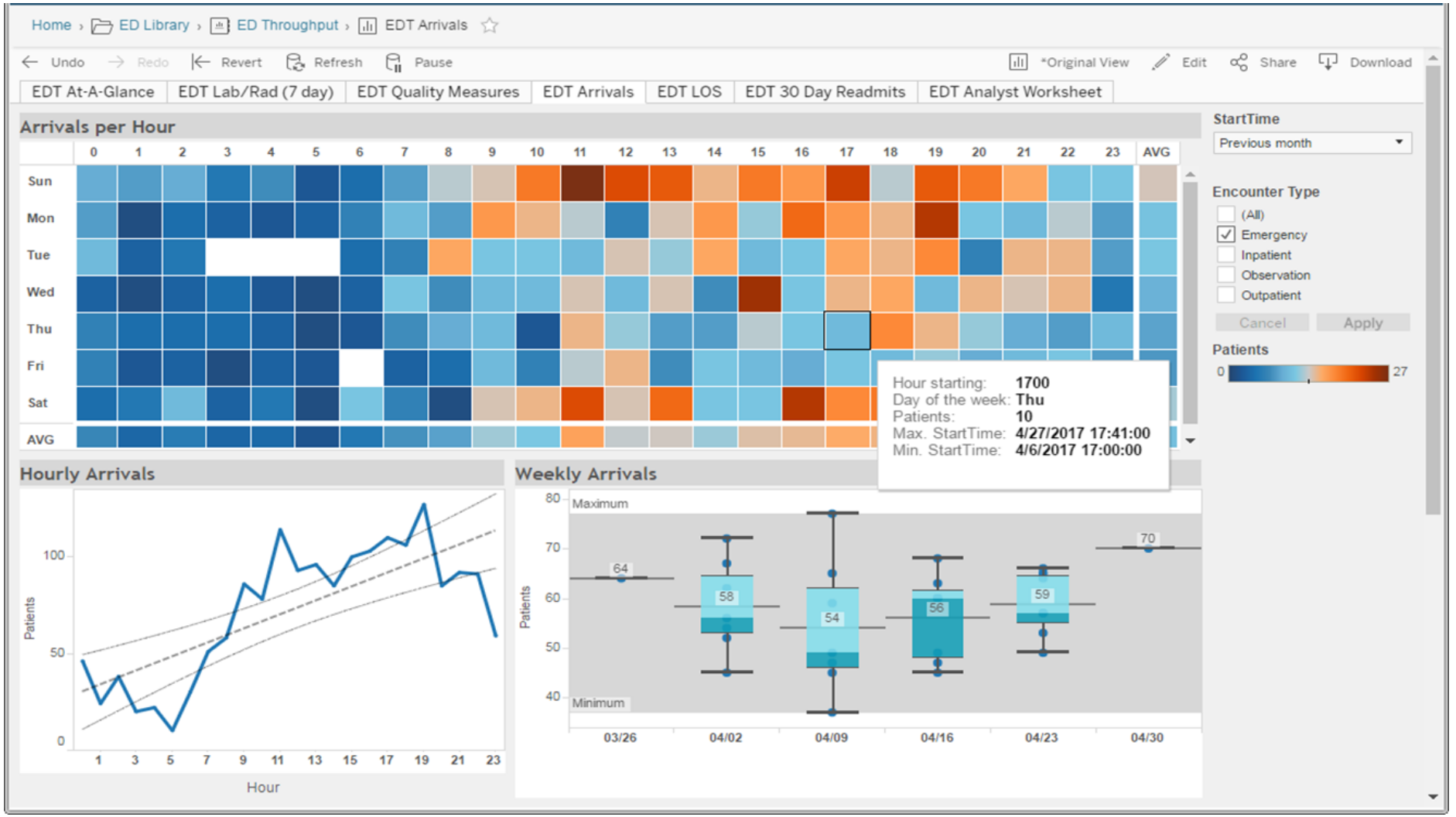
ED Arrivals Summary



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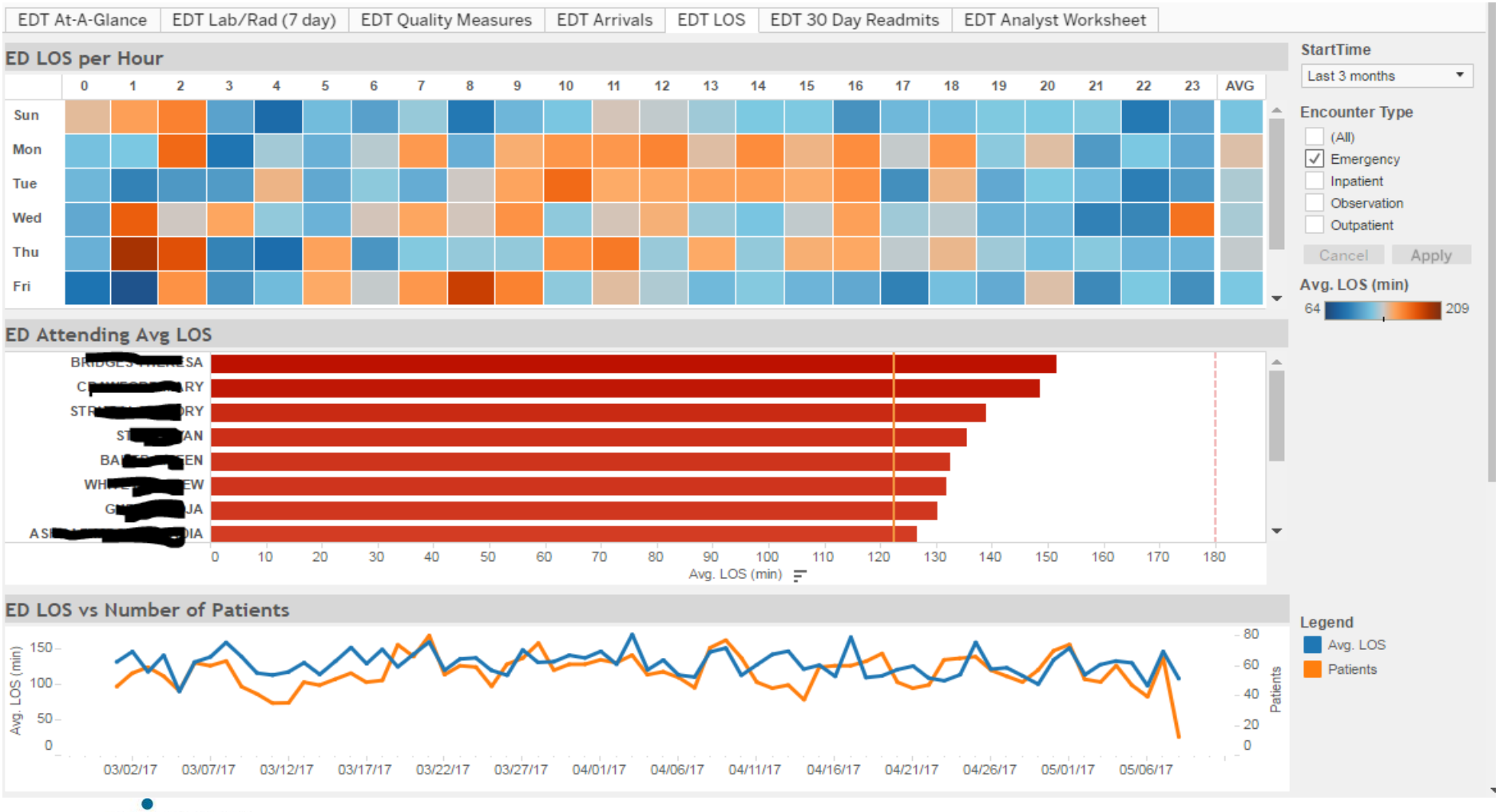
ED LOS Patterns and Summary Information



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30 Day Re-visits to the ED

EDT At-A-Glance | EDT Lab/Rad (7 day) | EDT Quality Measures | EDT Arrivals | EDT LOS | EDT 30 Day Readmits | Demo EDT 30 Day Readmits | EDT Analyst Worksheet | WordCloud

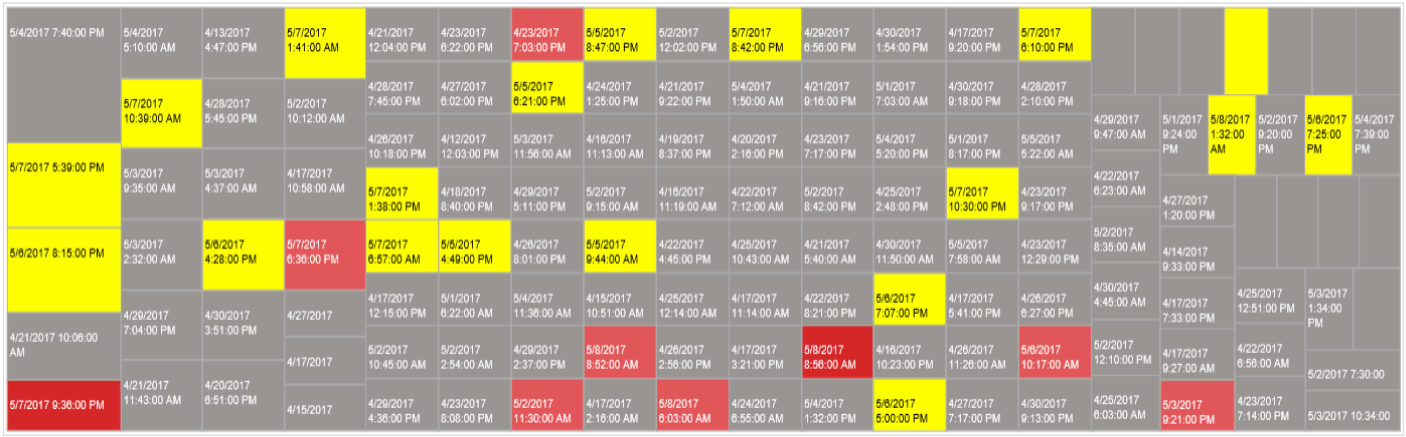
Word Cloud 30 Day Readmits

Count of AdmitReason Description

2 — 13

Demo Visits per Patient

Select patients to view admitting reasons.



Encounter Type

- (All)
- ☑ Emergency
- ☑ Inpatient
- ☑ Observation
- Outpatient

Cancel | Apply

Admission Source

(All)

Visit Count

2 — 8

Plan Type

(All)

Insurer Description

(All)

Status

- Current Patient 2 in 30
- Current Patient 2 in 72
- Discharged
- Discharged t-72

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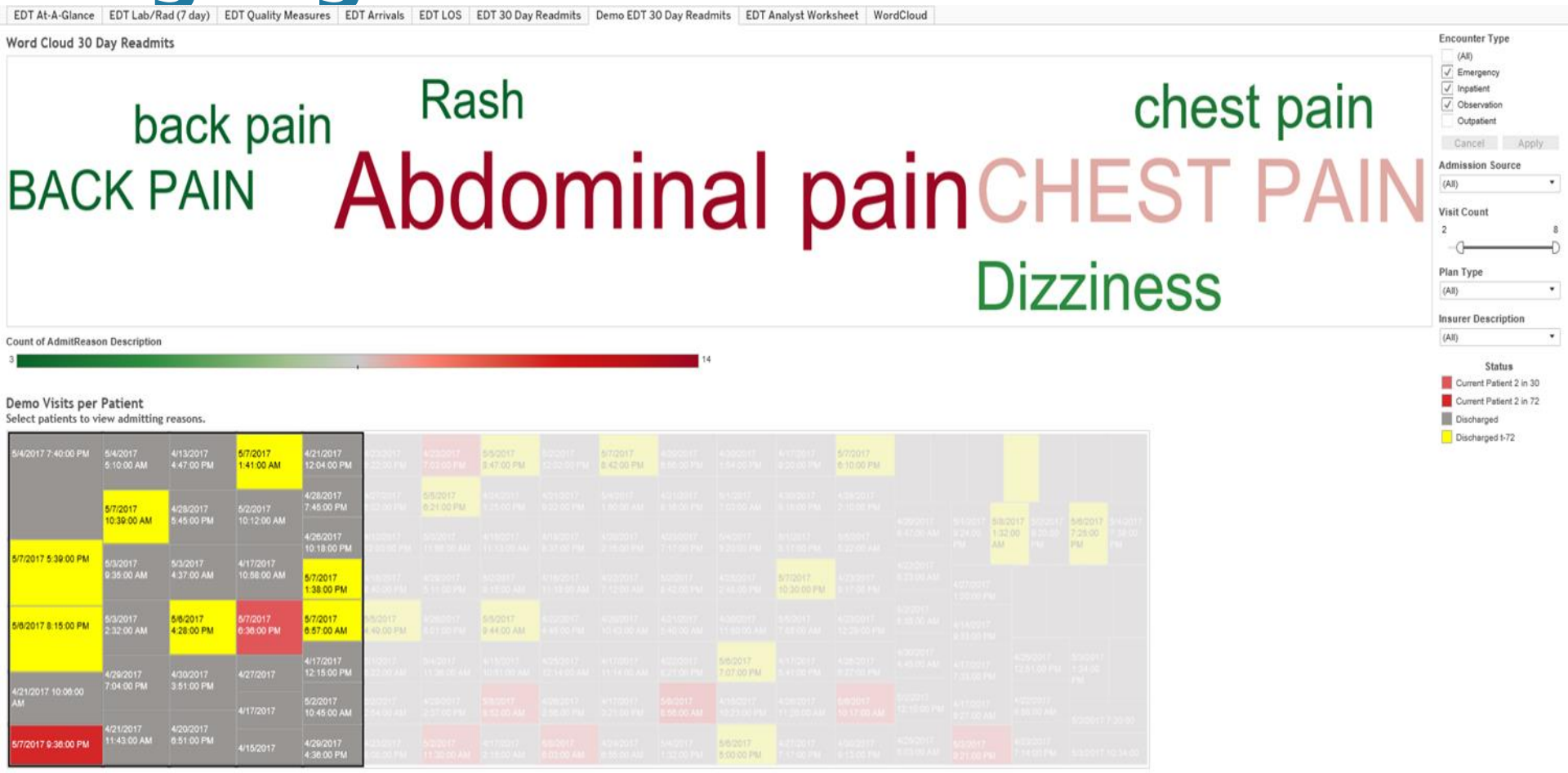
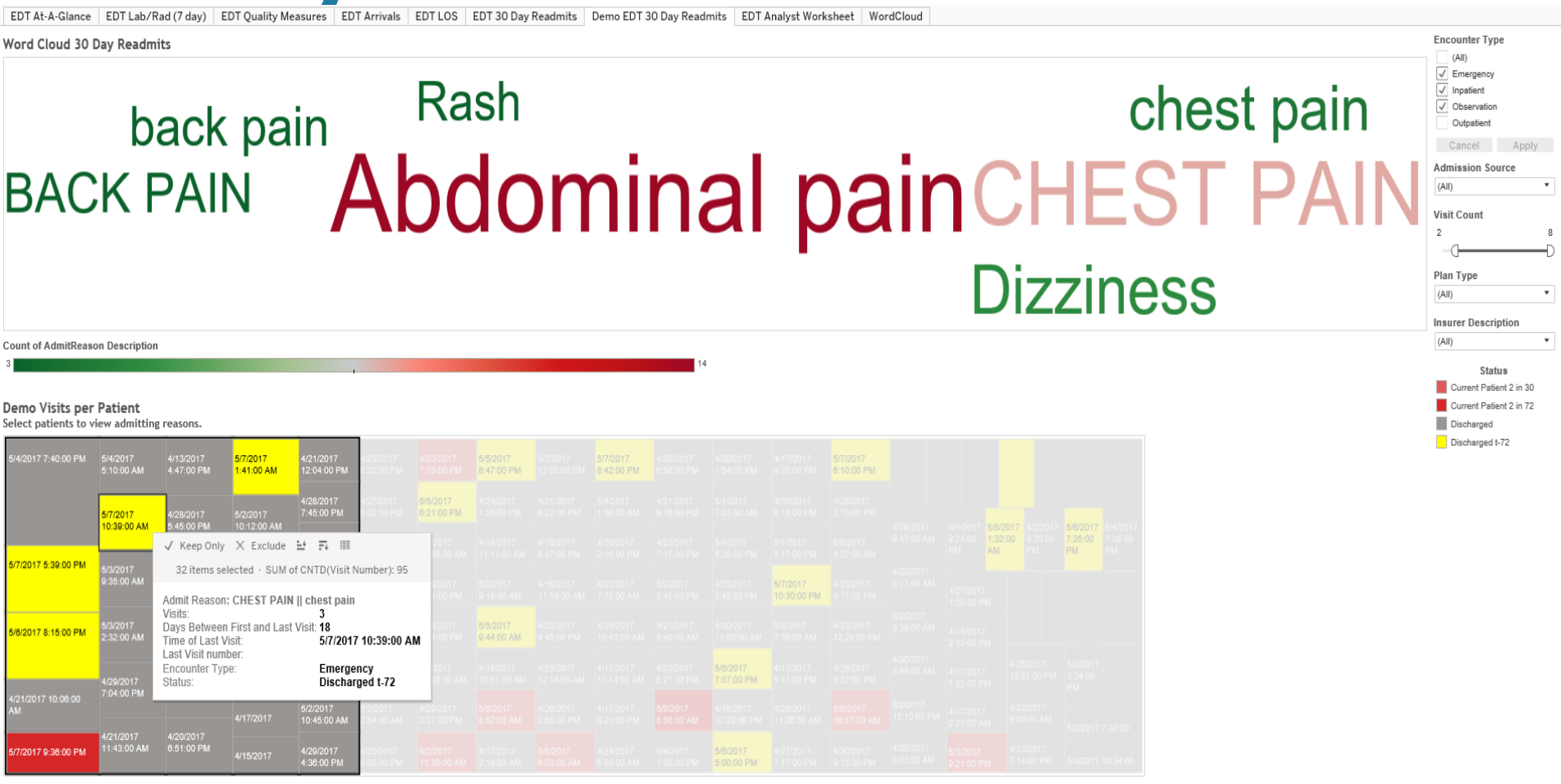
Frequent Flyer Complaints are Highlighted



Two Visits for Chest Pain within 30 Days



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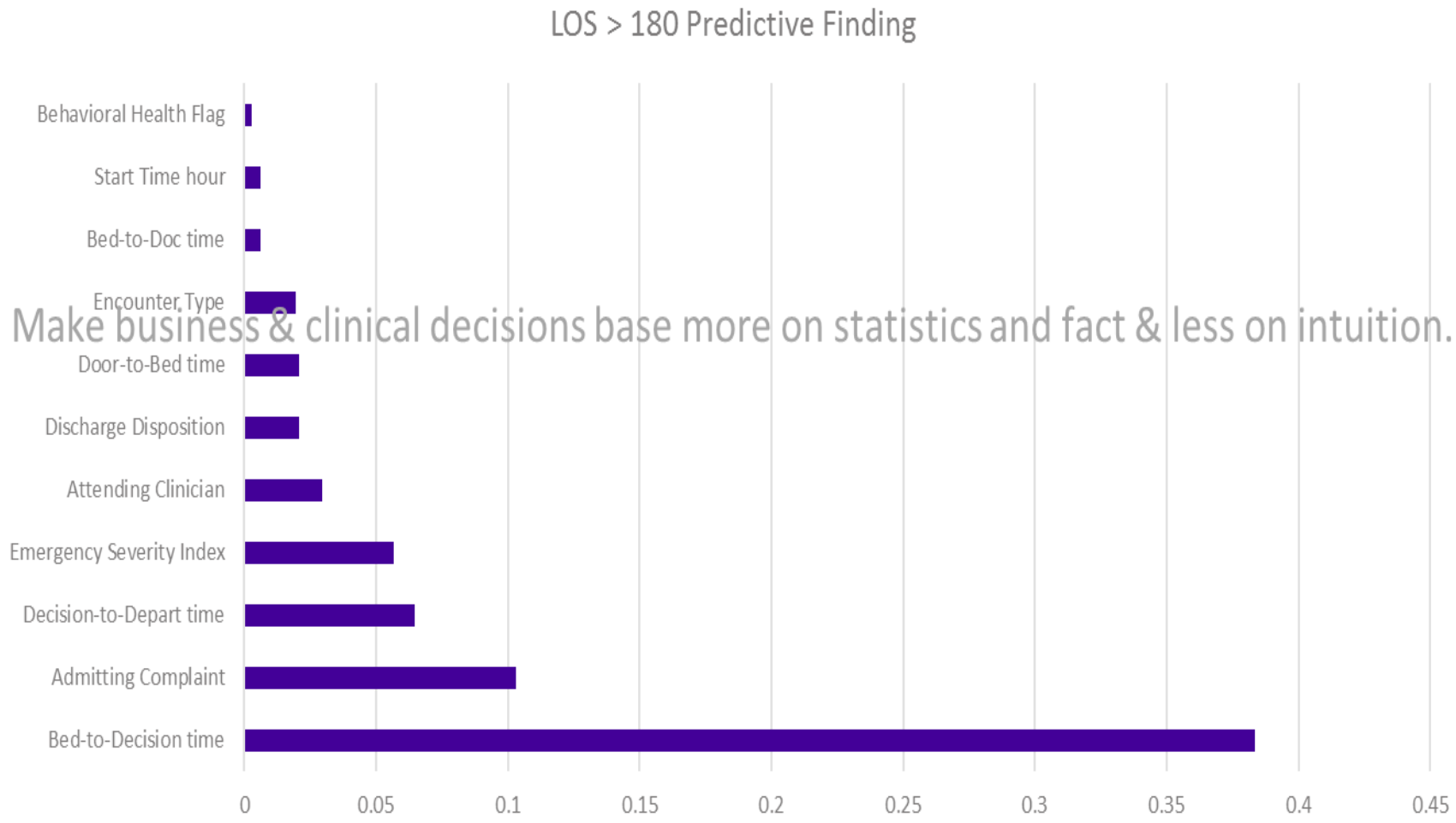
What did the Data say?



Make business & clinical decisions base more on statistics and fact & less on intuition.

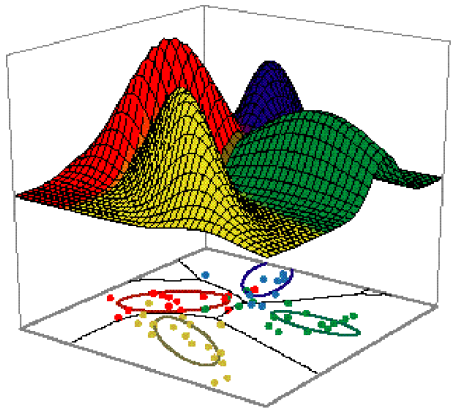
Why is Machine Learning important to you?

- **What is Machine Learning?**
  - Machine learning is a type of artificial intelligence (AI)
  - ML is only possible today because of the massive advances in Computational Science and Technology to enable massive scale data processing and comparison
  - The machine will learn without being explicitly programmed. Thus avoiding a biased perspective.
- **What is the value of Machine Learning in Healthcare?**
  - Machine learning uses Pattern Recognition to identify significant factors and anomalies
  - Facilitates procedural change
  - Leverages experiences from other industries
  - Allows for a more patient focused approach to care delivery

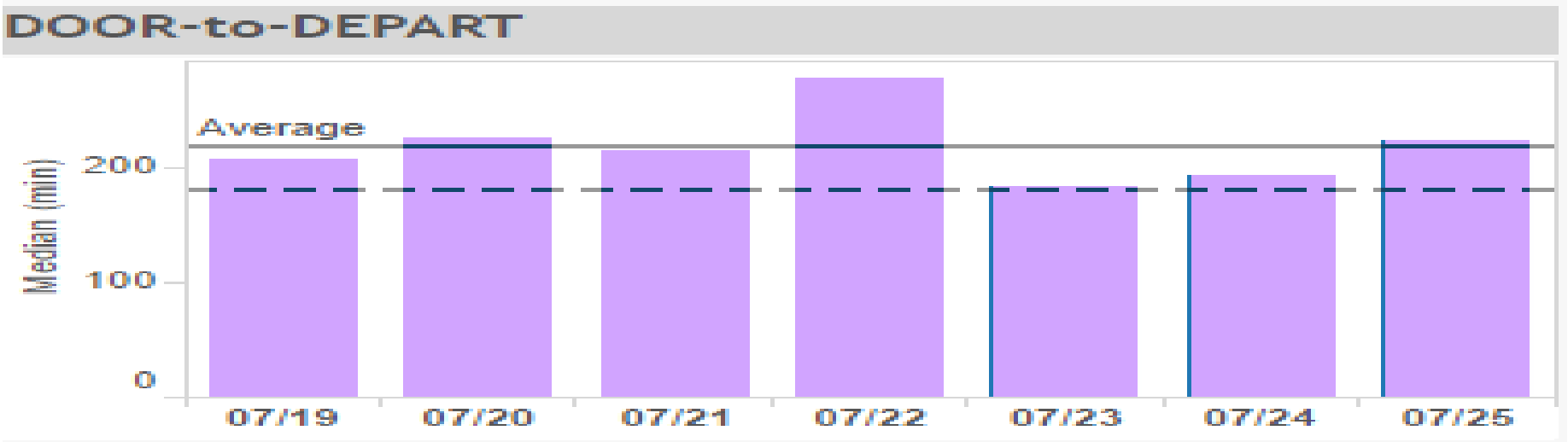
The Future: Machine Learning & Focused Procedural Change

What's the benefit of a learning system?

- If outcomes are dependent on more than a few factors:
  - How do I know which factors are relevant and meaningful?
    - Lowest cost
    - Highest procedural impact
  - Should I work to control outliers through a process improvement program?
  - How effective is this approach?
  - How do you translate data into operational improvement?
  - What happens to the result if variables change such as staff, diagnosis profile, resources, etc.?
- Is there a way to know, in real-time, when a poor outcome is likely in order to affect change?



A Platform for Adaptive Prescriptive Analytics



Current Visits Likely to Exceed 180 mins

Encounter#	Location	Elapsed Time	ED Attending
1043211	2103-2	110	R. Schmidt
1043207	2101-1	129	B. Singer
1043302	2303-1	134	S. Sagitta
1043410	2310-2	128	G. Falcone

A Platform for Adaptive Prescriptive Analytics

Focus Areas				
Encounter # w Current ED LOS	Projected Time in the ED	Focus Areas	Component Findings	Active Notifications
1043211 110 Minutes	198	Lab	Labs ordered are pending results	On
		Radiology	Images are pending for Radiology review	Off
		Psych Consult	No response to Psych order	Off
1043208 129 Minutes	208	Radiology	Images are waiting for Radiologist	On
		Orthopedics	Ortho has not responding to consult request	On
1043302 134 Minutes	215	Discharge Plan	Waiting for Long Term Care Facility	Off
1043410 128 Minutes	223	Cardiology	Waiting for Cardiac Study Results	Off
		MD Orders	Waiting for Physician Orders	On

There Is A Better Way…

- Modern platform & services - think Amazon
- Know and understand your business & population in real-time
- Reduce time to act
- Understand what data has value in driving change or improved outcomes
- Actionable Findings - Tactical & Strategic
- Manage the reimbursement transition through sustainable optimization of service lines, departments, organization – outcomes!

"Skate to where the puck is going not to where it used to be" Wayne Gretzky

- Move away from hospital centric care to Patient Centric care

- Move toward decentralization disruptive innovation
  - Solutions aimed at near real time process improvement
  - Technology focused on improving the patient experience