

Thinking Outside The Margins: Data and technology's Role in Empowering Financial Success



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Director, Healthcare  
Analytics



# Learning Objectives

Describe what AI and analytics means in the context of health care?

Identify use cases that can achieve margin improvement.

Explain how to utilize data to identify and achieve ROI opportunities.

Describe how to achieve performance improvement through data-guided process transformation.

# INTRODUCTION



**Jamie McGlothlin**  
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Health Care Analytics National Lead

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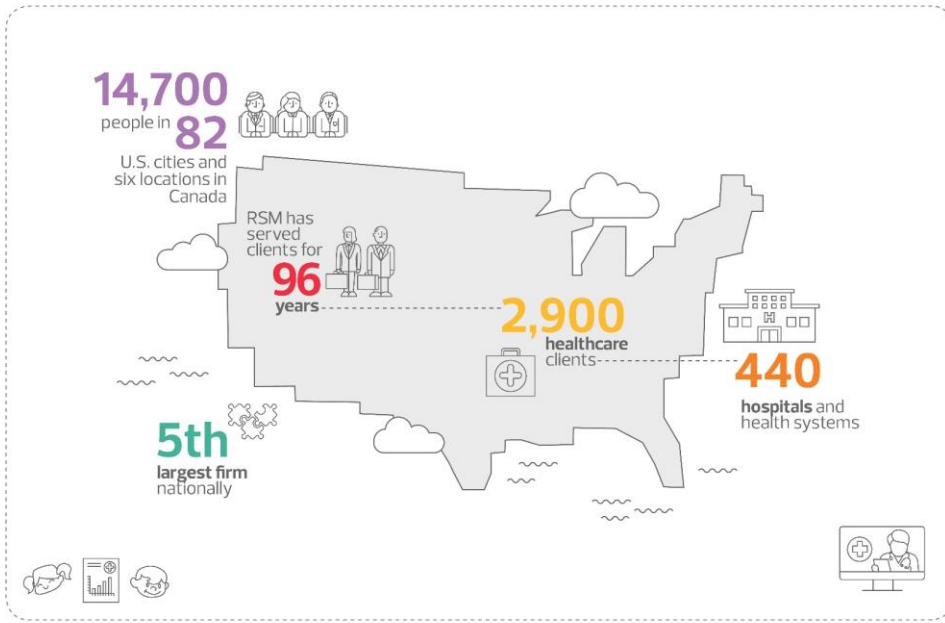
+1 469 995 5171

- PhD in computer science
- 32 years experience, 13 years in health care analytics consulting
- 13 peer-reviewed research publications in leading health care conferences
- Millions of \$ in ROI generated for health care clients

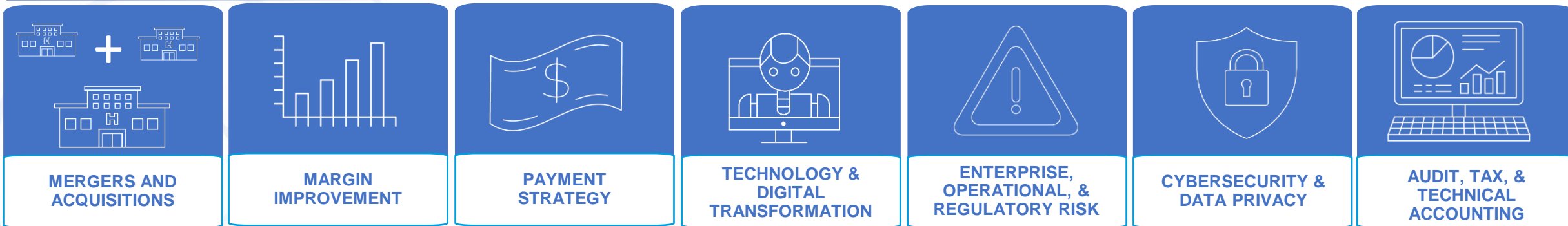


Jamie provides health care analytics for health systems to drive performance improvement in clinical quality, patient safety, operational efficiency and cost reduction.

### DID YOU KNOW?



### OUR HEALTHCARE VERTICALS



# RSM Health Care Data Analytics: Approach

<p><b>Data-driven</b></p> <p>Use data to choose opportunities</p> <p><b>Augment not replace</b></p> <p>Leverage EMR and existing data warehouses and solutions</p> <p><b>No new silos</b></p> <p>Clients have too many tools and too</p>	<p>much data already</p> <p><b>Time to Value</b></p> <p>Short term ROI, Long term sustainability</p> <p>Solutions build on each other</p>
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## MULTI-PHASED AGILE APPROACH

- ✓ Deliver short term return on investment
- ✓ Design data solutions which build a long-term foundation reusable for many analytics



## LEVERAGE & AUGMENT EXISTING SOLUTIONS

- ✓ Utilize your data warehouse and business intelligence tools
- ✓ Leverage your EMR (Epic, Cerner, Meditech)



## INTEGRATE SOURCES & ELIMINATE SILOS

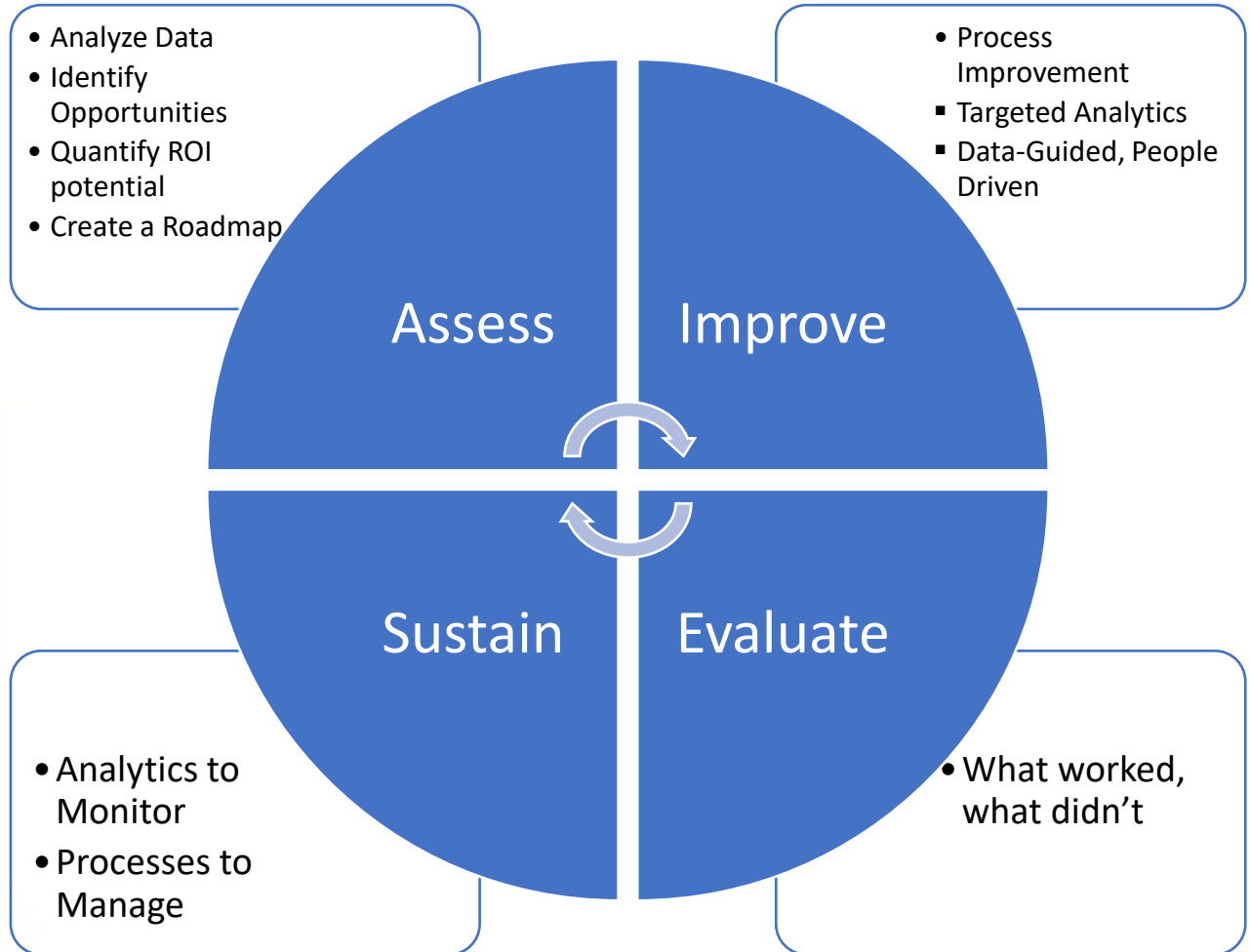
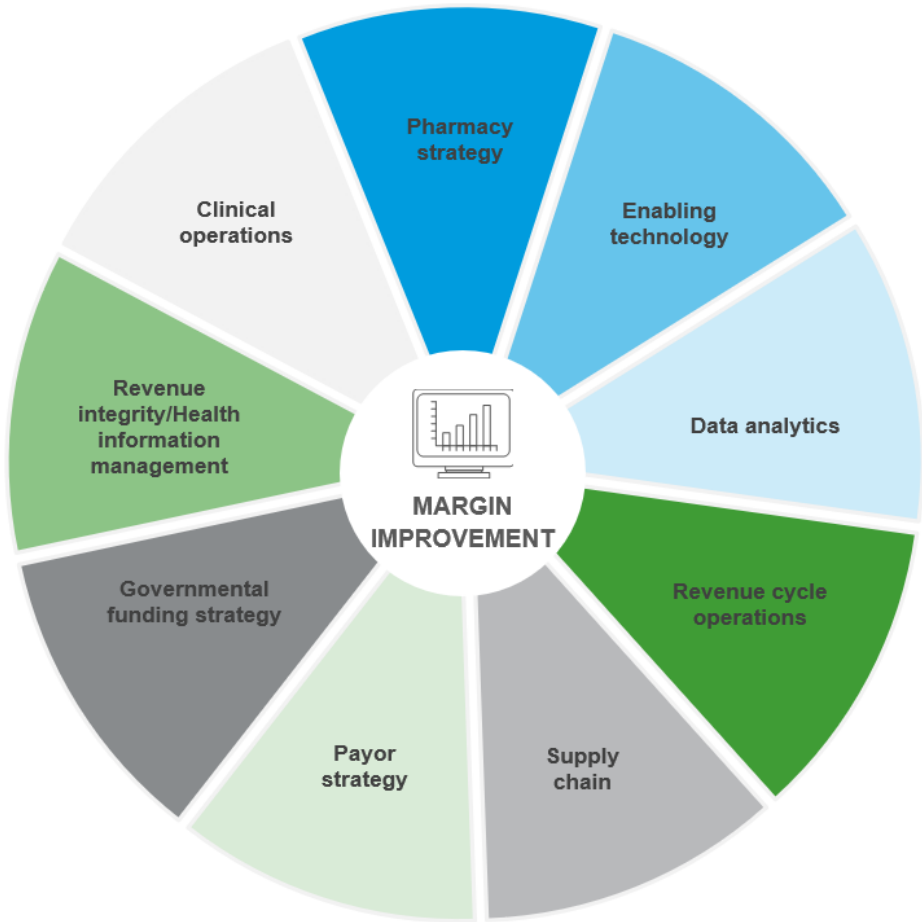
- ✓ Join EMR data with other sources such as patient experience, cost, registries
- ✓ Create a single version of the truth, an enterprise analytics data source



## PROVIDE INTUITIVE & INTERACTIVE VISUALIZATIONS

- ✓ Consistent look and feel
- ✓ Reduce learning curve

# Data-guided Performance Improvement



## Increasing Margin

- Increase Revenue

- Do More

- Marketing Analytics
    - Surgical Analytics
    - Care Gaps
    - Capacity Management
    - Referrals Management

- Capture More Revenue

- Registration/Verification
    - Clinical Documentation
    - Denials
    - Accounts Receivable

- Reduce Cost

- Reduce LOS
  - Optimize Staffing
  - Manage Utilization
  - Reduce avoidable ED visits
  - Supply Chain
  - Automation

- Be More Efficient

- Patient Movement
  - Scheduling
  - Productivity
  - Surgical Efficiency
  - Automation

- Do Better

- Reduce Complications
  - Readmissions
  - Mortality
  - Patient Experience



# Agenda

## Increase Revenue

- Surgical Analytics
- Marketing Analytics
- Revenue Cycle Analytics`

## Reducing Cost

- Efficiency and Patient Movement
- Reducing Length of Stay
- Care Paths
- Clinical Effectiveness
- Automation and AI

## Doing Better

- Quality
- Patient Experience

## Getting Started

- Assessments
- Contact Info

# Surgical Analytics



## Case Study: Operating Room Utilization

PROBLEM	GOAL	APPROACH	RESULTS
Operating rooms are sometimes empty and sometimes overbooked and open after hours. Some surgeons do not have enough operating room time available and others need more time. Disruption from COVID-19 has magnified these issues	Increase the amount of the operating room is full and decrease the amount of time the operating room is staffed and empty. Optimize block allocations to the changing needs of surgeon groups.	<ol style="list-style-type: none"><li>1. Track room utilization by hour to optimized staffed hours and volume.</li><li>2. Analyze anesthesia usage and out-of-room staff utilization across surgical and procedural suites to monitor resource constraints.</li><li>3. Analyze service and surgeon block utilization, including: block utilization, block releases, overbooks, unblocked utilization, scheduling patterns</li></ol>	<ul style="list-style-type: none"><li>• 12% higher service block utilization</li><li>• 29% fewer empty staffed rooms</li><li>• 25% lower out of block minutes</li></ul>

Can also be applied to:

- Endoscopy
- Cath Lab
- Electrophysiology
- Interventional Radiology
- Complex Imaging

# DEMO

OR Block Utilization OR Block Utilization - Calendar

**RSM** OR Block Utilization - Calendar [i] [?]

Utilization by Day of Week & Calendar Date [?]

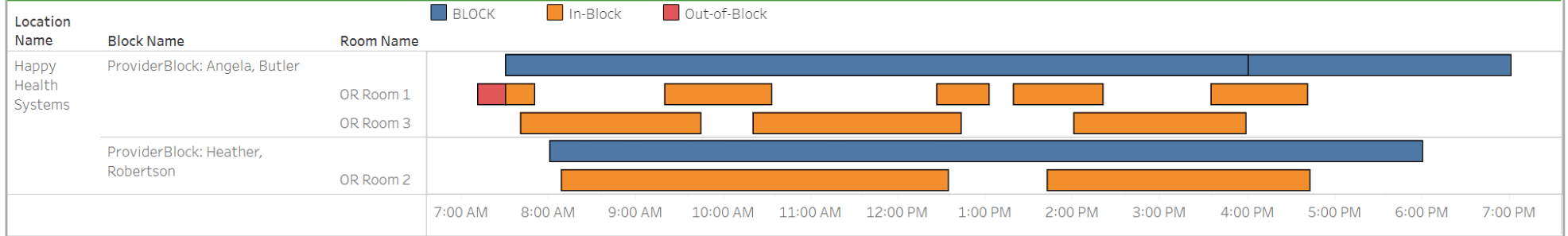
April						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	57%	54%	61%	47%	72%	
				04/01 18%	04/02 54%	
	04/05 50%	04/06 79%	04/07 80%	04/08 39%	04/09 90%	
	04/12 71%	04/13 38%	04/14 73%	04/15 41%	04/16 65%	04/17
	04/19 55%	04/20 32%	04/21 80%	04/22 65%	04/23 69%	
04/25	04/26 50%	04/27 66%	04/28 13%	04/29 67%	04/30 80%	

May						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	87%	59%	39%	41%	51%	
						05/01
	05/03 94%	05/04 57%	05/05 21%	05/06 61%	05/07 11%	
	05/10 83%	05/11 64%	05/12 58%	05/13 21%	05/14 90%	
	05/17 93%	05/18 53%	05/19 33%	05/20 53%	05/21 67%	
	05/24 80%	05/25 63%	05/26 46%	05/27 36%	05/28 36%	
05/30						

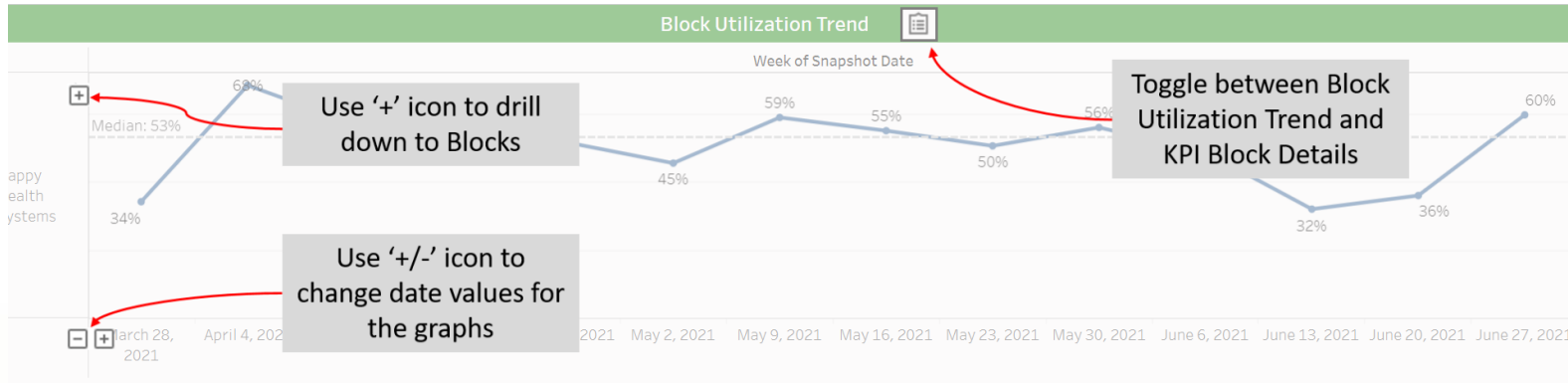
June						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
	61%	52%	49%	17%	47%	
		06/01 53%	06/02 55%	06/03 73%	06/04 41%	06/05
06/06	06/07 50%	06/08 47%	06/09 73%	06/10 0%	06/11 82%	06/12
	06/14 60%	06/15 48%	06/16 35%	06/17 0%	06/18 19%	
	06/21 56%	06/22 58%	06/23 31%	06/24 0%	06/25 48%	
	06/28 78%	06/29 56%	06/30 54%			

Over Utilization Goal ■ Under Utilization Goal ■

Happy Health Systems OR Blocks/Utilization for April 7, 2021



## DEMO



**OR Block Utilization**

Toggle between Block Utilization chart by day and Block Utilization summary metrics

Name	% of Blocks	# of Surgeries
GroupBlock: HHS Family	0%	3
Block: Christopher, Rod	0%	9
Block: Belinda, Hicks	0%	12
Block: Fiona, Alexander	0%	34
Block: Heather, Robertson	48%	37

**OR Metrics by Surgeon**

Select filters

Primary Surgeon	# of Surgeries	% In-Block	% Out-of-Block	% Unblocked	Unblocked Minutes
Andrew, Brown	90			2%	336
Angela, Butler	89			6%	607
Belinda, Hicks	12	75%	25%	0%	0
Carol, Wagner	82	91%	3%	6%	305
Carolyn, Tucker	5	44%	2%	54%	155

### OR Block Utilization Definitions

Clicking the "Revert" button above the dashboard's title on the left will undo filter selections most of the time.

#### KPI Definitions

- **% Block Utilization:** (Minutes In Block + Turnover Minutes In Block) / Block Allocation Minutes. Unless otherwise stated, this is the metric being displayed.
- **% In Block:** (Minutes In Block + Turnover Minutes in Block) / Total Minutes
- **# of Surgeries:** A count of distinct Log IDs representing the number of surgeries performed regardless of whether a block was assigned.
- **% Out of Block:** (Minutes Out of Block + Turnover Minutes Out of Block) / Total Minutes
- **% Unblocked:** Unblocked Minutes / Total Minutes
- **% Released of Blocks:** Manually Released Minutes / (Block Allocation Minutes + Manually Released Minutes)

#### KPI Component Definitions

- **Total Minutes:** Minutes In Block + Turnover Minutes In Block + Minutes Outside of Block + Turnover Minutes Outside of Block + Unblocked Minutes.
- **Minutes In Block:** Procedure Minutes that happen during the time of an allocated block.
- **Minutes Out of Block:** Procedure minutes that happen before or after the time allocated to the block on that day.
- **Turnover Minutes Out of Block:** Turnover minutes that happen before or after the time allocated to the block on that day.
- **Unblocked Minutes:** Procedure minutes that happen on a day when the group, service and surgeon do not have a block at that location.

#### Supporting Definitions

- **Block:** A block assigned to a group, surgeon or service which was not manually released.
- **Snapshot Date:** Day of procedure/block instant
- **Procedure Minutes:** Minutes while patient is in the Operating Room
- **Block Allocation Minutes:** Number of minutes during allocated blocks.
- **Turnover Minutes:** Time from previous case wheels out to current case wheels in. If this number is > 90, then the turnover for this case isn't used. If

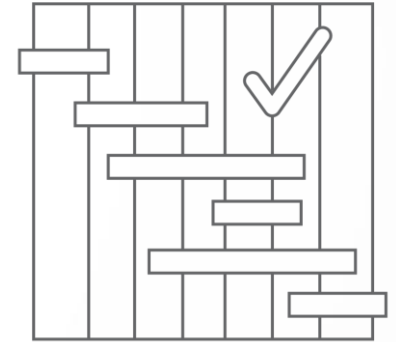
# Surgical Efficiency

The perioperative suite is one of the busiest areas of the hospital, generates the most revenue and incurs the highest costs. Therefore, throughput and efficiency are vitally important.

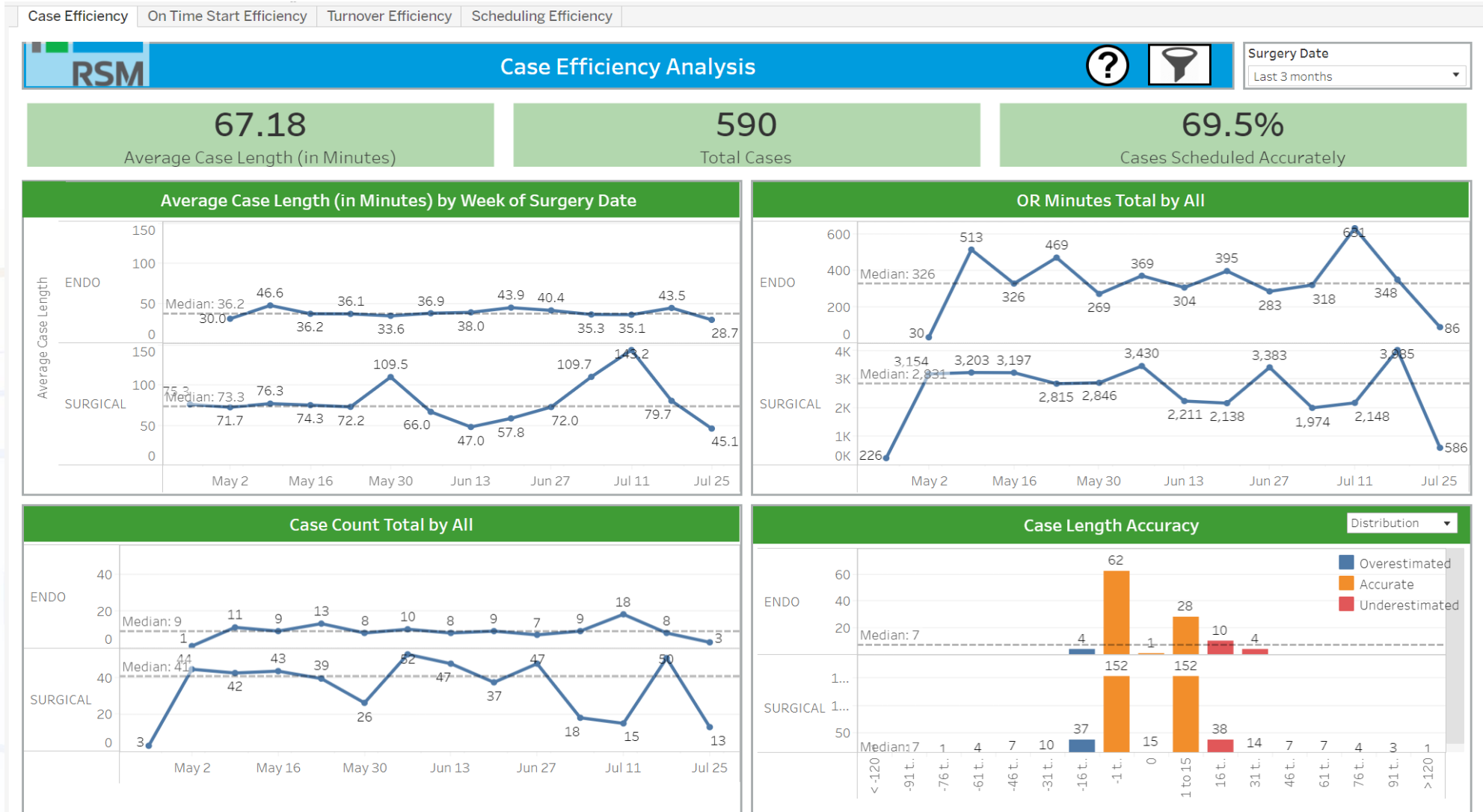
## SOME OF THE IMPORTANT KPIS TO TRACK EFFICIENCY INCLUDE:

- ✓ On-time starts
- ✓ Cancellations
- ✓ Add-ons
- ✓ Turnover and turnaround times
- ✓ PACU boarding times
- ✓ Case duration accuracy

**Through analytics we can monitor the efficiency and also look for causes of inefficiencies.**



# DEMO



# MARKET ANALYTICS





# Marketing Analytics

- What providers should I hire? Or collaborate with?
- Should I build an ambulatory surgical center?
- Where should I invest?
- Should I buy an orthopedic surgery group?

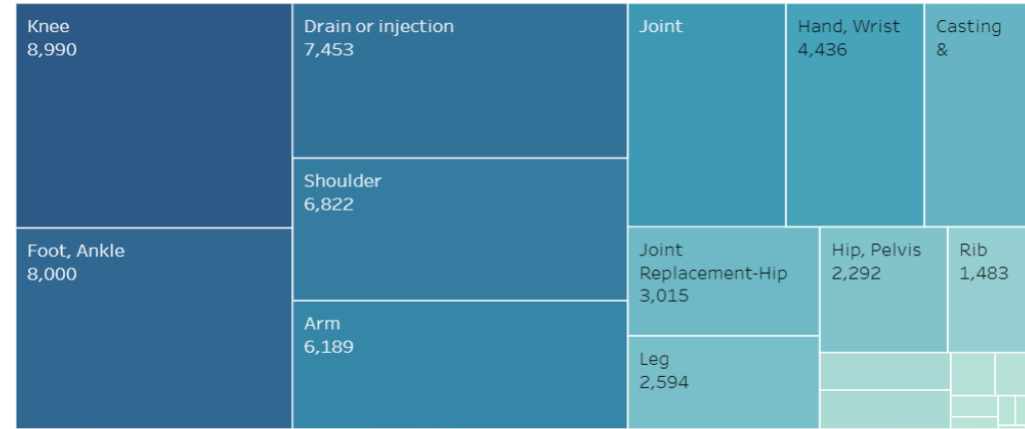
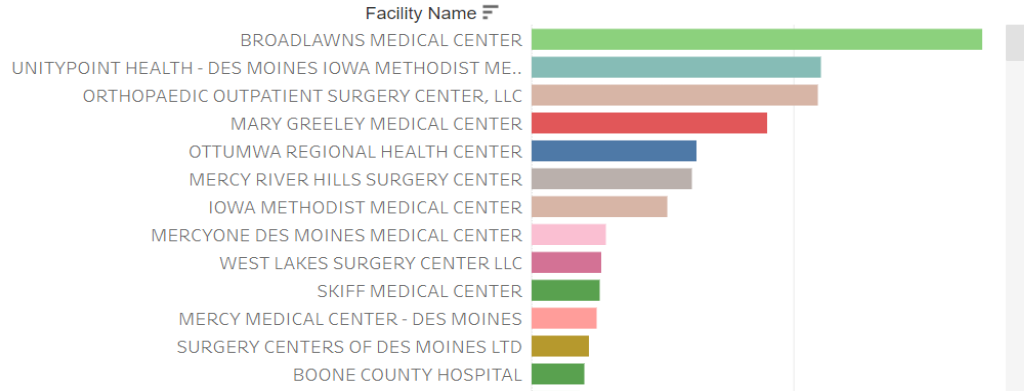
*To answer these types of questions, we leverage claims data*

- For patients in my geography who go to other health systems, what specialists are they seeing? What procedures?
- When my doctors refer to other providers, what specialists do they refer to?
- How many orthopedic surgeries are performed in my area? What ancillary services are received?

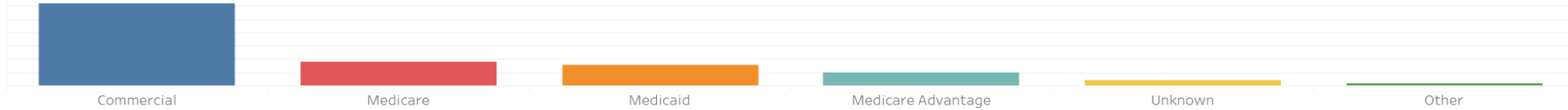
# DEMO



[SHOW FILTERS & PARAMETERS](#)



Payer Type



Payer Type	Payer Name	Value	Procedure Service Line	Value
Commercial	BCBS IOWA (WELLMARK)	12,728	Orthopedics	\$600,071,270
	BC/BS OF IOWA - WELLMARK	9,370	DME & Supplies	\$81,560,270
	UNITED HEALTHCARE	5,362	Radiology	\$40,880,834
	UNITED HEALTH CARE	3,358	Neurosurgery	\$33,355,823
	IOWA TOTAL CARE	2,822	Physical Rehabilitation	\$18,272,000
	UMR	1,983	Evaluation & Management	\$12,190,926
	AETNA	1,742	General Surgery	\$6,435,565
	UHC HMO 87726	1,697	Drugs	\$3,460,479
	MEDICA	1,307	Hospital Observation	\$2,925,462
	WELLMARK IP OP	1,178	Hospital Inpatient	\$2,711,517
	HEALTH PARTNERS - MINNESOTA	1,070	Emergency Department	\$1,685,788

# DENIAL ANALYTICS

# RevNsight Denial Analytics

Improving the denial success rate throughout your health care organization's revenue cycle

Quickly determine root causes of denials with our customized solution tailored to your needs

Whether your organization is facing challenges in regards to poor denial reporting, outdated denial processes - or you are looking to **recoup lost revenue and maximize reimbursements** - RSM can help improve your denial success rate throughout your revenue cycle utilizing our interactive denial application. We drive a tailored and customized solution allowing you to quickly and easily determine root causes of denials.

## OUR APPROACH

- Out of the box deployment using your 835 ERAs
- Quick deployment, usually in a matter of 3-4 weeks
- Drill down capability to the line item denial level
- Ability to spot trends in denials and navigate to accounts currently denied in your AR
- Provide weekly support to update, validate and publish the dashboards

## OUR INTERACTIVE DENIAL APPLICATION CAPABILITIES

Our interactive 835 application allows you to quickly and easily determine the cause(s) of denials and compliments the ability to monitor overturned denials.

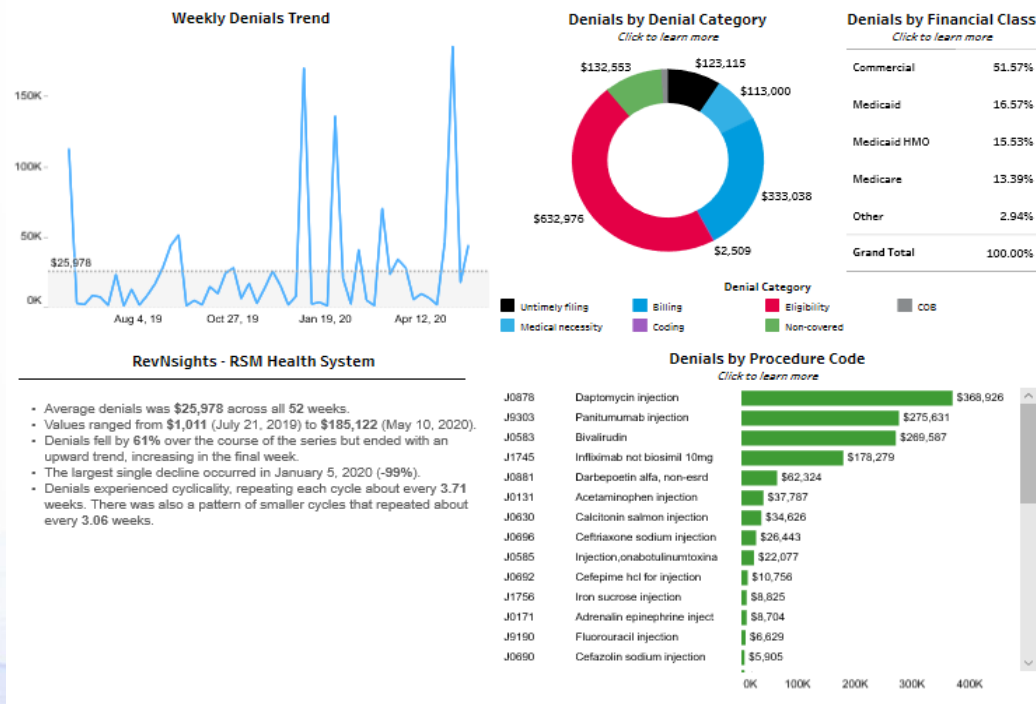
### Questions we can answer:

- ✓ Top procedure issues
- ✓ Payer issues
- ✓ Provider issues
- ✓ Facility/Clinic issues
- ✓ Hospital vs. Physician issues
- ✓ Front, middle and back revenue cycle issues

## REVNSIGHTS

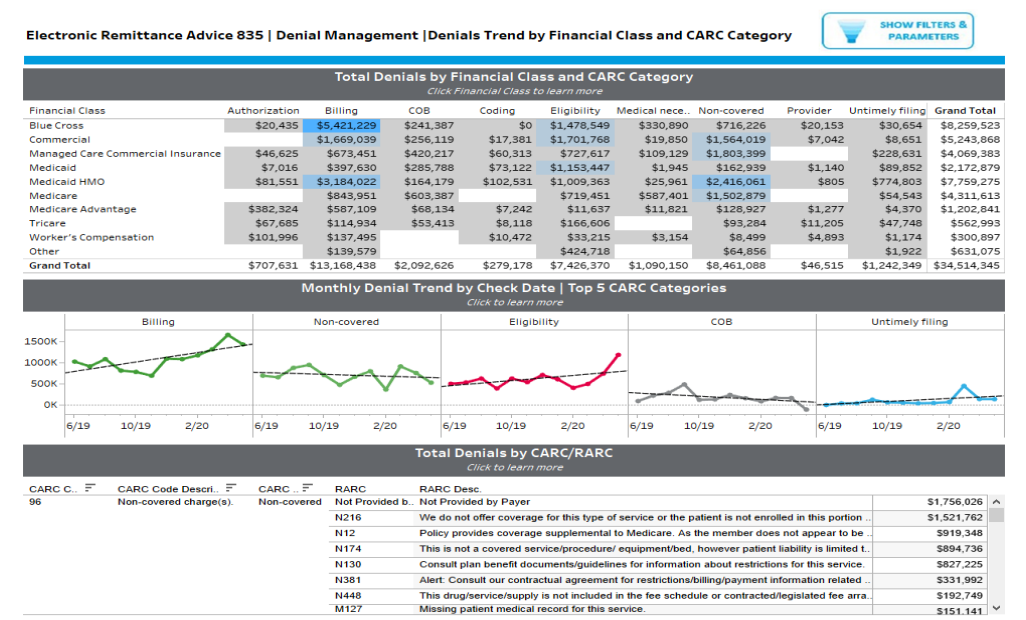
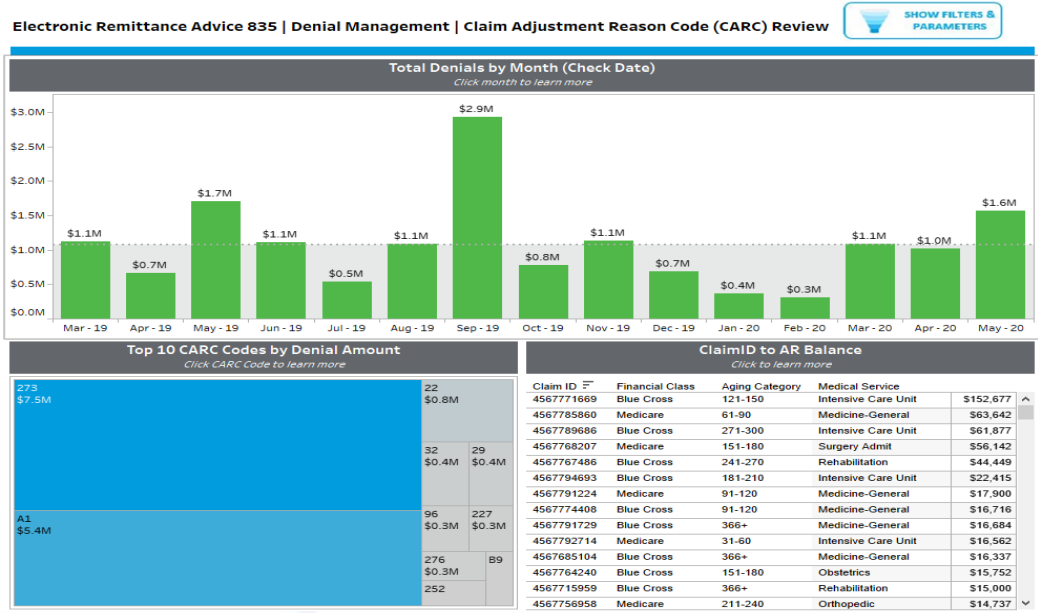
- Our RevNsights empower your end users to understand your data through stories.
- Tailored stories to your end users
- Quickly understand what data is most important
- Easily add stories to your dashboards

DASHBOARD EXAMPLE



# RevNsight Denial Analytics

DASHBOARD EXAMPLES



## CONSIDERATIONS

- Are you satisfied with your current revenue metrics?
- Have you considered looking beyond your EMR reporting to quantify your organization's visibility to net revenue and cash collection?
- Have you considered using forward-thinking technologies to improve organization performance?
- Is your organization working as effectively as it should?
- Are there issues with your workflow causing revenue leakage?
- Are all facilities fully optimized?

# RevNsight Performance Analytics

Understand your organization's financial and operational performance

- Quickly determine cash collection and missed revenue with our solution tailored to your needs.

Whether your organization is facing challenges in regards to poor reporting, inadequate processes - or you are looking to recoup lost revenue and budget for next quarter - RSM can help throughout your revenue cycle utilizing our interactive performance analytics application. We drive a tailored and customized solution allowing you to quickly identify cash collection issues and forecast for next year.

## OUR APPROACH

- Deployment using your organization's reporting
- Drill down capability to the item of lowest grain
- Ability to spot trends and identify high dollar accounts in your A/R to accelerate the most cash for the least effort
- Provide weekly support to update, validate and publish the dashboards

## OUR INTERACTIVE APPLICATION CAPABILITIES

- Our interactive application allows you to quickly and easily determine the categories with the highest A/R .

### Questions we can answer:

- ✓ WIP changes week to week
- ✓ Productivity issues
- ✓ Payer issues
- ✓ Billing Trends
- ✓ Account stratification
- ✓ Front, middle and back revenue cycle issues

## REVNSIGHTS

- Our RevNsights empower your end users to understand your data through stories.
- Tailored stories to your end users
- Quickly understand what data is most important
- Easily add stories to your dashboards

DASHBOARD EXAMPLE

### Cash Analysis

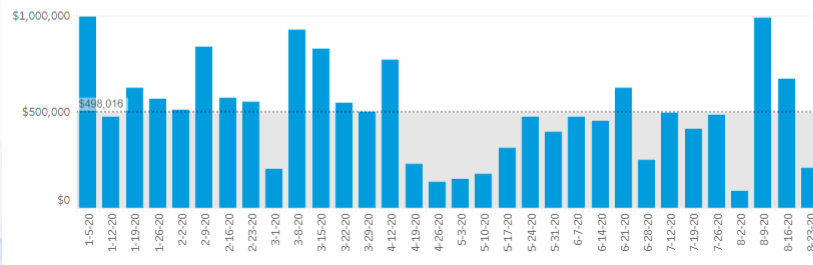
SHOW FILTERS & PARAMETERS

#### Cash Waterfall All

Service Date Across and Post Date Down

	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Grand Total	Percent of Total		
										Current Month	Prior Month	Previous Months
Jan-20	1,101,913								1,101,913	100.00%		
Feb-20	1,465,515	824,493							2,290,007	36.00%	64.00%	
Mar-20	301,605	1,524,033	858,416						2,684,054	31.98%	56.78%	11.24%
Apr-20	83,714	303,151	813,519	70,762					1,271,146	5.57%	64.00%	30.43%
May-20	45,777	57,272	87,142	83,689	781,641				1,055,521	74.05%	7.93%	18.02%
Jun-20	17,998	18,673	36,459	18,463	967,705	980,114			2,039,412	48.06%	47.45%	4.49%
Jul-20	14,929	14,874	21,516	19,515	230,804	1,368,982	778,361		2,448,981	31.78%	55.90%	12.32%
Aug-20	5,908	7,061	5,087	3,236	20,546	134,650	1,172,131	596,222	1,944,841	30.66%	60.27%	9.07%
Grand Total	3,037,359	2,749,558	1,822,140	195,664	2,000,696	2,483,746	1,950,492	596,222	14,835,877			

#### Week over Week Cash All



#### RevNsights - RSM Health System

Accounting for your selection, this analysis measures cash by week.

- Average cash was \$498,016 across all 32 weeks.
- Values ranged from \$86,234 (August 2, 2020) to \$996,877 (January 5, 2020).
- Cash decreased by 79% over the course of the series from \$996,877 to \$209,015 and ended with a downward trend, decreasing by \$461,570 in August 23, 2020.
- The largest single decline on a percentage basis occurred in August 2, 2020 (-82%). However, the largest single decline on an absolute basis occurred in April 19, 2020 (-\$543,545).
- The largest single increase immediately followed the biggest single decrease, when it rose 1,047% from \$86,234 to \$989,134 in August 9, 2020.
- Cash showed the longest span of consistent growth over four weeks from April 26, 2020 to May 24, 2020, **rising by 252%**.
- Cash showed the longest spans of consistent decline over three weeks from February 9, 2020 to March 1, 2020, **falling by 76%**, and from March 8, 2020 to March 29, 2020, **falling by 46%**.
- Cash fluctuated over the course of the series with 67% of data points moving in the opposite direction from the previous week.

Location(s) Included:All  
Billing Dr(s) Included:All  
Insurance Category:All

# EFFICIENCY AND PATIENT MOVEMENT

# Goals and Opportunities

- Reduce length of stay
- Reduce ED and PACU boarder time
- Increase surgical and transfer volumes
- Improve quality of care
- Optimize staffing

## How?

- Reduce unnecessary bottlenecks and delays
- Predict occupancy and patient needs
- Know occupancy constraints ahead of time and mitigate them



# Reducing Length of Stay

Length of stay is the biggest factor for inpatient cost.

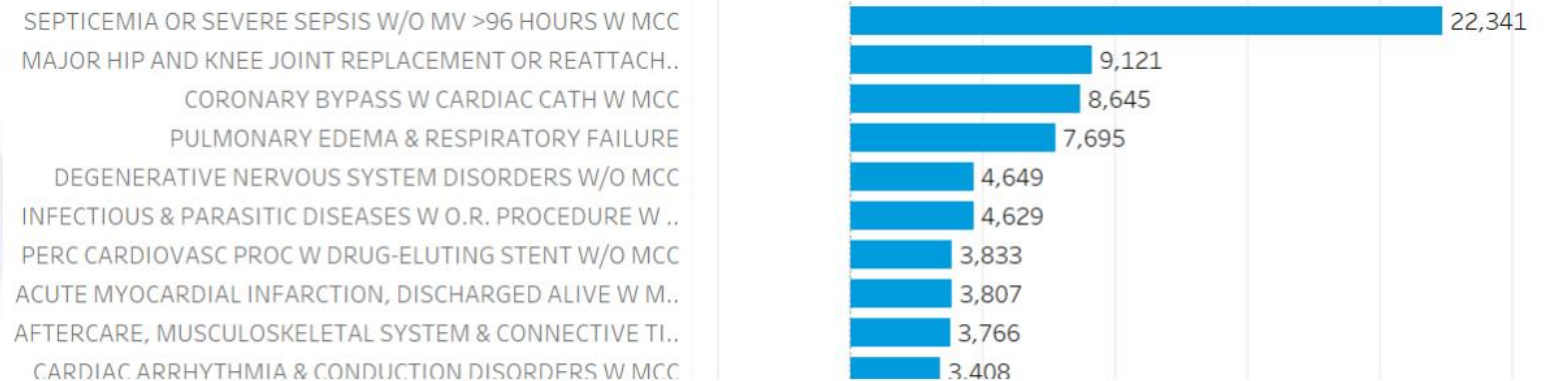
There are two fundamental ways to reduce LOS

1. Be more efficient
  - Reduce Wait Times (ED boarder, PACU boarder, Patient Movement, Discharge)
  - Optimize multi-disciplinary rounds
2. Cure patients faster
  - Disease Care Paths
  - Reduce Complications

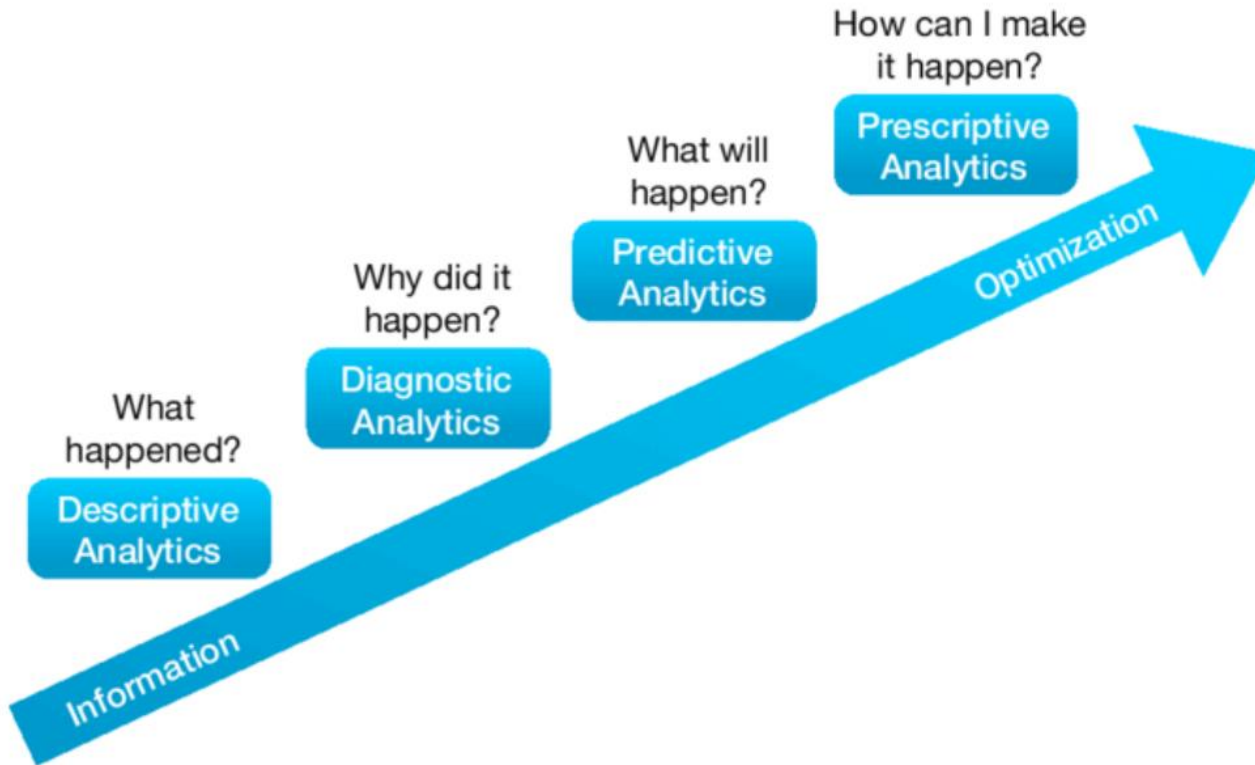
The first step is identify opportunities

- What diseases have greatest length of stay opportunity?
- What units or processes have inefficiencies?
- What complications are affecting length of stay?

## Length of Stay Opportunity by DRG



# Iterative Approach



## Analytics

- When and where are the bottlenecks?

## Causal Analysis

- What is causing delays?

## Predictive Analytics

- What will the occupancy be?

## Discrete Event Modeling

- What actions or resources will help us improve?

# Efficiency and Patient Movement

- Track all patient movements
- Forecast expected patient movements
- Measure patient movement time
  - By origination, target, day, time, service
- Identify delays and patterns
- Causal analysis: What is causing delay?
  - Lack of capacity?
  - Waiting on another event?
  - Process?

# USE CASES

## Discharges

- Order wheelchairs and walkers prior to discharge order

## ED

- Improve sepsis care by creating ED lab
- Reduce overflow by predicting volumes 72 hours ahead

## Admissions

- Predict capacity issues ahead of time
- Reduce number of people waiting for a bed from 78 to 24 a day

## ICU

- Reduce number of patients waiting for ICU bed by 33%
- Create capacity by designing ICU observation area
- Reduce number of held empty beds

## Transfers

- Reduce transfer cancellation rate by 40%

## Digital Twin

- Use discrete event simulation to test what-if scenarios and optimize resource allocation

# Case Study: Predicting ED Arrivals and Occupancy

PROBLEM: Emergency Department overfills causing long delays and emergency procedures to create occupancy

GOAL: Predict high occupancy in the emergency room to allow mitigation efforts

APPROACH:

1. Obtain historical data for emergency room patients
2. Augment data with local weather, holidays and events data
3. Predict ED arrivals
  - Evaluate and choose features and algorithms, train and test
  - Chosen features: day of week, time of day, date, temperature, relationship to holidays
4. Predict ED length of stay for patients in the ED using statistics

Based on partial information from: service, date, time, diagnosis, ED events

5. Predict future occupancy

This is a calculation using predicted ED arrivals, current occupancy and predicted ED length of stay for current patients

RESULTS:

Able to predict overflow as Yellow, Orange or Red (previous was just red)

Alerts up to 96 hours ahead

78% accuracy at 72 hours

Can also be applied to:

Urgent Care

Walk-In Clinics

OR

# Case Study: Digital Twin

PROBLEM: Adding resources or demand in one area of a hospital can cause bottlenecks in other areas.

GOAL: Analyze resource constraints and what-if scenarios to predict bottlenecks, occupancy and length of stay. Use this analysis to optimize resource allocation

APPROACH:

1. Map the resources (beds, imaging machines, etc)
2. Fill in what each resource can support (patient type, movement) through data profiling and manual review
3. Extract the clinical treatment plan from historical encounters
4. Randomly push patients/treatment plans through the hospital to test resource constraint usage, bottle necks, throughput
5. Allow resources to be edited to test what if scenarios

PUBLISHED:

Predicting Hospital Capacity and Efficiency  
in *11th International Conference on Health Informatics*

Can be applied to:

- Beds
- Staffing
- Imaging resources
- Clinics
- Operating Rooms

# CARE PATHS

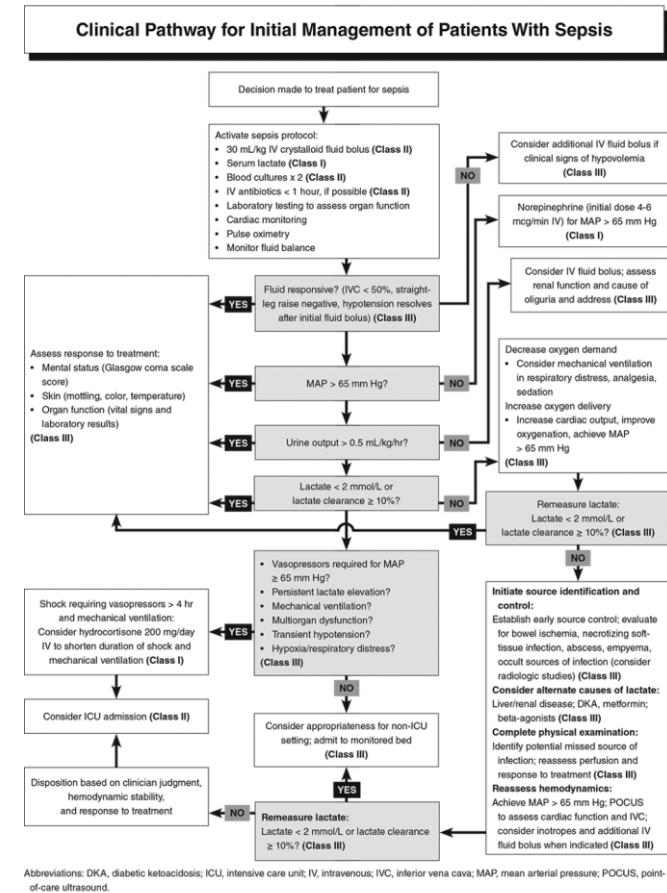


## Standardized Care Paths

- Best practice care pathways can be found as flow charts and decision points in literature.
- Pathways are defined for both acute encounters and chronic disease treatment.
- Standardized analytics apply across all of the care pathways.
- These processes can be implemented and tracked and measured using standardized technology and process intelligence engines

PUBLISHED:

Accelerating Analytics for Clinical Pathways to Drive Cost Reduction and Quality Improvement in *IEEE International Conference on Information Reuse and Integration (IRI)*





## Inpatient Quality: Target Analytics by Care Path

Heart Failure	Sepsis	Sickle Cell Anemia
Stroke	Pneumonia	COVID-19
Acute Coronary Syndrome	Asthma	COPD
Colon Surgery	Preeclampsia	NICU Vent Weaning

### Use Case: Congestive Heart Failure

Protocol	<ol style="list-style-type: none"> <li>1. Identification <i>chief complaint, temperature, blood pressure, pulse</i></li> <li>2. Evaluation <i>blood labs, EKG, chest x-ray, BNP</i></li> <li>3. Treatment <i>Diuretics, oxygenation, weight management</i></li> <li>4. Follow up</li> </ol>
Results	<ul style="list-style-type: none"> <li>↓ LOS 1.5 days</li> <li>↓ Direct cost 16%</li> <li>↓ Readmission 22%</li> <li>↓ Mortality 60%</li> </ul>
Pubs	<ul style="list-style-type: none"> <li>• Improving Patient Care Through Analytics <i>in ISCBI</i></li> <li>• Accelerating Analytics for Clinical Pathways to Drive Cost Reduction and Quality Improvement <i>in IEEE IRI</i></li> </ul>

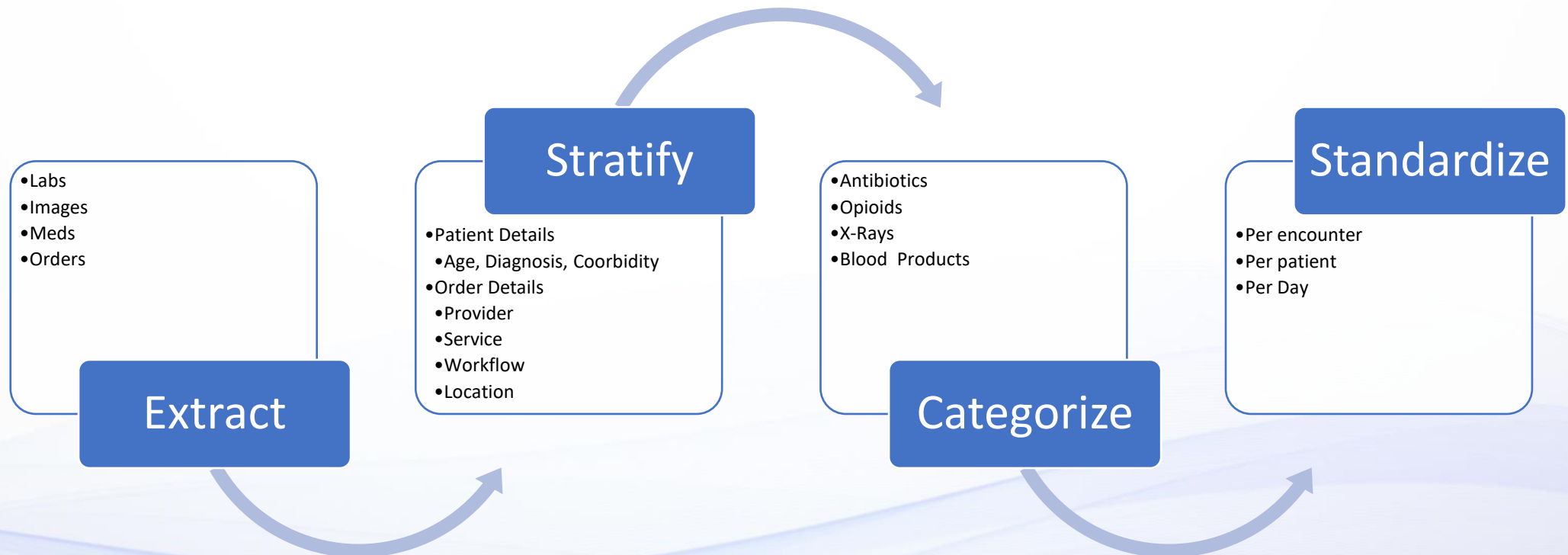
Significant improvement achieved with second iteration

# CLINICAL EFFECTIVENESS

## Reduce Clinical Variation, Save On Costs: DO MORE WITH LESS

**Unwarranted clinical variation** refers to medical practice pattern variation that cannot be explained by illness, medical need, or the dictates of evidence-based medicine. It is one of the causes of low value care often ignored by health systems.

- Our challenge is to **identify clinical variation** and **analyze if it is warranted**.



CASE STUDY:

# Congestive Heart Failure (CHF)

GOAL	APPROACH	RESULTS
Optimize CHF order set	<ol style="list-style-type: none"><li>1. Analyze all orders utilizing the CHF orderset</li><li>2. Analyze all orders for CHF patients which do not utilize the CHF Orderset</li></ol>	<p>As part of this analysis, we learned that a full narcotics screen was being ordered for 95% of CHF patients. Our data showed no clinical usage of the results of this lab, and we then verified this with providers. The cost of the narcotics screen was \$309.</p> <p>We removed the narcotics screen from the default list of orders in the CHF orderset.</p>

Can also be applied to:  
Any orders

CASE STUDY:  
**POKE-R**

PROBLEM	GOAL	APPROACH	RESULTS
<p>PICU patients receive lots of “pokes,” increasing cost, reducing patient experience and causing hospital acquired infections</p>	<p>Provide information to providers to allow reduction of poke</p>	<ol style="list-style-type: none"> <li>1. Define a poke Identify which orders count as “pokes” including blood labs, IV medications, radiology and invasive procedures.</li> <li>2. Present poke information to providers – including:               <ol style="list-style-type: none"> <li>a. Past pokes and scheduled pokes</li> <li>b. Cost information</li> <li>c. Insure data is available during structured rounds</li> </ol> </li> </ol>	<p>12.5% reduction in pokes 5 year savings</p> <p>\$11,058,085 in 26 bed PICU</p>

PUBLISHED:

- Avoiding Pain and Unnecessary Interventions and Reducing Cost in the PICU in *Critical Care Medicine*
- Poke-R - Using Analytics to Reduce Patient Harm in *10th International Conference on Health Informatics*

CASE STUDY:  
Blood Utilization

PROBLEM	GOAL	APPROACH	RESULTS
Patients sometimes receive blood transfusions when not clinically required. This causes adverse outcomes.	Reduce unnecessary red blood cell transfusions, improve outcomes, reduce cost	<ol style="list-style-type: none"><li>1. Evaluate the clinical necessity of blood transfusions based on hemoglobin, base deficit, blood pressure, scvO2, lactate, blood loss, diagnosis</li><li>2. Analyze blood wastage and returns</li><li>3. Provide information for provider evaluation</li><li>4. Use supervised learning to adjust thresholds based on provider evaluations</li></ol>	<ul style="list-style-type: none"><li>• \$3.3 million annual savings</li><li>• 23% fewer units</li><li>• 46% fewer non-indicated units</li></ul>

PUBLISHED:

Reducing Red Blood Cell Transfusions in *International Conference on Information Technology in Bio- and Medical Informatics (ITBAM)*

# PATIENT EXPERIENCE



# Patient Experience and Health Equity: Background

**90% of patients look at customer reviews before scheduling a provider.**

Did you know that hospitals with high patient experience are more profitable? And that consumers with high satisfaction scores achieve better long-term outcomes?

- Patients with high patient experience are 5 times more likely to return to a provider
- 96% of healthcare consumers perceive patient experience as important or very important
- Hospitals with high patient experience have 2 – 3 times higher net margins
- Long term patient outcomes and survival rates are 25% higher for satisfied patients
- 96% of online patient complaints center around customer service — not quality of care
- People of color or lower income have greater infant mortality, lower life expectancy, lower patient experience scores, more health complications, and are less likely to be insured.
- By 2024, most value-based care contracts will measure patient experience and health equity



# Patient Experience and Health Equity: Project

Client(s)	Goal	Initial State Challenges
Corewell Health	Enterprise analytics to <ol style="list-style-type: none"> <li>1. Measure patient experience and health equity across the system</li> <li>2. Identify opportunities for performance improvement</li> </ol>	<ul style="list-style-type: none"> <li>• Stale analytics from vendor</li> <li>• Disparate analytics from different portions of the health system and different vendors</li> <li>• Lack of root cause analysis</li> <li>• Inability to identify how to improve</li> </ul>

## Solution

Data warehouse solution to import vendor results into single, timely version of truth at enterprise level

Use percentiles and benchmarks to create a standardized “gpa”

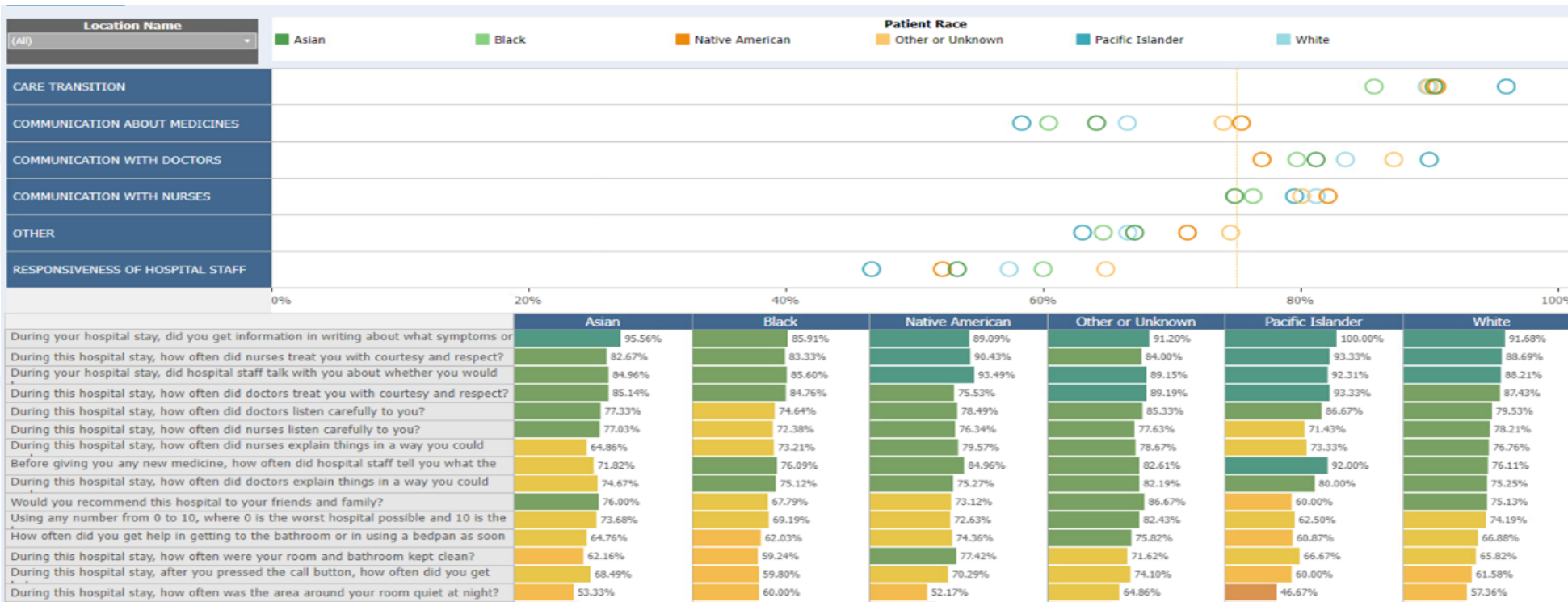
Stratify by question, service, provider and unit to understand who has challenges with what

Stratify by race, education, age, gender, income, sexual orientation and language to include health equity

Integrate patient outcomes (mortality, length of stay, readmission, disposition) to get full view

### Patient Experience and Health Equity: Demo

- Combine patient experience scores with details about patient care
- Measure patient experience for all types of care, not just inpatient
- Measure and review patient experience score early and proactively
- Evaluate patient experience and outcomes by race, language, geography, gender, age

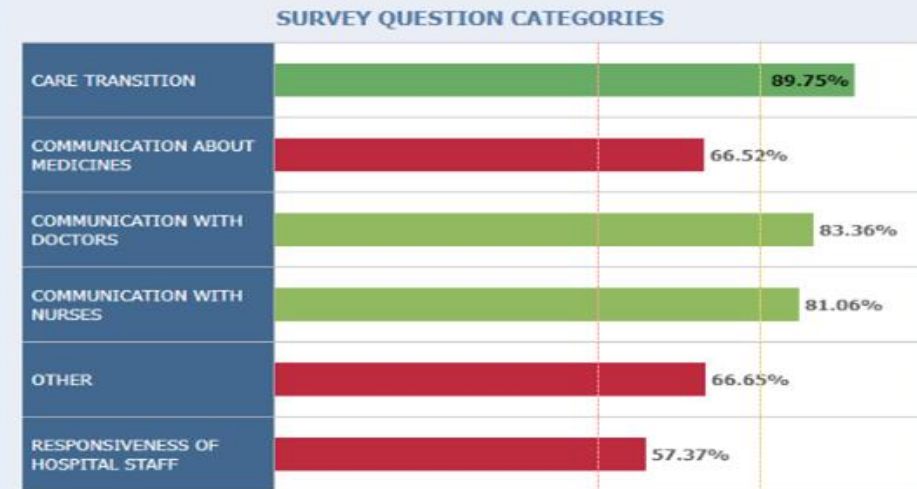


# Patient Experience and Health Equity: Project

Asian	Black	Native American	Other or Unknown	Pacific Islander	White	Total
65.16% 244	67.79% 1,512	75.00% 312	73.56% 174	75.00% 72	69.21% 41,121	69.21% 43,435
64.79% 943	69.09% 2,074	74.28% 836	77.40% 969	67.14% 161	70.66% 70,106	70.65% 75,089
				84.00% 25	64.44% 225	66.40% 250
71.53% 137	67.81% 466	68.95% 190	80.65% 155		74.69% 27,085	74.55% 28,033
92.00% 25	72.96% 270	75.47% 159	90.00% 43		71.92% 8,454	72.20% 8,951
	64.63% 41	92.31% 104	81.25% 48		76.35% 6,241	76.25% 6,434
					64.58% 48	64.58% 48
90.00% 25	68.00% 25	77.94% 68	95.65% 23		69.94% 8,699	70.03% 8,840
	91.30% 23	93.64% 107			72.84% 7,684	72.36% 7,814
					79.47% 302	79.47% 302
80.00% 40	74.64% 138	73.94% 142	77.46% 71	66.67% 21	70.74% 11,176	70.89% 11,588
87.29% 291	92.31% 117	91.16% 147	68.23% 192	85.51% 69	75.62% 12,354	76.14% 13,170
70.50% 1,705	68.92% 4,666	74.09% 2,065	77.19% 1,675	68.97% 348	71.54% 193,495	71.54% 203,954

**OTHER DEMOGRAPHICS**

Sex: (All) Education: (All) Language: (All)



# Automation and AI

# Azure Innovate Program

## Planning phase | Support for developing your deployment plan

Offer   Project size	Engagement activities	Partner funding	Azure credits	Engagement assistance
Partner-led offers >\$25K/year ACR	<ul style="list-style-type: none"> <li>POC/Pilot for Azure Analytics, Build and Modernize AI Apps</li> </ul>	Up to \$10K	Not available	<ul style="list-style-type: none"> <li>Partner-delivered</li> </ul>
MS Field-led offers >\$25K/year ACR	<ul style="list-style-type: none"> <li>Solution Assessment: App Modernization</li> <li>Workshop</li> <li>Proof of concept (POC)/Pilot</li> <li>Analytics Modernization Accelerator (AMA)</li> </ul>	Up to \$45K	Up to \$10K Azure Access PoC Sandbox	<ul style="list-style-type: none"> <li>Solution Assessment is Microsoft technical seller delivered (with Solution Assessment team support); partner may participate</li> <li>Workshops and POC are partner-delivered</li> <li>AMA provides dedicated technical assessment including discovery, analysis of source system, modernization approach &amp; strategy, TCO Analysis, ISV/SI onboarding and next steps</li> </ul>

## Deployment phase | Support to accelerate your Azure deployment

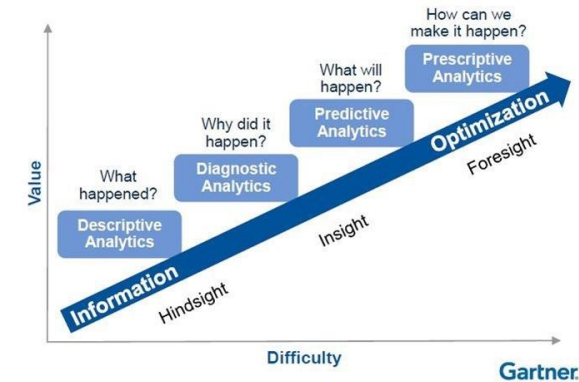
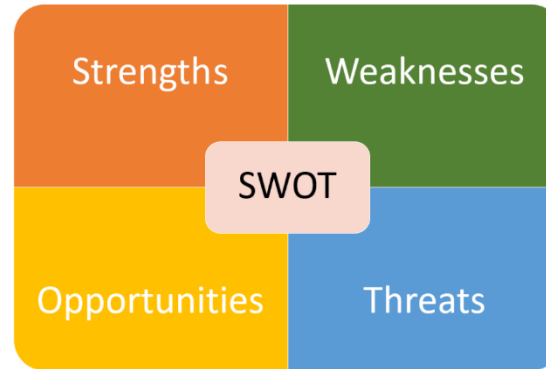
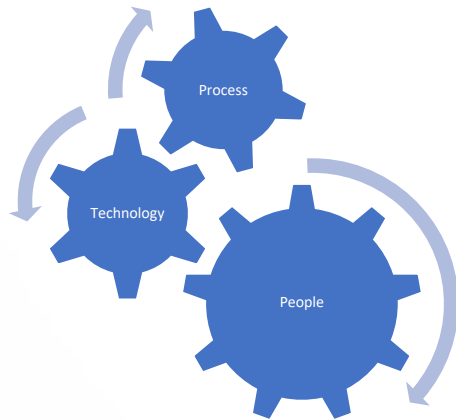
Offer   Project size	Engagement activities	Partner funding	Azure credits	Engagement assistance
Partner-led offers \$25K-\$1.2M/year ACR	<ul style="list-style-type: none"> <li>Deployment activities</li> </ul>	Up to \$50K	Not available	<ul style="list-style-type: none"> <li>Partner-delivered</li> </ul>
MS Field-led offer \$25K-\$1.2M/year ACR	<ul style="list-style-type: none"> <li>Build or review enterprise scale landing zone</li> <li>Deployment activities</li> </ul>	Up to \$120K	Up to \$120K	<ul style="list-style-type: none"> <li>Partner-delivered</li> <li>FastTrack for Azure engineering guidance (available upon request)</li> </ul>
Pre-packaged offer \$25K-\$2.0M/year ACR	<ul style="list-style-type: none"> <li>Analytics Migrations with Databricks P3 Commitment</li> <li>Net new P3 commitments (minimum 350K DBCU for 1Y)</li> </ul>	Up to \$400K	Not available	<ul style="list-style-type: none"> <li>Partner-delivered</li> </ul>

# Top Healthcare Use Cases for Azure OpenAI

- 1. Azure Innovate Assessment**
- 2. Responsible AI Governance Framework**
- 3. Azure Private GPT X and GPT X Teams Application**
- 4. Axe the Fax / Invoice processing**
- 5. Patient Messaging Automation**
- 6. Patient Chart Summarization (FHIR)**
- 7. Analytics Data Enrichment, Curation, Classification, Embedding**
- 8. Supply Chain Documents and Contract Summarization**
- 9. Revenue Cycle, Coding, Prior Authorization and Claim Status**
- 10. Call Center**
- 11. ServiceNow Ticket Triage**

# GETTING STARTED

## 4-6 weeks



## Roadmap

- Work together to create a strategic roadmap to become more data driven and get more value from analytics

### Interview Leaders

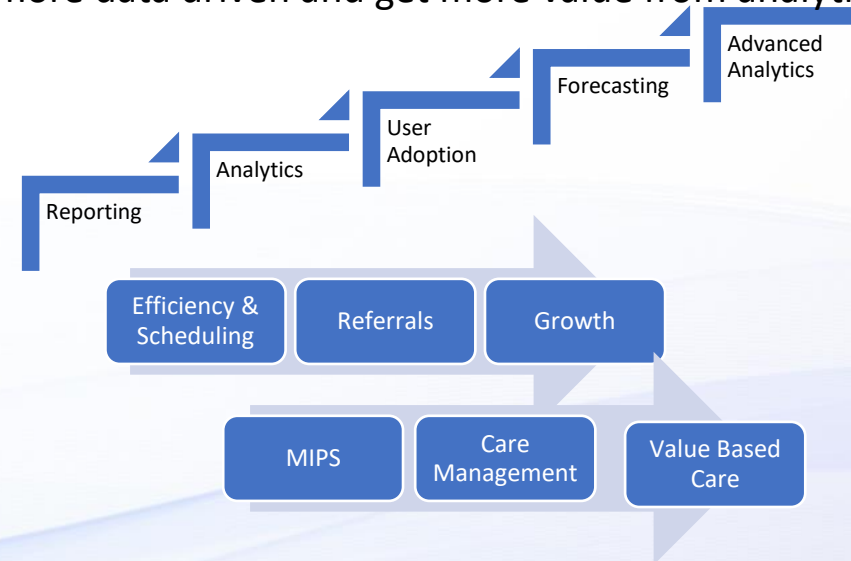
- Understand needs, goals and pain points

### Review Current State

- Examine data architecture, sources, tools and solutions

### Analyze Process

- Understand current process for analytics requests, scoping, data definitions, prioritization and delivery





### Traditional assessment plus quantify ROI

LOS Opportunity	Discharge Efficiency	ED Boarder Time	Scheduling Efficiency	OR Block Utilization
Denials	Write-offs	CMI	Market share for specialties	Avoidable ED visits
Supply cost	Clinical variation	Supply waste	Blood utilization	ACO Metrics
Medicare Wellness	Readmissions	Observation Analytics	Payment Variation	Cash Collections
Authorizations	LWBS rates	Preference card analysis	Pharmacy costs	Automation Opportunities

## Example Assessment – Opportunities Identified

Focus Areas	Est. Moderate	Est. Aggressive
Surgical Efficiency and Process Improvement	\$ 2,000,000.00	\$ 2,400,000.00
Patient Throughput and Care Management-Decrease LOS and Social Admissions	\$ 5,000,000.00	\$ 10,000,000.00
Clinical Volume Growth and Process Improvement	\$ 2,000,000.00	\$ 2,500,000.00
Revenue Growth Strategy*	\$ 5,600,000.00	\$ 14,200,000.00
Intermediate Care Facility /CMS Innovation Project	\$ 1,350,000.00	\$ 3,700,000.00
Disease Specific Analytics	\$ 1,500,000.00	\$ 2,500,000.00
Clinical Effectiveness	\$ 2,500,000.00	\$ 4,000,000.00
Staffing Resource Management	\$ 2,000,000.00	\$ 3,000,000.00
Pre-Service / Patient Access	\$ 1,950,000.00	\$ 3,100,000.00
Revenue Integrity / HIM / Coding	\$ 1,260,000.00	\$ 2,410,000.00
Billing and Reimbursement	\$ 4,550,000.00	\$ 8,900,000.00
Clinical Documentation Improvement (CDI)	\$ 5,600,000.00	\$ 8,500,000.00
Supply Chain	\$ 2,770,000	\$ 4,035,000.00

# QUESTIONS & ANSWERS

QUESTIONS AND ANSWERS?

Let's Connect

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