

What if JP Morgan, Amazon and FedEx delivered care?

Value through *precision care guidance*

Learning objectives



Consider the potential of technologies from other industries to improve patient care (and yes, a word about AI and ML)



Discuss how analytics will drive assessments of quality, outcomes, and effectiveness in care delivery



Understand who will thrive in this New World Order and how to best prepare

Can you imagine?

J.P.Morgan

Alerting you to fraud 6 weeks after the fact?

amazon

Not giving you product recommendations?

FedEx

Not tracking its packages in real time?

Analytics are revolutionizing industries and sports



SPORTS

QBR, WAR, PER



ADVERTISING

Micro segmentation; behavioral targeting; personalized nudges



RETAIL

NPS; sales per square foot; 2 day delivery; A/B tests

Healthcare is at the cusp of its own revolution

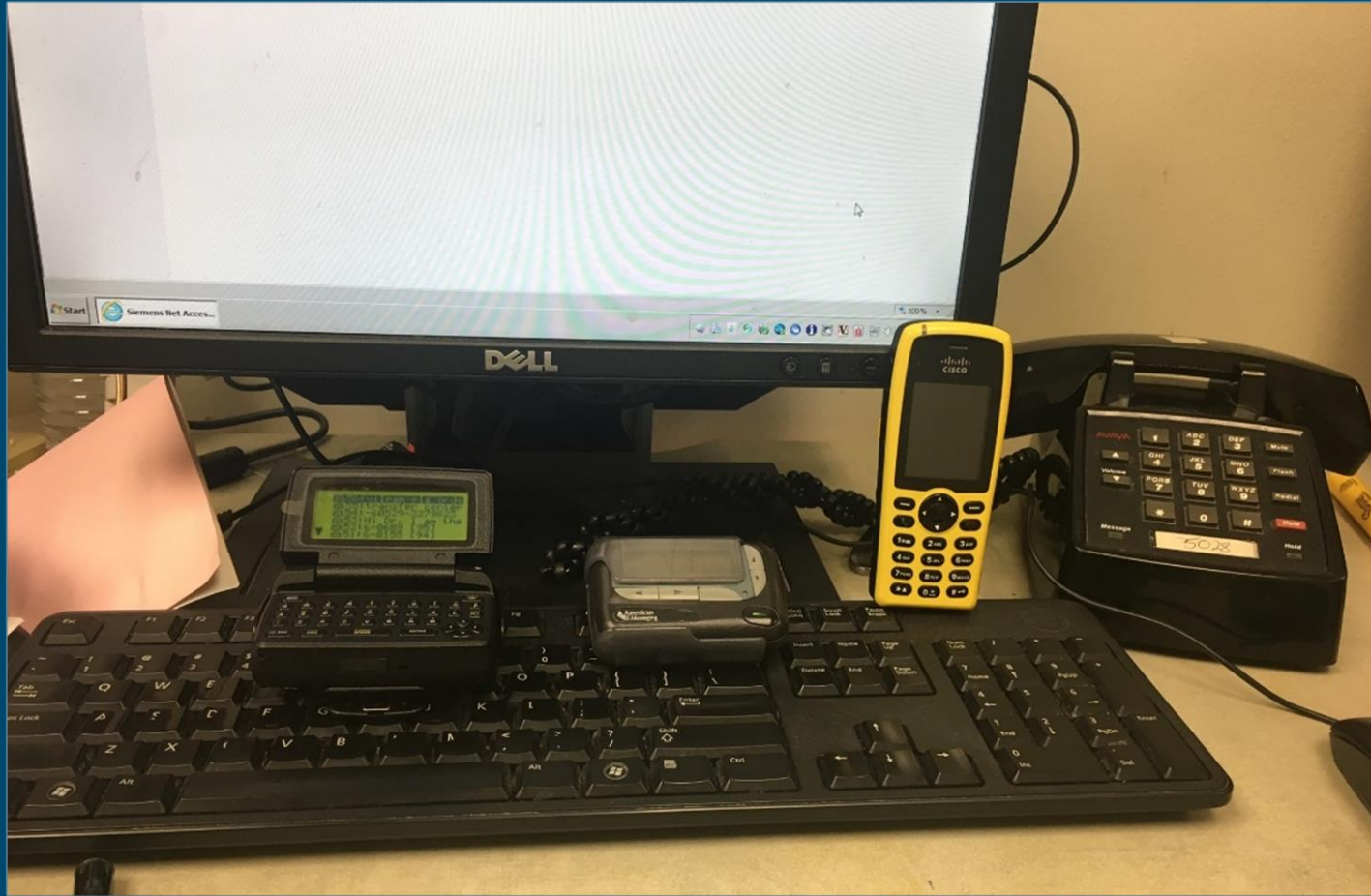
“We now need platforms to manage risk and workflow in the same way financial institutions and logistics companies do.”

Mark Froimson MD
Former Vice Chair, Cleveland Clinic



Pay-for-Performance (P4P)
BPCI-A / CJR / Commercial Bundles
Accountable Care Orgs (ACOs)
Medicare Advantage (MA)
Integrated Delivery Networks (IDNs)

Would you take risk with this technology?



Feb 2017: Physician workstation at major San Francisco hospital

Today's care processes are built for maximum variation

“ I don't need more useless data. My patients are far more acute and complex than you show!”

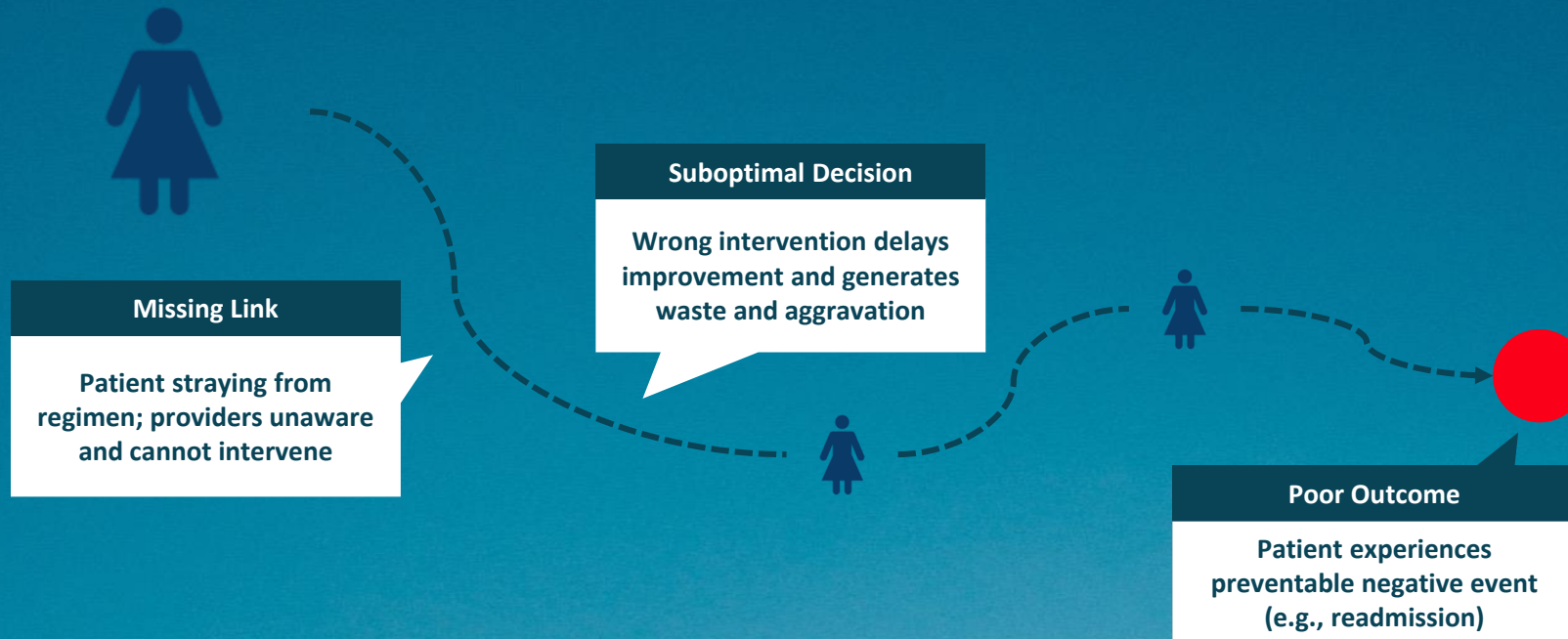
- Physician

“ I'm confused. What did my doctor say? Should I take this dose today?”

- Patient

“ I'm exhausted. I've got 50 patients on my panel and I can't keep up.”

- Care Manager



2.5-15x
variance in cost for same episode of care in same market¹

250K
avoidable deaths; among 5 leading causes of death²

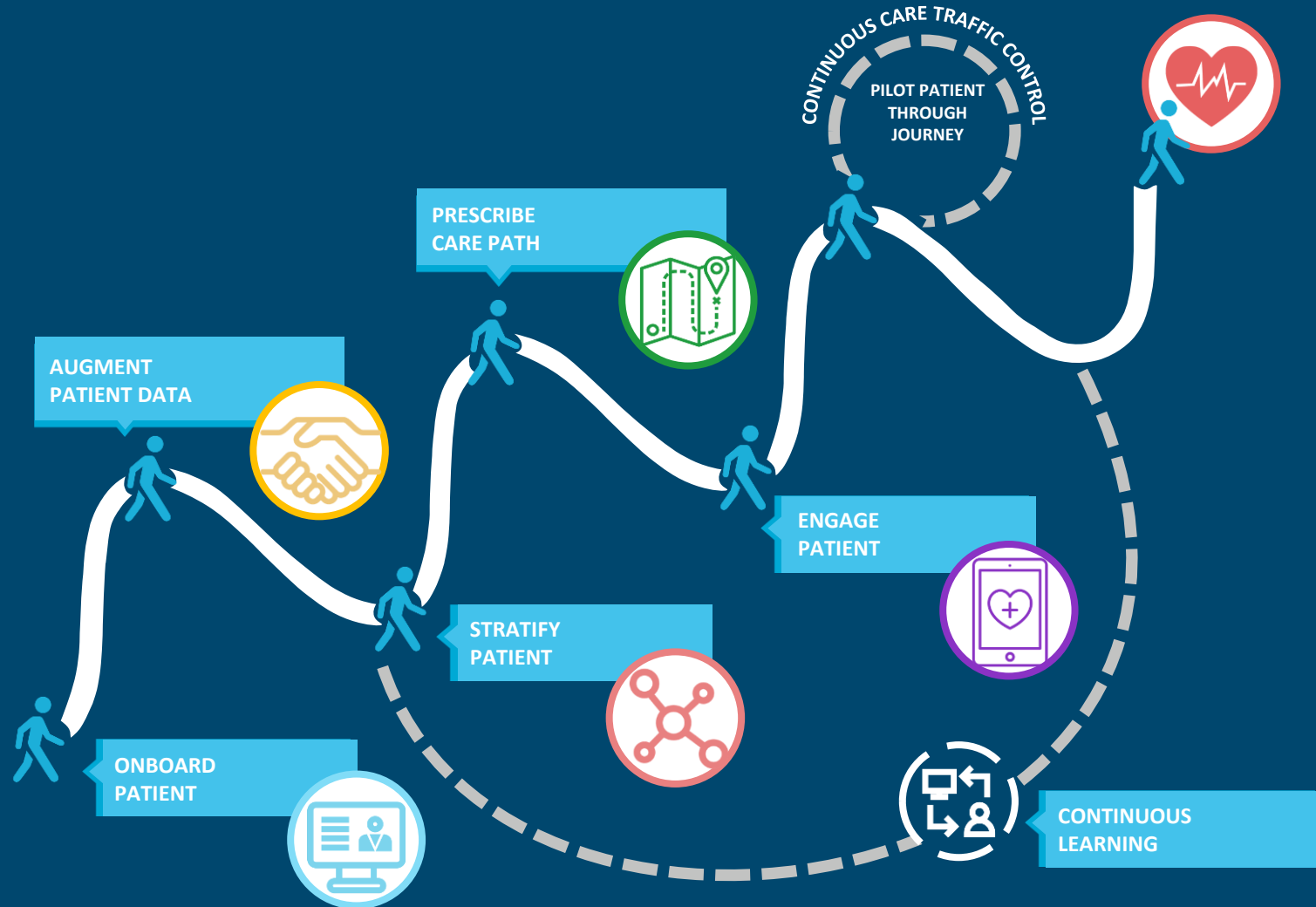
1/2
patients do not understand type of care needed post-discharge³

¹ HealthAffairs: Wide Variation In Episode Costs Within A Commercially Insured Population Highlights Potential To Improve The Efficiency Of Care; <https://doi.org/10.1377/hlthaff.2012.0361>

² Diseases of the heart, Cancer, Chronic lower respiratory disease, Stroke, Unintentional injuries (CDC, 2016 Morbidity and Mortality Weekly Report)

³ HCAHPS Survey Results, 2017

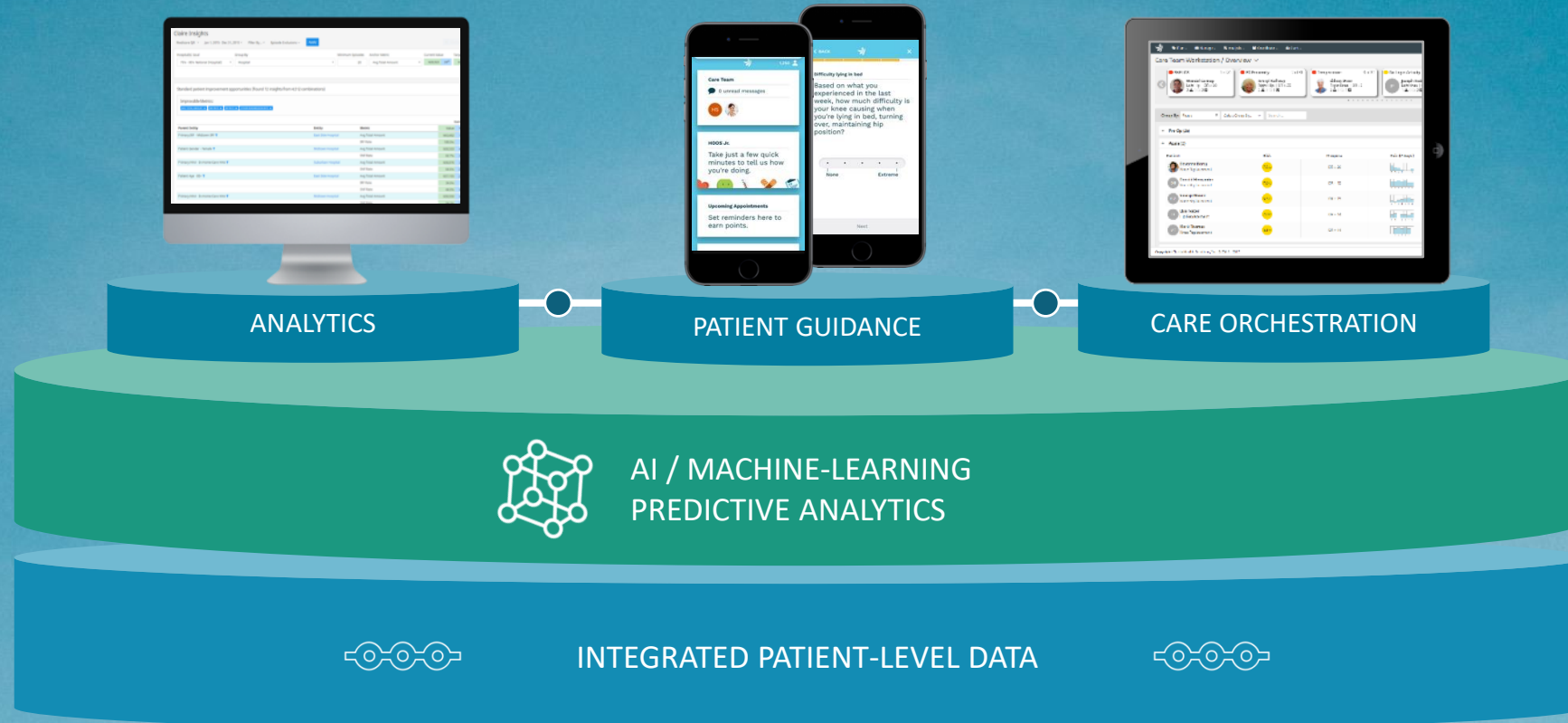
New World Order: Precision care guidance



“This is the **future** of great patient care.”

*Dr. Jack Cochran, Former
Executive Director/CEO,
Permanente Federation*

Risk analysis and logistics platforms will become the new normal in healthcare



This will all be powered by massive data sets

What's different about this?



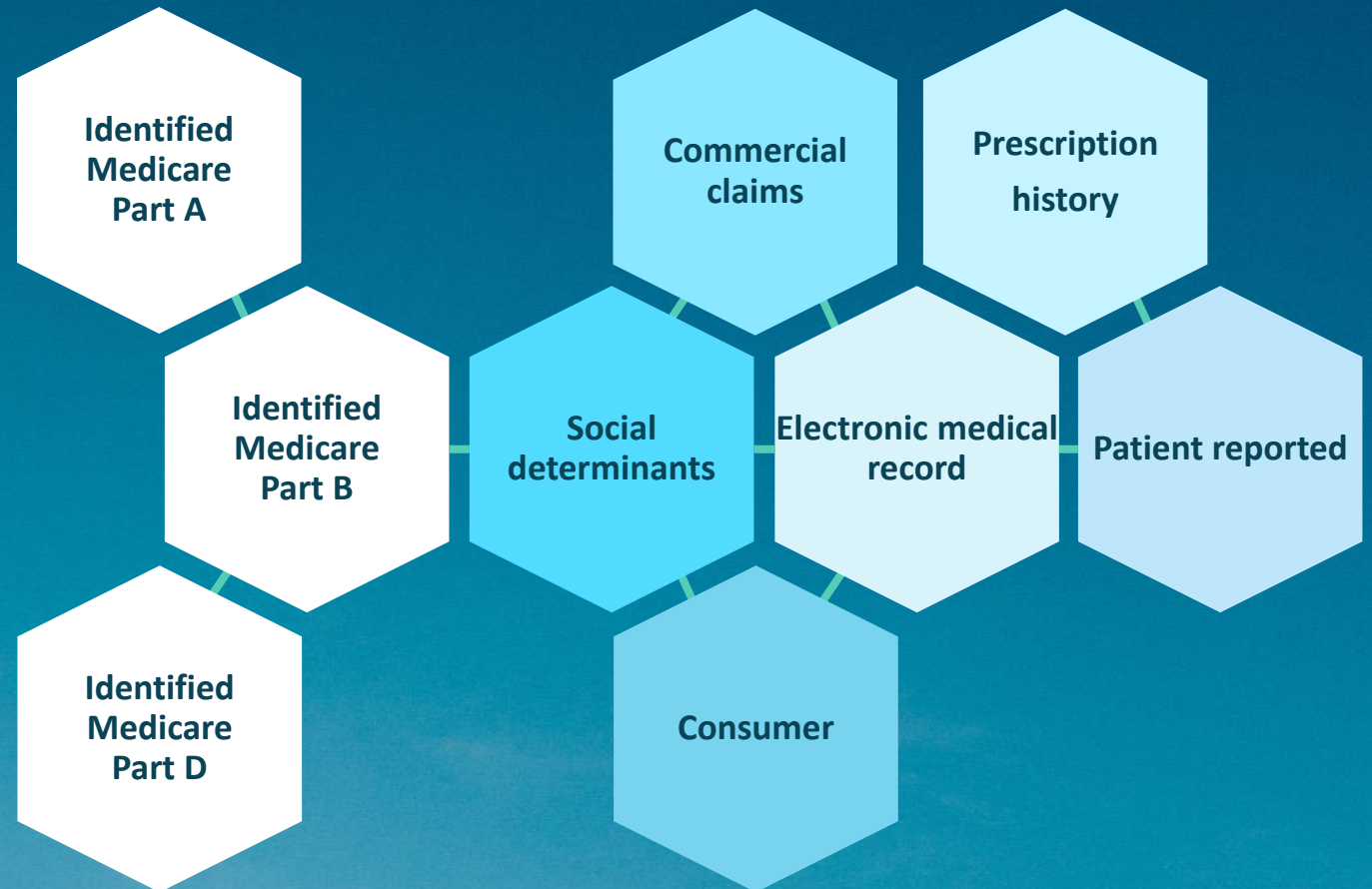
Ability to link previously siloed data to create a rich, patient-level data set




Richer data allows providers to drill down into data, giving doctors insights they trust



Ability to bring in social determinants of health at the individual level to accurately risk-stratify populations



 Examples of types of data that can be linked

And the same kind of technology stack used by banks like JP Morgan

Goodbye to pivot tables

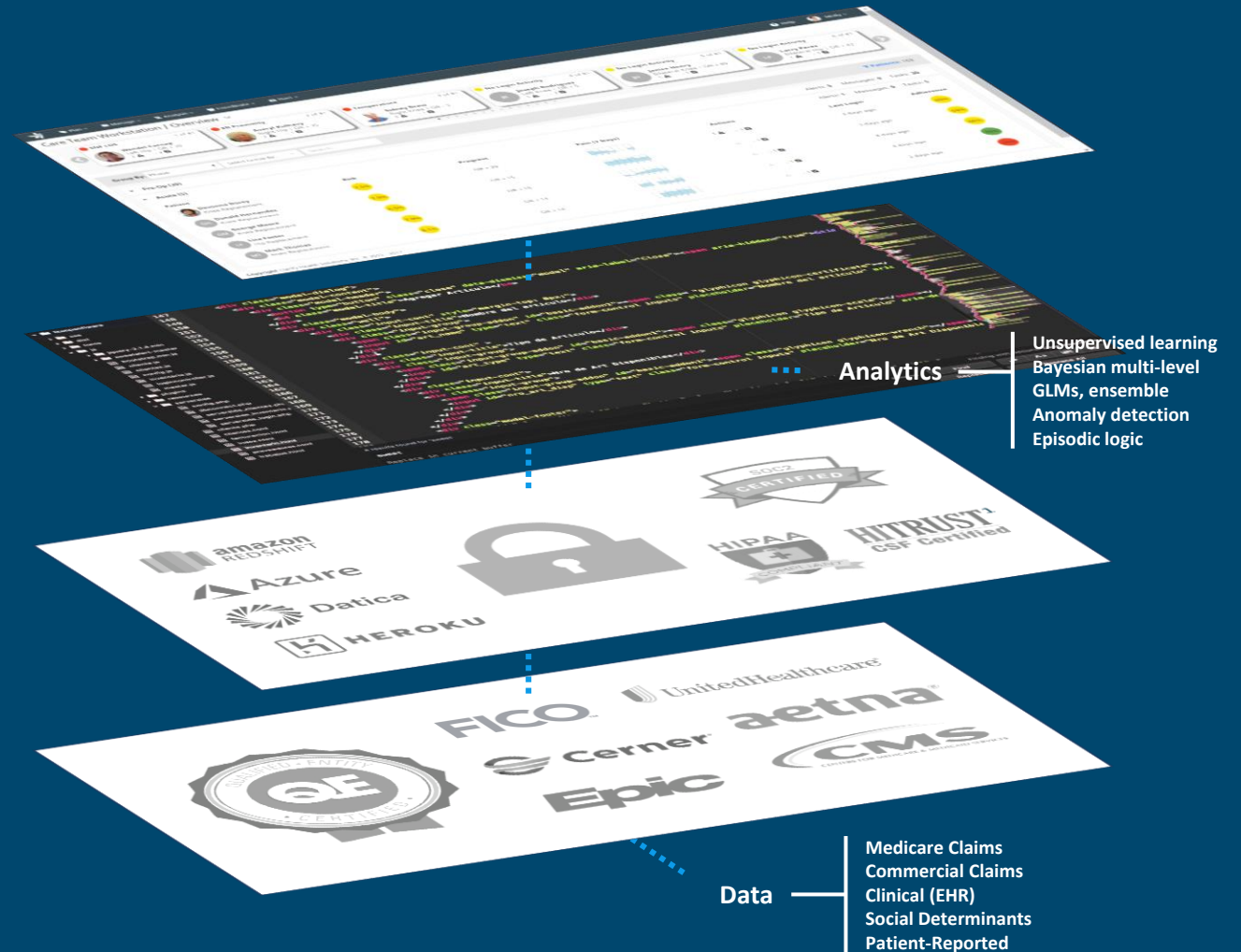
- Speed, granularity, actionability
- 24/7 access to rich, intuitive visualizations, external benchmarks, and configurable dashboards
- Most advanced case-mix adjustment, precise clinical analytics, and care journey personalization

Trusted security standards

- HIPAA-compliant, best-in-class data handling and storage methodology
- Highest levels of ongoing certification & environment monitoring (SAE16 SOC2 and HITRUST)

Cutting edge architecture

- Financial services portfolio accounting cloud and data lake approach translated to patient-level data set integration and analytics
- Algorithmic layers to automate picking, cleaning, and manipulation of data
- Delivers rich, real-time insights via novel linkage of data



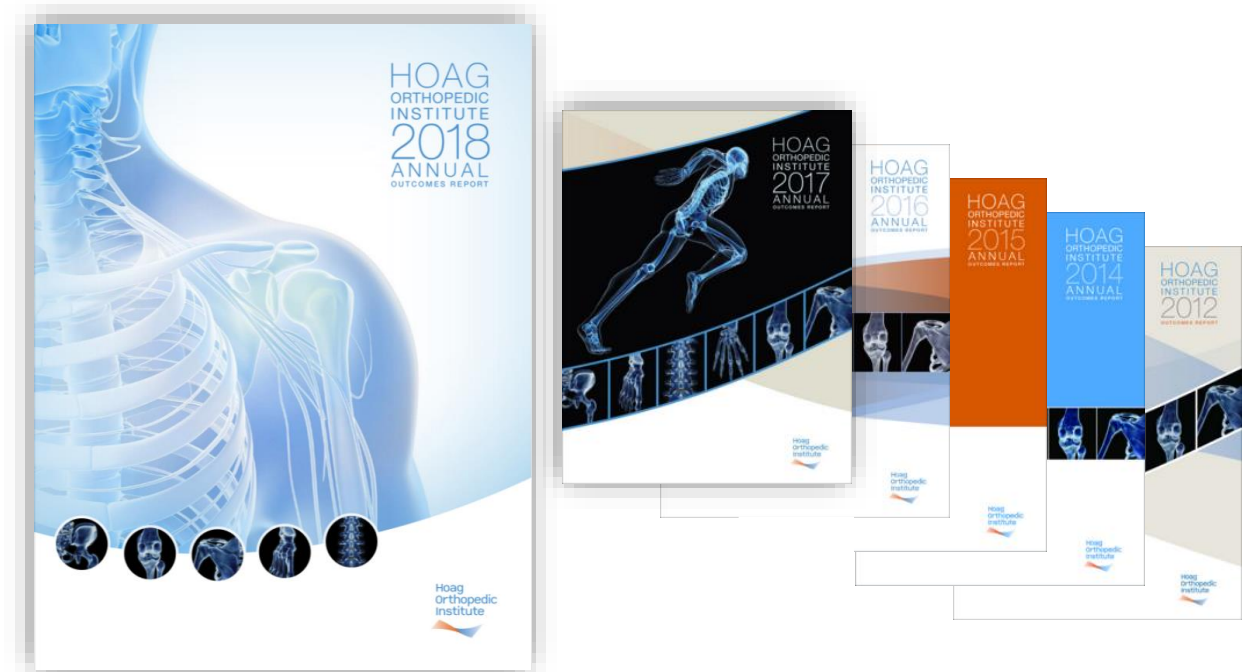
Three tier architecture allows for efficient communication of data across tiers

Tier	Platform(s)	Host	Language(s)	Output
Visualization & Standardization	<ul style="list-style-type: none">• Desktop (browser)• iOS (mobile)• Android (mobile)	<ul style="list-style-type: none">• Datica	<ul style="list-style-type: none">• JavaScript• HTML5• Swift (iOS)• Java (Android)	<ul style="list-style-type: none">• Provides delightful UI to customers• Shares user-generated data to integration tier
Benchmarking Analytics	<ul style="list-style-type: none">• Node.js• LoopBack• Redis	<ul style="list-style-type: none">• Datica	<ul style="list-style-type: none">• JavaScript• Python	<ul style="list-style-type: none">• Moves data between data tier and presentation tier• Integrates with external systems<ul style="list-style-type: none">• EHR (FHIR/HLT)• 3rd parties (PIPL, FICO)• Others, as needed
Data & Pre-Processing	<ul style="list-style-type: none">• PostgreSQL• Amazon Redshift	<ul style="list-style-type: none">• Datica• AWS	<ul style="list-style-type: none">• SQL• R• Python	<ul style="list-style-type: none">• Stores raw claims files• Generates patient timelines and episodes• Provides most of Prism calculations

So, what does this look like in practice?

Analytics in Practice

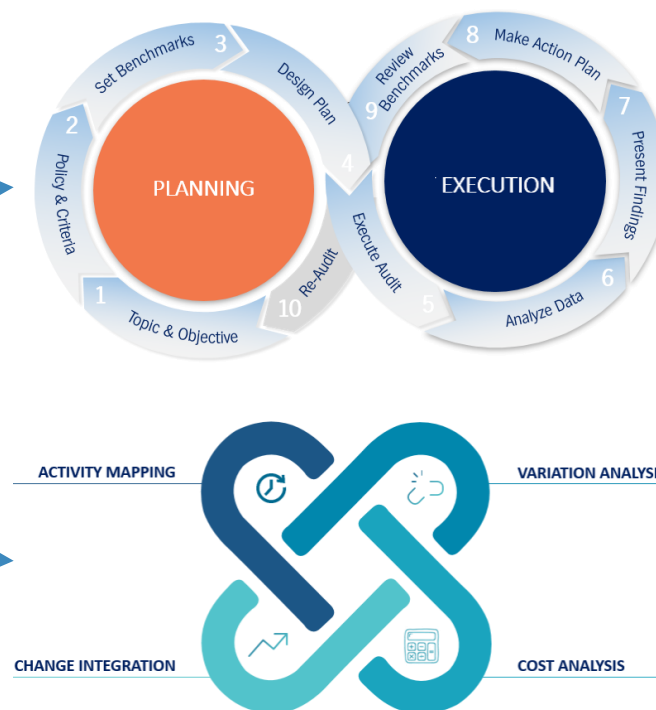
Jay Patel, MD MS
Medical Director Data and Registry Initiatives
Hoag Orthopedic Institute





Thesis

When physicians and health care delivery systems are armed with analytics, value will be generated by shifting population management from payors towards providers.



THEORY

PRACTICE

HOI Culture of Value

- Performance Improvement Committee
- Quality Committee
- Bundle Committee
- Outcomes Directors
- Surgeon Dashboards
- Research/Education

Outcomes Manual

Strategic Partnerships with Analytics Companies



Sopida Andronaco

HOI Director of Performance
Improvement and Clinical Outcomes

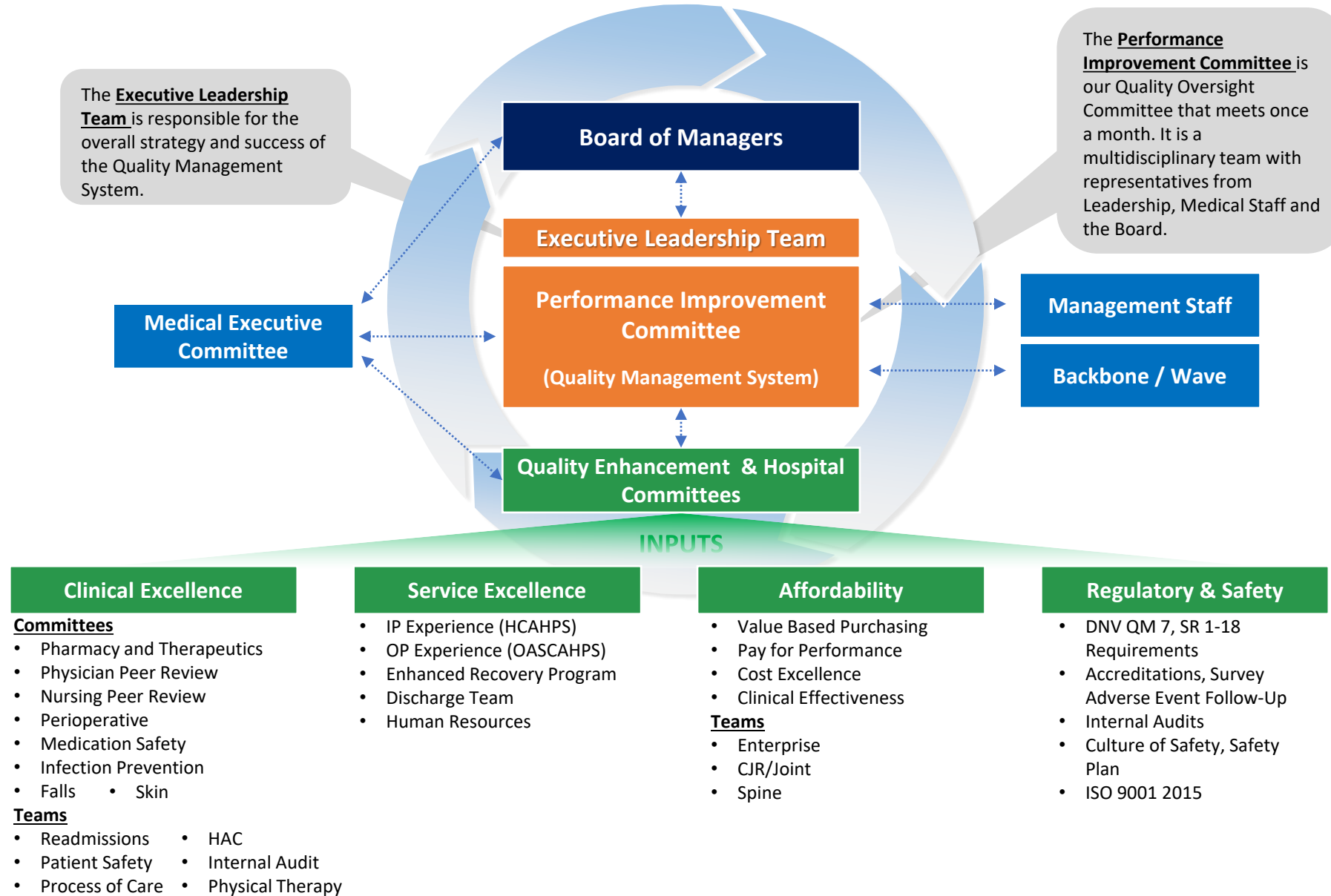
Sean Guerrero

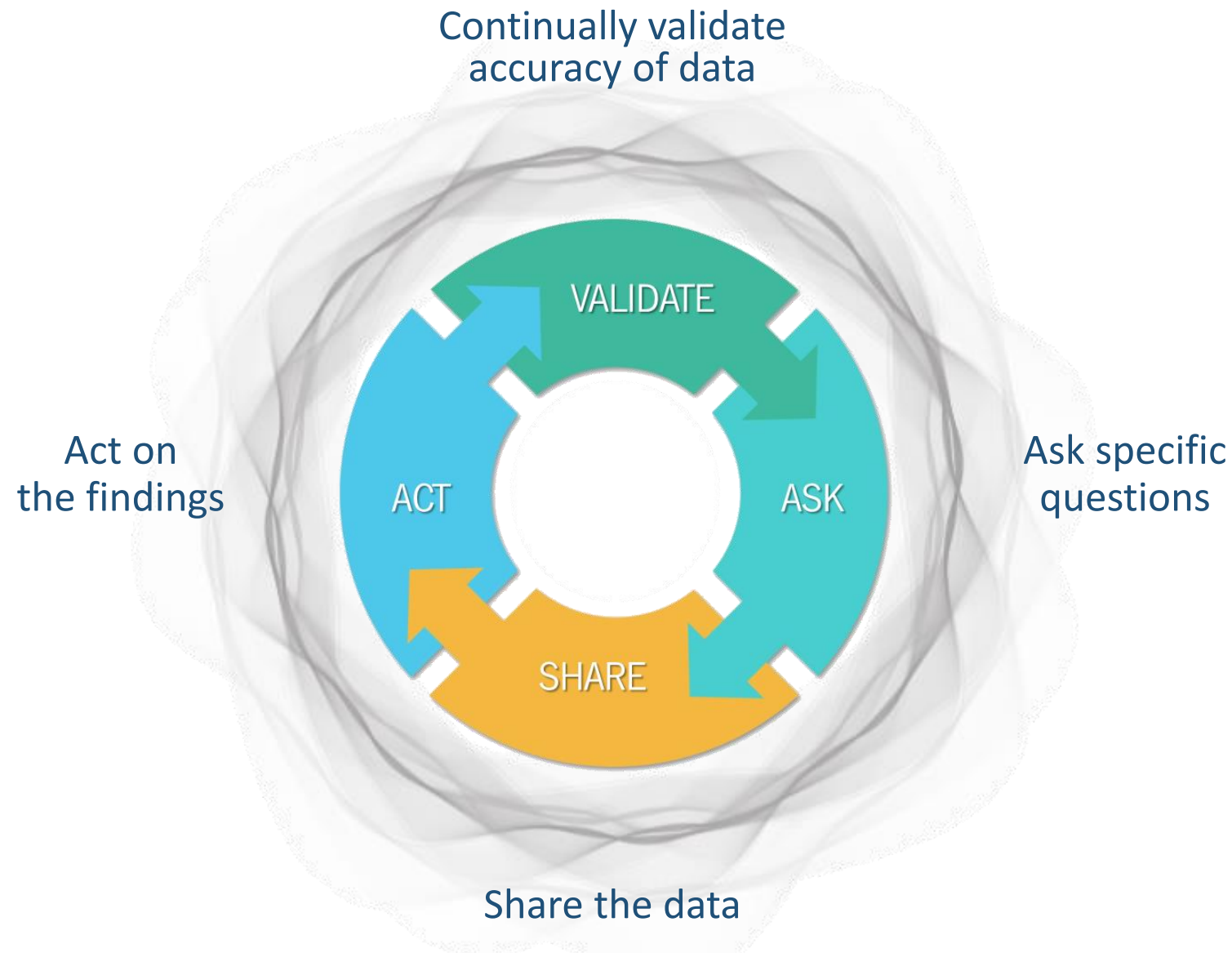
HOI Project Manager

Sarah Chen MD

Clarify Health VP of Clinical
Transformation







Surgical



Organizational



County-Level

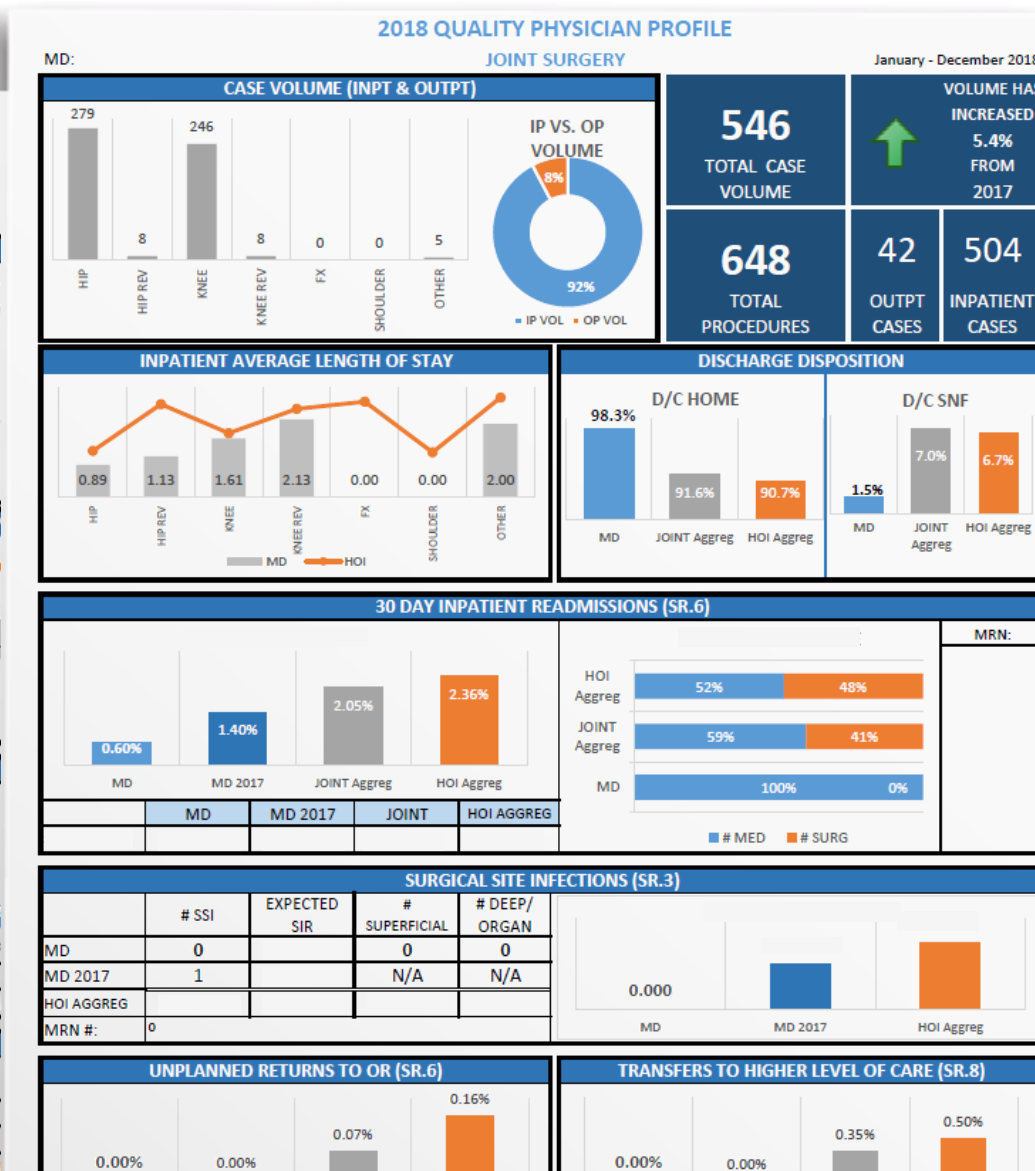


State-Level

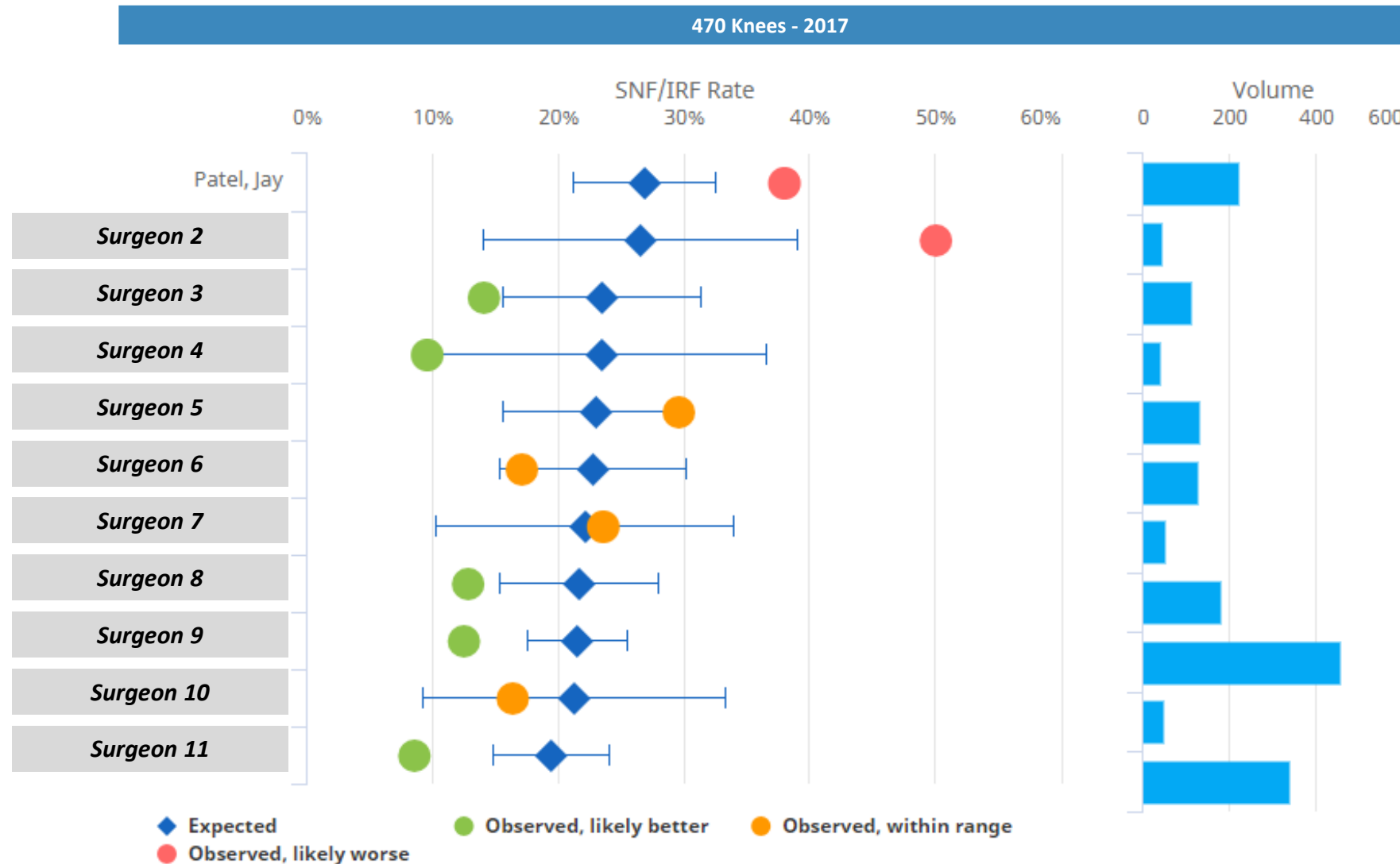


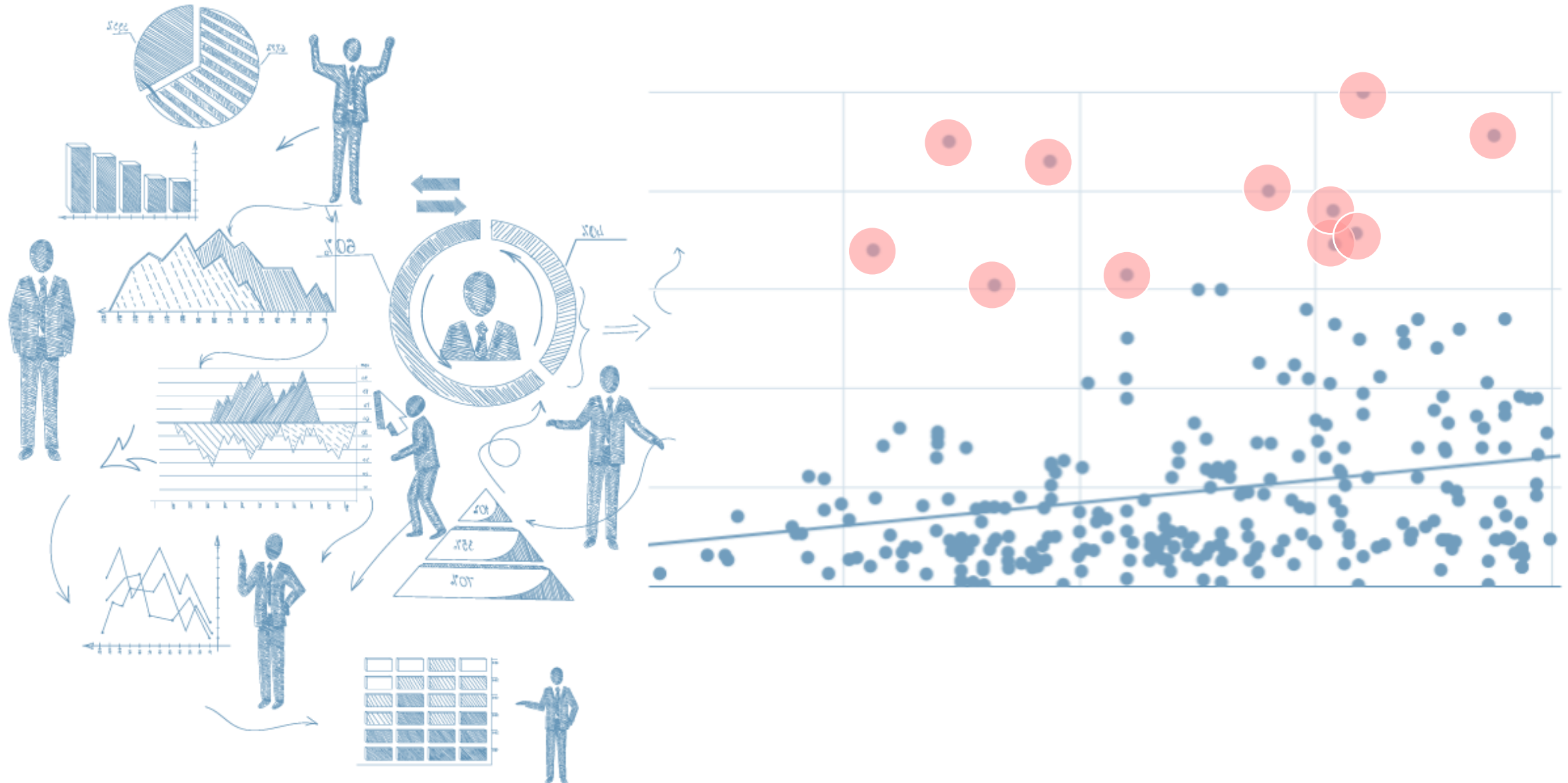
Western United States





Variation in PAC utilization varies amongst surgeons

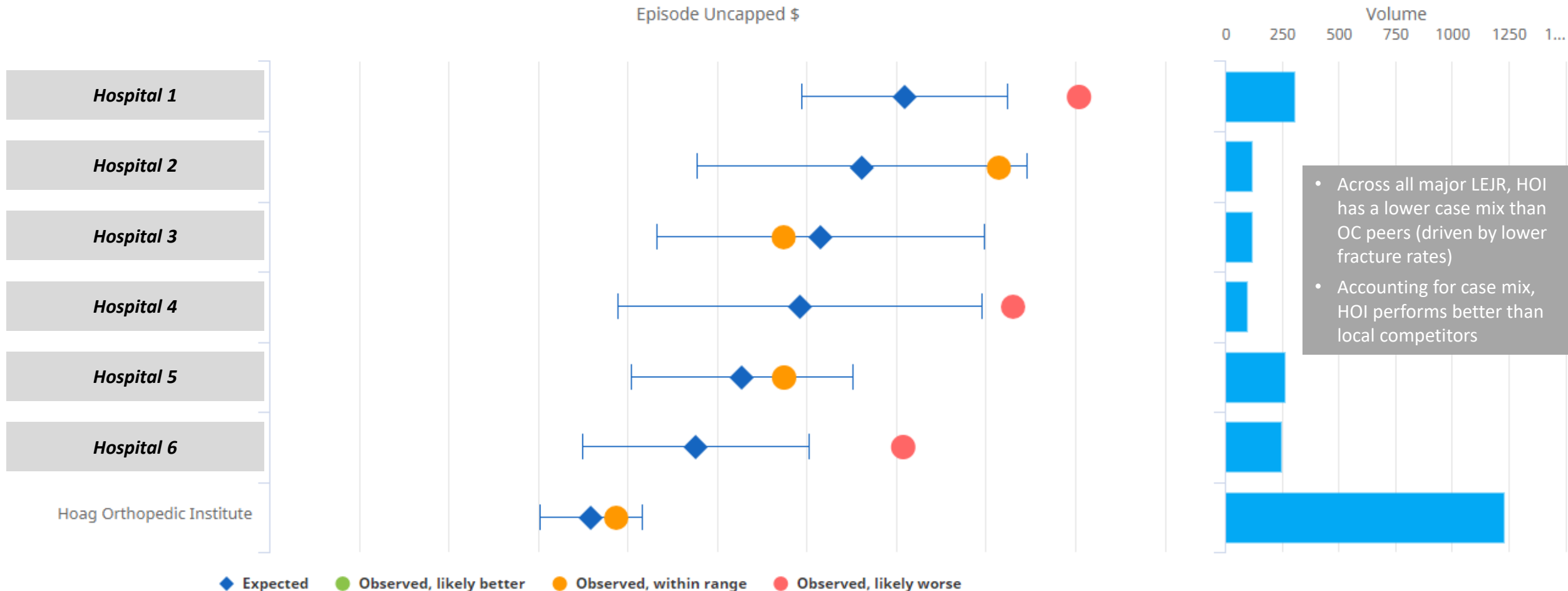




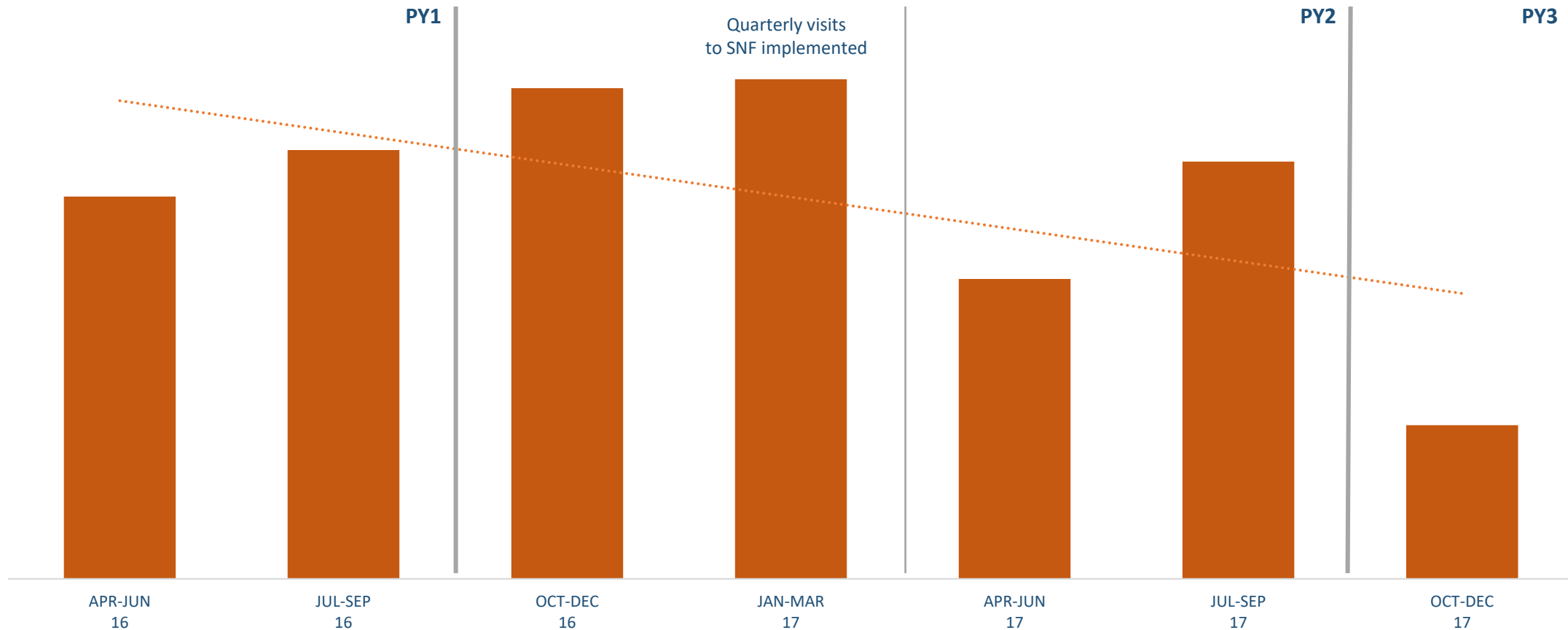
Growing from our experience in surgeon and hospital level data, we can also use analytics to measure how well we are collectively taking care of the Orange County Population

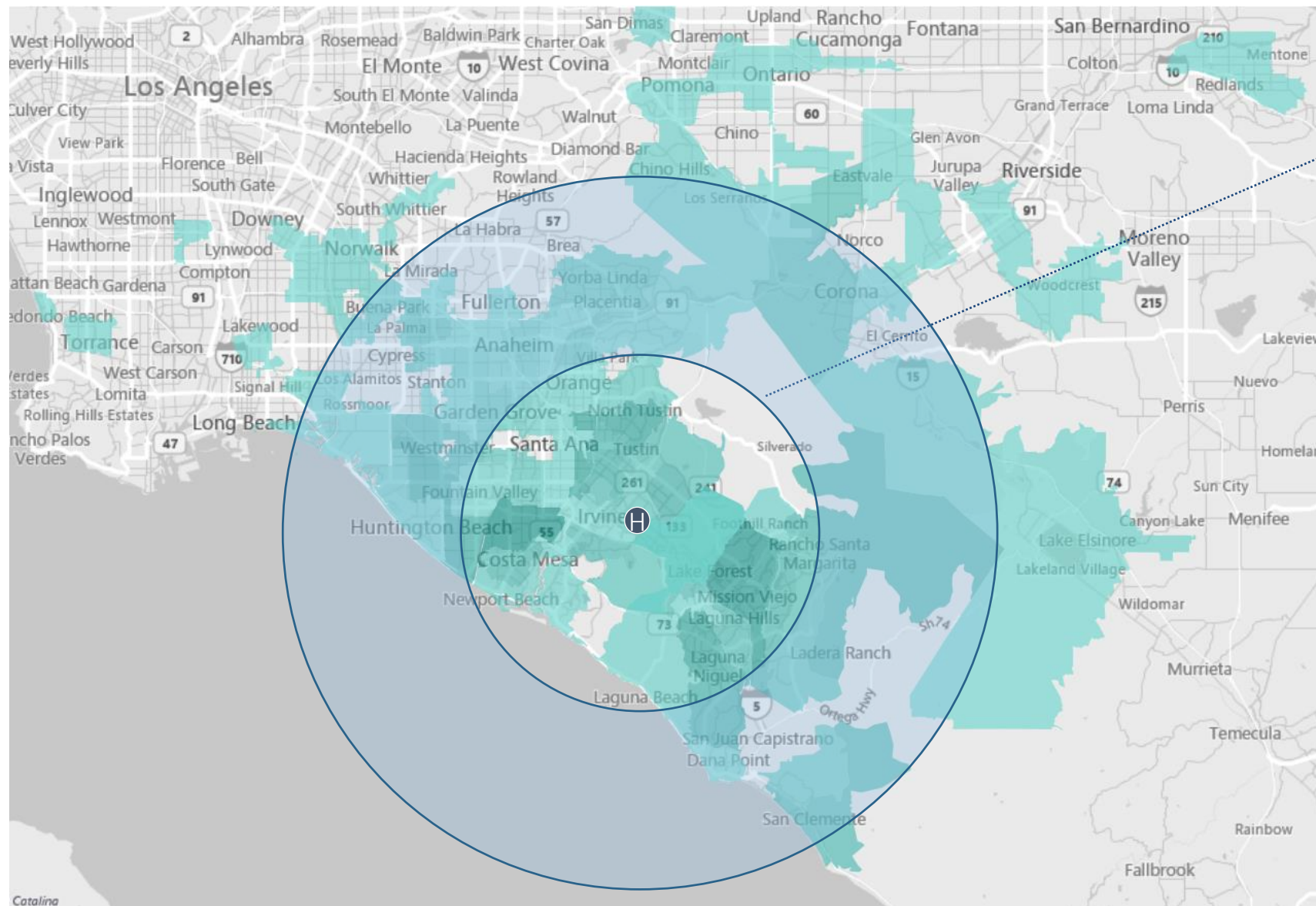


Across all major LEJR volume, HOI performs better than several OC peers



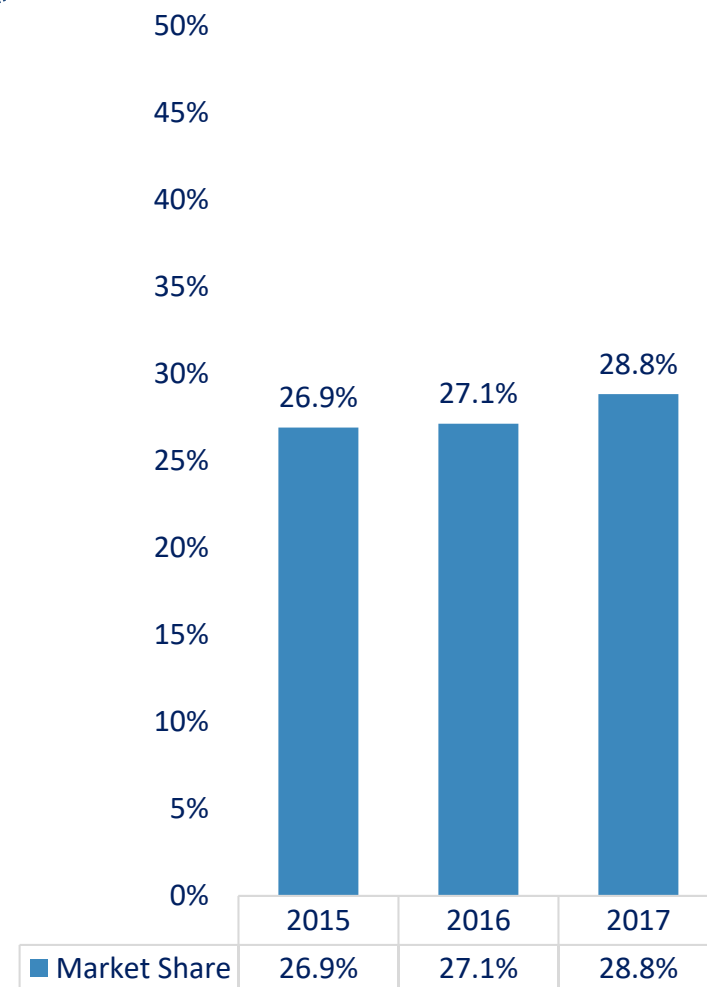
Overall Skilled Nursing Facility Cost & Average Length of Stay





Source: OSHPD 2015/2017

Market Share Secondary Service Area





Musculoskeletal Value Continuum

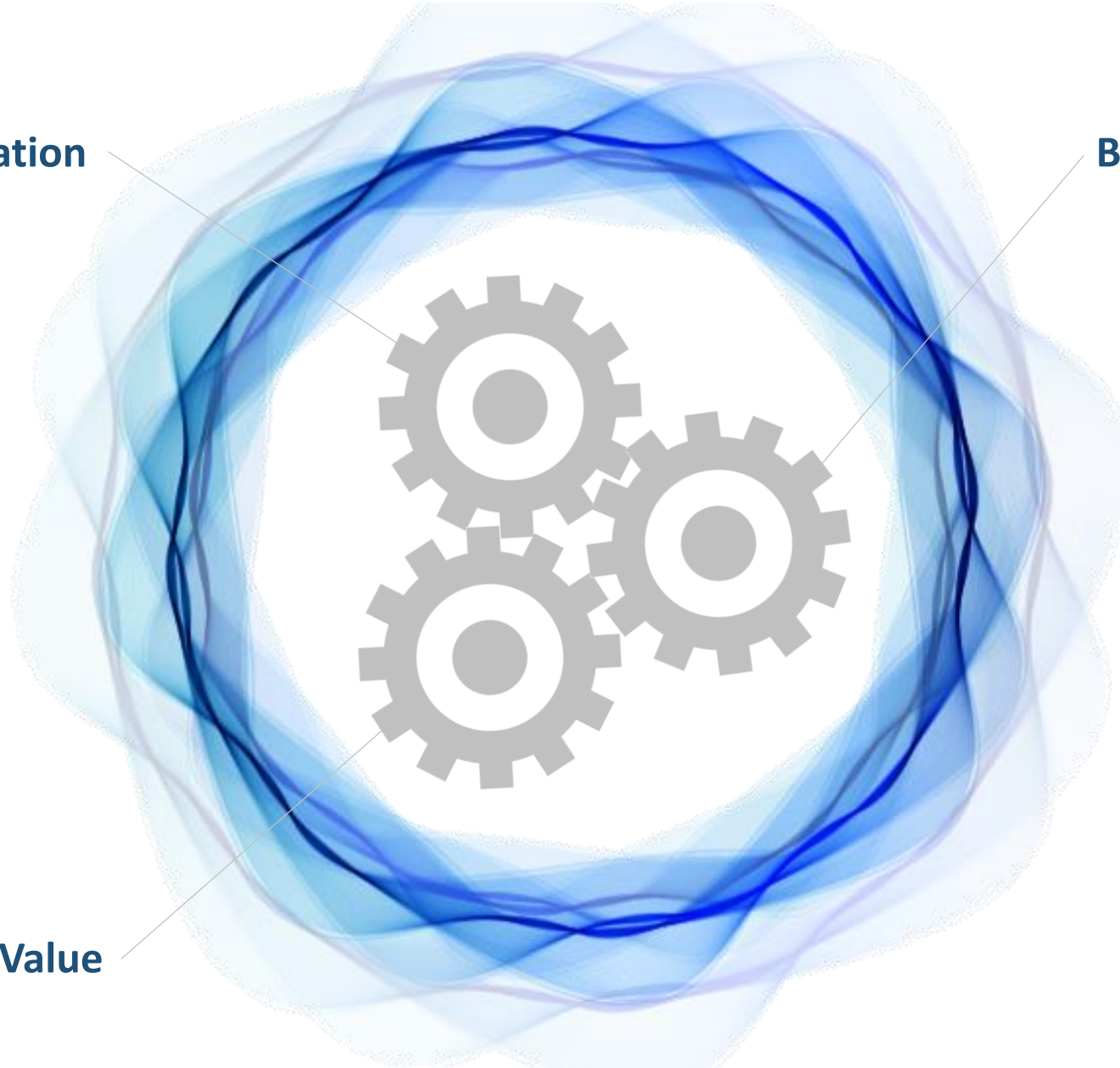


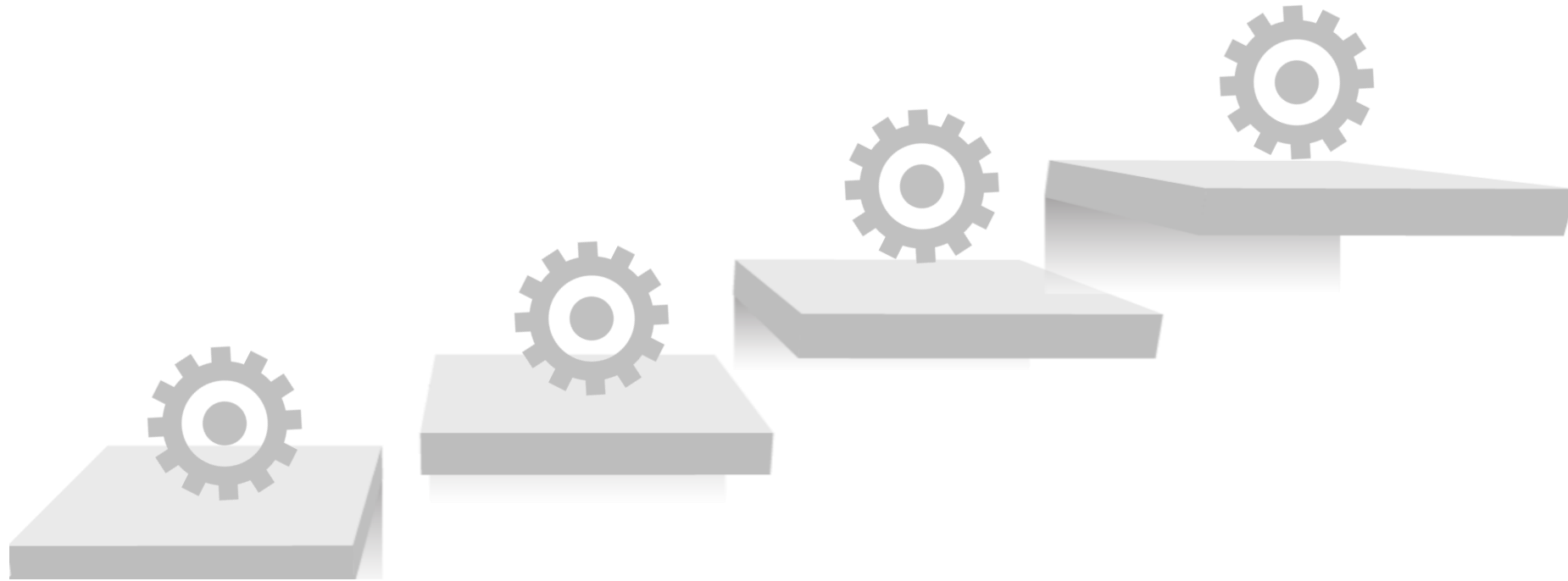
- Using analytics, we continue to develop value in the surgical and post operative episodes.
- Still need to optimize value in the diagnostic, conservative treatment, and preoperative evaluation aspects of care

Identify Target Population

Build Infrastructure

Optimize Value





- Incorporate additional data sets to create risk adjusted predictive models for entire continuum of care
- Optimize the value between regionalizing care and providing sufficient access to care
- Improve value in preoperative and nonoperative management
- Identify populations (regions, insurance networks, employers) where we can add value

Quality & Outcomes in the new world order: reimagine the patient experience



Activate patients in their own care journey, empower them, and track them in real-time



Stratify patient risk dynamically

Patient profiles with 200+ risk factors, including social determinants

EA

Aaftio, Eldridge
DOB: Dec 31, 1950
Age: 67

Birth Gender: Male
MRN:

Home: BRONX, NY
Marital Status: unknown
Ethnicity: White

Timeline

History

Episodes

Journey

Profile

Ratings

Ratings

Disposition	Initial Rating	Current Rating	
Complete regular check-ins	N/A	N/A	Details

Outcomes

Initial Rating	Current Rating		
Quality			
Risk of Post Acute Admission	⚠️ 12.9%	❗ 50.1%	Details

Billing and Cost

Likelihood of PAC	⚠️ 19.1%	❗ 44.1%	Details
Episode cost estimate	⚠️ \$19,393	❗ \$51,714	Details

Factors

Cohorts

Timeline

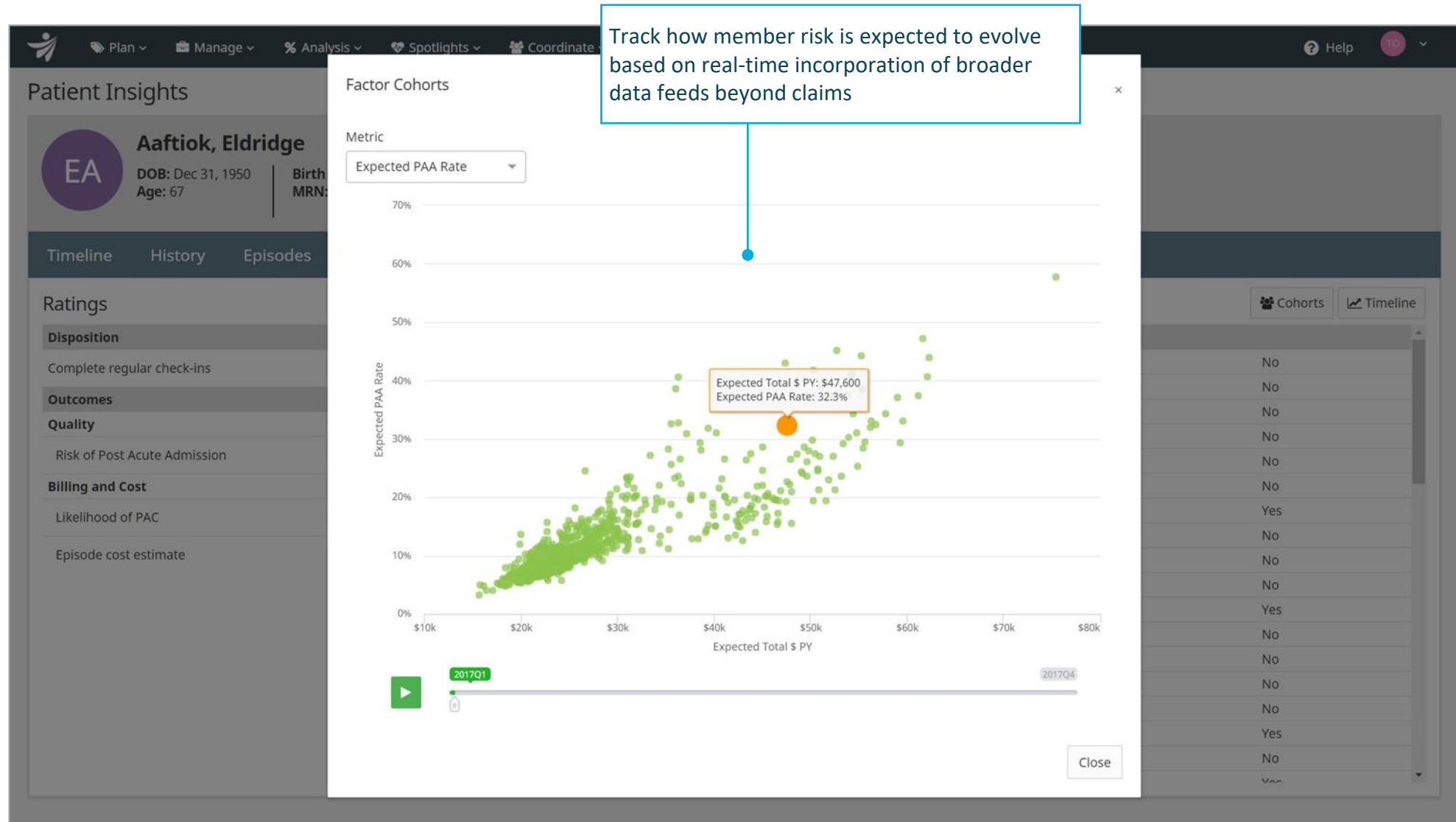
Clinical	
Admit from SNF: True	No
Aids HIV: True	No
Alcohol Abuse: True	No
Blood Loss Anemia: True	No
Cardiac Arrhythmias: True	No
Chronic Pulmonary Disease: True	No
Coagulopathy: True	Yes
Congestive Heart Failure: True	No
Deficiency Anemia: True	No
Depression: True	No
Diabetes Complicated: True	Yes
Diabetes Uncomplicated: True	No
Drug Abuse: True	No
Fluid And Electrolyte Disorders: True	No
Hip Fracture: True	No
Hypertension Complicated: True	Yes
Hypertension Uncomplicated: True	No
Hyperuricemia: True	Yes

Stratify and track member risk in real-time for cost, quality, and outcomes

Comprehensive personal member profiles comprise 200+ risk factors– clinical, social, and demographic

Assess progression of patient risk

Understand how high and rising risk patient needs are evolving



Understand factors driving risk changes

Track relevant demographic, social, and clinical factors dynamically affecting risk to optimize clinical programs and interventions



REAL-TIME *CARE TRAFFIC CONTROL* PULLS IT ALL
TOGETHER



Real-time care navigation

Focus on the patients that most need an intervention

Quickly review patient panel, grouped by factors like risk level and care journey stage

Prioritize patients requiring intervention, based on the impact of the intervention

See overview of each patient's reported information

Prioritize actions needed per patient

The interface displays a 'Care Team Workstation / Overview' section with a horizontal scroll of patient panels. Each panel shows a patient's name, photo, and key metrics. Below this is a filter section with 'Group By: Phase' and a search bar. The main table lists patients under 'Pre-Op (29)' and 'Acute (5)' categories, with columns for Patient, Risk, Progress, Pain (7 Days), Actions, Last Login, and Adherence.

Patient	Risk	Progress	Pain (7 Days)	Actions	Last Login	Adherence
Devonna Dorey Knee Replacement	7.5%	OR + 29		1 0 1	3 days ago	65%
Donald Hernandez Knee Replacement	7.0%	OR + 15		0 0 1	3 days ago	69%
George Moore Knee Replacement	6.5%	OR + 15		0 0 1	4 days ago	66%
Lisa Foster Hip Replacement	7.0%	OR + 14		0 0 1	4 days ago	76%
Mark Thomas Knee Replacement	8.1%	OR + 14		0 0 1	2 days ago	34%

Thank you



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