

Top-ranked heart center implements multiple initiatives to improve patient care and cardiovascular performance.

While tackling three Percutaneous Coronary Intervention (PCI) improvement initiatives, renowned cardiology department experiences significant and measurable gains – and sustains performance over four years.

Challenge

At most large health systems taking on one cardiovascular performance initiative is considered difficult and challenging, but what about tackling multiple initiatives at once?

That was the choice facing a world-renown interventional cardiology department serving a large metropolitan area. Even though they're a nationally ranked health system, and were competitive in the marketplace, senior leadership knew that multiple opportunities existed to improve cardiovascular service line performance.

They also knew from experience that if executed properly the success from one project would likely generate additional quality and financial value for other interrelated initiatives. With this blueprint in mind, the health system proceeded forward.

Experience is critical to success

Anxious to get started, the client partnered with Biome Analytics, a leading provider of clinical performance solutions for enterprise heart centers and cardiovascular teams.

Biome has a long history identifying, building, and managing complex performance initiatives that require cross-functional participation, align-

ment and management within the CVSL. Not everyone can repeatedly deliver outcomes and value, especially for multiple initiatives over time, yet Biome can.

The Biome client engagement includes the following:

- Biome provides care teams with analytics and a shared knowledge network of protocols that help identify best performing providers within the CVSL.
- Biome embeds these protocols in a powerful, proprietary suite of clinical performance applications that are continually reviewed for additional improvement opportunities.
- Biome's technology allows for the development of patient sub-cohorts and risk adjustment drill downs on actionable root causes so care teams can align around a common fact base and create plans of action for initiative management.
- Biome tracks each improvement initiative as a unique "signature" across digital platforms which enables streamlined communication and allows for ongoing performance measurement.

> CHALLENGE

Manage multiple clinical and financial performance improvement initiatives at the same time while sustaining gains YoY:

- PCI – Radial / Femoral Access
- PCI – Acute Kidney Injury
- PCI – Mortality

> SOLUTION

- Biome Opportunity Engine™
- Biome Knowledge Network™
- Biome Analytic Engine™

> RESULTS

- Radial access increased 110% to 73% of all qualifying patients
- PCI AKI OER improved 42% to .72
- PCI mortality OER improved 44% to .77
- Improved results were achieved in safety end points
- Improved results were achieved in enterprise metrics: LOS, ICU bed capacity, readmissions

- Biome regularly synthesizes new data and updates the clinical performance applications so new information and analytics can be shared with care teams.

Identifying opportunities

Leveraging the Biome Opportunity Engine™ — a cardiovascular performance application with proprietary machine learning algorithms — Biome analyzed a large volume of enterprise system data to automatically identify and rank hundreds of possible clinical and financial improvement opportunities.

Working closely with the service line executive director of heart and vascular institute, Biome then ranked a dozen opportunities, each of which would significantly impact the cardiovascular program. Ultimately, the client focused on the top three:

- PCI – Radial / Femoral Access
- PCI – Acute Kidney Injury
- PCI – Mortality

With each new initiative, the interventional cardiology department leveraged Biome’s Knowledge Network™ — a library that connects tens of thousands of clinical and financial measures, metadata, benchmarks, transform rules, decision trees and predictive algorithms into a proprietary ontology – to assist clinical leadership in creating precise plans-of-action, including recommendations, insights and proven best practices to help the care teams focus on activities and care pathway modifications which would have the greatest impact on success.

Opportunity #1: PCI – Radial vs. Femoral Artery

Migrating patients from femoral access to radial access presented significant opportunities to reduce the cost of care, improve outcomes, and increase patient satisfaction. The initiative started with profiling physician practices, establishing patient risk

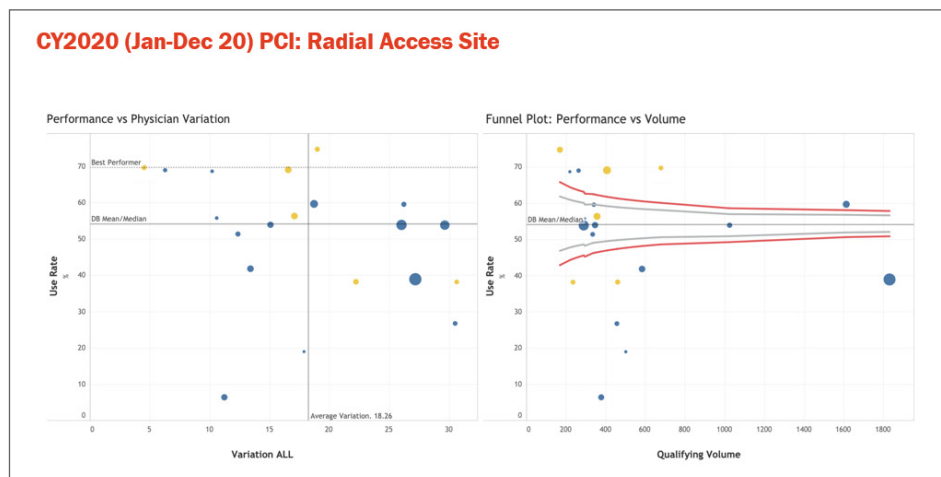


Figure 1.

profiles, and then identifying candidate patients who qualified for radial access vs femoral access.

The care team put in place a shared knowledge strategy which allowed practitioners with higher percentages of radial access to share best practices with the entire clinical team. The shift in access site approach from femoral to radial in low-risk cases allows patients to ambulate quicker after their procedure and creates the potential for same day discharge.

The YoY results were immediate and sustainable:

- Reduction in femoral access from 65% to 27%
- Cost savings/case (avg): \$2,000/case
- Contribution margin impact: +\$536,000

Opportunity #2: PCI – AKI

Acute kidney injury (AKI) is an all too common in-hospital-complication, especially in older adults. In 2018, the health system had a PCI AKI OER rate of 1.24, above the national benchmark and with an opportunity for further improvement.

Biome assisted the care teams by managing every aspect of the improvement initiative, starting with the

“We invest a significant amount of enterprise resources in the aggregation and collection of clinical data,” said the executive director of heart and vascular. “Biome helps us derive more value from these investments. They develop intelligence we can action from a combination of our data and their data, and this has lead to significant improvement in our care teams performance over time.”

technology and applications required to streamlined communications and measure performance over time.

Next, Biome helped align the care teams around a common fact base and establish best practice protocols based on a combination of the service line’s best performing providers and Biome proprietary published risk models. These were then embedded in the performance improvement application and were continually reviewed for further improvement potential. Care team members were routinely updated on progress.

As a result of these efforts, AKI OER improved 42% to 0.72, a significant improvement against the national benchmark.

Opportunity #3: PCI – Mortality

The health system had a PCI mortality OER above the national benchmark. Leveraging the Biome Analytic Engine™, the client was able to quickly respond to improvement opportunities from all parts of the service line. The investments being made in two of the improvement initiatives, Radial/Femoral Access and AKI, along with a commitment to Biome driven detailed quarterly data reviews of clinical outcomes lead to continual improvements in observed performance.

Additionally, Biome identified opportunities to improve the expected performance component of the metric by correctly reflecting patient risks in department documentation. It was determined that several patient cohorts, specifically those with highly complex combination procedures performed within their admission, were significant contributors to the under-performing mortality rate.

By continually driving improvements in the established service line initiatives and aligning staff around process and documentation improvement, the health system was able to reduce PCI mortality OER by more than 30% to 0.95, well below national average. Three years later, the mortality has improved even further to 0.77.

More initiatives – faster gains

For four years in a row, Biome helped this cardiovascular team build upon the experience of our industry-leading clients to accelerate improvement, manage more initiatives at a lower cost, and institutionalize best practice delivery using clinically defensible evidence based on their data.

Not only did they realize significant value in the intended initiatives, the enterprise health system saw improvements in LOS, readmissions, and ICU bed days saved.

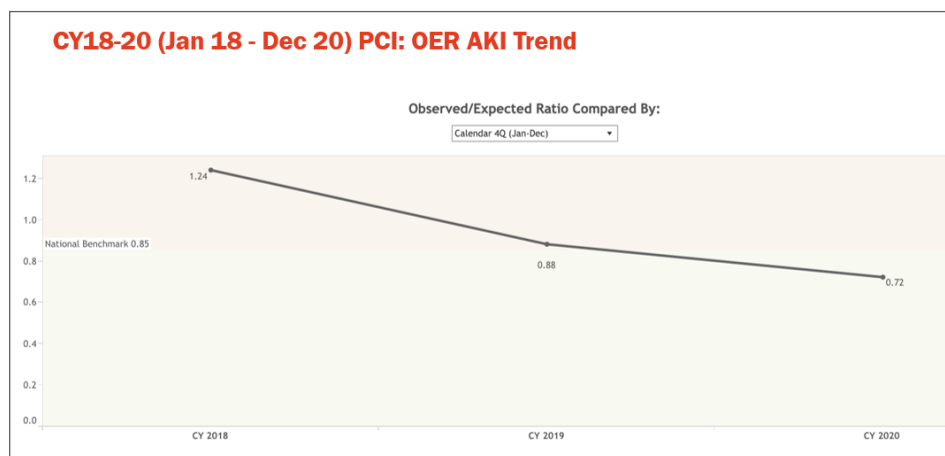


Figure 2.

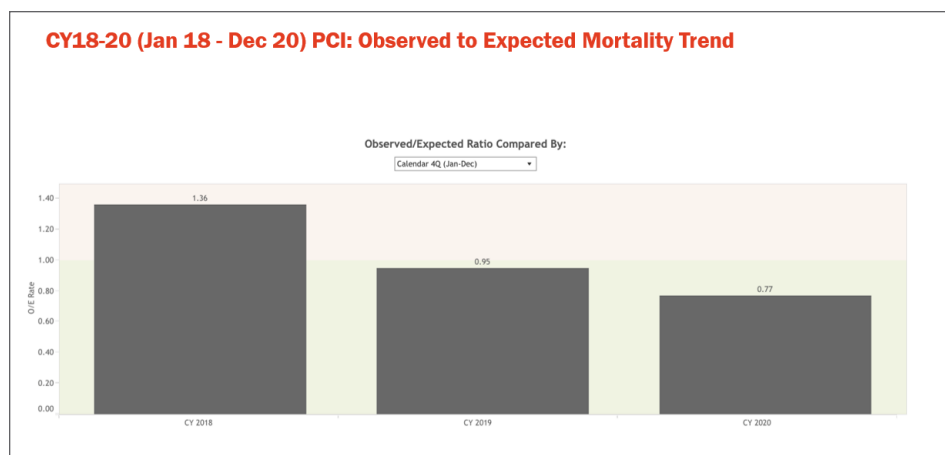


Figure 3.

Biome makes it easy for clients to take on one performance initiative at a time — or tackle multiple opportunities once.

“There are many benefits of working on multiple initiatives at the same time,” recalled the executive director of heart and vascular. “We learned that improvement in one initiative generates quality and financial value on its own. But most measures are inter-related, and success in one typically translates to improvement in other important financial and quality metrics.”

About Biome

Biome is the leading cardiovascular performance company dedicated to helping doctors and health systems deliver the best care, to the most patients, at the lowest cost. Biome partners with ambitious enterprise heart centers and cardiovascular teams looking to achieve superior clinical and financial performance.

Biome Analytics

1160 Battery Street East
Suite 100
San Francisco, CA 94111
info@biome.io
+ 888 246 6330