



## **10 Healthcare Analytics Projects with Real Results**

How You Can Successfully Implement Analytics  
to Gain Quantifiable Outcomes



## Table of Contents

Introduction .....	3
<b>Project #1:</b> Decreasing readmissions among newborns.....	4
<b>Project #2:</b> Improving throughput in the emergency department.....	5
<b>Project #3:</b> Decreasing antimicrobial usage in the hospital .....	6
<b>Project #4:</b> Gaining insight into drug effectiveness to reduce costs and improve care.....	7
<b>Project #5:</b> Saving the lives of cardiac patients .....	9
<b>Project #6:</b> Reducing provider burnout through more reliable staffing.....	10
<b>Project #7:</b> Automating accreditation of new breast cancer center.....	11
<b>Project #8:</b> Improving treatment of diabetes patients .....	12
<b>Project #9:</b> Improving patient safety scores .....	13
<b>Project #10:</b> Providing physicians with real-time data to improve their practices .....	14

## Introduction

Healthcare organizations know there's value in data and value in analyzing it. But many times, they don't know how to practically implement analytics in their organizations to make real change.

In a recent HIMSS Analytics survey, sponsored by Dimensional Insight®, 92.7% of senior healthcare leaders surveyed said their organization has an analytics strategy in place. But less than one-third have actually been executing on that strategy for some time.

Furthermore, while two-thirds of organizations have an executive dashboard to support strategic decision-making, only one-third of those that have a dashboard use it on a daily basis to make decisions. That means that in aggregate, less than 1 in 4 healthcare organizations leverages its data at an executive level daily.

So how do you move from theory to practice when it comes to analytics? It can be a journey, so it's important to take it one step at a time.

That's what this guide is here for. It contains 10 projects that you can emulate at your organization to drive real results as a result of analytics. You'll learn about how healthcare organizations just like yours implemented these projects using Dimensional Insight's Diver® Platform and related applications, and you'll learn about the quantifiable outcomes they achieved as a result.

My hope is that these stories will inspire you to create similar projects at your organization so you can improve employee engagement, reduce costs, and ultimately, provide better patient care.

### **Kathy Sucich**

*VP of Marketing*

*Dimensional Insight*

## Project #1: Decreasing readmissions among newborns

No one wants to go back to the hospital after being discharged, least of all new parents with their baby. Yet data published in *Pediatrics* shows that at one large healthcare system, 1.8% of newborns were readmitted within 28 days of discharge. Of these babies, 41% had feeding problems, 35% had jaundice, and 33% had respiratory distress.

Munson Healthcare, based in Northern Michigan, wanted to decrease the number of newborn readmits in its Women & Children’s department. It turned to analytics to help provide new insight that would help it address the problem.

### How Munson Healthcare did it

Munson used Dimensional Insight’s Diver Platform to help it investigate data from the Women & Children’s department. With Diver, Munson ingested data from its several EHRs (Cerner, MEDITECH, and others) and was able to see which issues were bringing babies back to the hospital after discharge.

Mary Schubert, executive director of the Women & Children’s department, noticed in Diver that several newborns were being readmitted for hyperbilirubinemia (jaundice). As a result, she worked with others in the department to understand the root causes. Were mothers learning how to feed their babies correctly? Were some babies being discharged too early? Once staff members investigated the reasons, they could then take steps to make process changes.

According to Schubert, the data in Diver served as a starting point. “We started by saying, OK, here’s the readmit rate, identifying some of the causes, and then working on them. There’s really a process flow to it in which you get the data, you watch that data, and you trend it. Diver has been very helpful in this regard.”



24% reduction in newborn readmissions

### The results

Once Munson started to make a concerted effort to work with pediatricians and nursing staff around hyperbilirubinemia, the number of readmissions started to go down. The decrease in the hyperbilirubinemia readmits was part of the overall reduction of readmits in the department by 24% in two years.

“For us, compared to the grand scheme of things for system-wide readmits, we are a very small part, but for a family to take a newborn baby home and then have to come back, it’s a huge deal,” says Schubert. “From the patient experience perspective, nobody wants to have to come back to the hospital after their baby is born. It’s scary. And it’s potentially life-altering. So having this information at our fingertips has been a huge help.”

## Project #2: Improving throughput in the emergency department

Bottlenecks in a hospital’s emergency department (ED) have a profound impact not only on patient care, but also on patient satisfaction and hospital revenues. It’s critical for hospitals to move patients through the ED quickly and efficiently.

Henry Mayo Newhall Memorial Hospital, based in Valencia, Calif., about 35 miles northwest of Los Angeles, wanted to improve the patient flow in its ED. It decided to embark on this project as it deployed a new MEDITECH emergency department management (EDM) application, and it turned to analytics to help out.

### How Henry Mayo Newhall Memorial Hospital did it

Henry Mayo worked with Dimensional Insight to extract patient workflow data from its EDM, build data models, and create dashboards and scorecards to track results against targets and key performance indicators (KPIs).

On the Diver dashboard, Henry Mayo’s management team can see how long patients spend in the ED, as well as the time breakdown for each step in the ED flow. As a result of the increased visibility, Henry Mayo has been able to refine workflow processes and better understand compliance. For example, Diver initially identified a long delay from the time the patient entered the ED to the time he or she saw a doctor. This led to a high percentage of patients leaving the ED before seeing a physician. Henry Mayo then added a checkpoint to the nursing workflow and refined procedures to further rapidly identify bottlenecks in the flow of patients through the department.

Henry Mayo now has a comprehensive and timely view of ED performance, throughput, utilization, and efficiency. Different measures track end-to-end patient workflow, from the door-to-triage, to being seen by a doctor, to decision to admit, to clean room available, to transport to an inpatient room. Managers can easily identify trends and exceptions, as well as quickly spot measures that require attention, dive into the underlying details, and initiate improvement actions.



### The results

With Diver, Henry Mayo has reduced ED wait times in the following areas:

- Door-to-triage: 80% decrease
- Triage-to-room: 60% decrease
- Room-to-physician exam: 63% decrease

The hospital has also reduced by 83% the number of patients leaving the ED without being seen. That has translated into an additional \$2 million per year in ED revenues.



Door-to-triage: 80% decrease

## Project #3: Decreasing antimicrobial usage in the hospital

We've all heard about the dangers of over-prescribing antibiotics, especially as it relates to the development of "super" strains of bacteria. This can be especially harmful in hospitals, as patients already have compromised immune systems. In addition, overprescribing antimicrobials can prove costly to health systems.

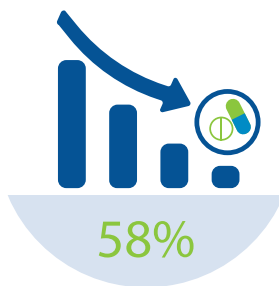
EvergreenHealth, based in Kirkland, Wash., about 15 miles outside of Seattle, is required to report its antimicrobial numbers to the Centers for Disease Control (CDC) and the Washington State Hospital Association (WSHA). Once this issue was brought to the forefront, the hospital wanted to figure out ways to improve its antimicrobial numbers in order to improve patient care and reduce costs.

### How EvergreenHealth did it

EvergreenHealth is bringing clinical data from its Cerner EHR into Diver Platform on antimicrobial usage within the hospital. With Diver, EvergreenHealth can easily meet its monthly reporting requirements to the CDC and WSHA.

In addition, the health system has an Antimicrobial Stewardship Committee that reviews the data to see where the health system can stop certain kinds of treatment or convert patients from an IV antibiotic to an oral version.

With the Diver dashboard, EvergreenHealth's administration can drill down by physician to see which providers are prescribing which medications. If necessary, administrators can then intervene to educate the physician on alternate approaches—for example, prescribing a less powerful antimicrobial.



The number of antimicrobial treatment days decreased by 58%

### The results

Since EvergreenHealth started this dashboard, it decreased the average number of treatment days for its antimicrobials from 92 days per 1,000 patient days to 39 days per 1,000 patient days, a 58% decrease.



## Project #4: Gaining insight into drug effectiveness to reduce costs and improve care

One major expense for hospitals is drugs for patients while they are being cared for. Many physicians use more expensive drugs (such as IVs over oral) because they believe they are more effective. But is that really the case?

In a volume-based world, hospitals can just bill out for these drugs. But in a value-based world, it's another story. Hospitals are often reimbursed in one lump sum per episode of care (which could be months long). Any savings in areas like pharmaceuticals will directly impact the hospital's bottom line. But of course, that can't come at the expense of patient care.

For Western Maryland Health System, drug costs are incredibly important. In the state of Maryland, the Maryland Health Services Cost Review Commission (HSCRC) sets hospital rates

and pays hospitals according to their performance on a set of quality indicators that reflect care quality and patient outcomes. Because of the way the hospital is paid, reducing costs makes an immediate positive impact on the financial well-being of the hospital.

Western Maryland had been using an IV form of acetaminophen (Ofirmev). When the drug first came on the market, it was reasonably priced. However, the company that produced it was bought out and the new drug producer raised the price by about 250% per vial. That meant Western Maryland was paying nearly \$250,000 per year for IV acetaminophen alone. The health system wanted to see if it could reduce that price by switching to oral acetaminophen, which was much less expensive. However, it didn't want to sacrifice patient care.

## How Western Maryland did it

Western Maryland used Diver Platform to examine the outcomes between patients who were given IV acetaminophen and those given the oral version. Business Intelligence Analyst Colby Lutz and Director of Pharmacy Services Surender Kanaparathi examined various surgical procedures, patient lengths of stay, and number of opiates given. They found no significant difference in patient outcomes with IV acetaminophen.

Kanaparathi shared the results with the department of surgery and senior leadership. "It was an easy sell for us because when you deal on the theory that your oral medication works as well as your IV, you don't need to spend \$35 per dose when you can get it for pennies."

Lutz and Kanaparathi also decided to examine the efficacy of other drugs. The hospital had identified a population of patients who had longer than expected lengths of stay. Kanaparathi suggested that a non-formulary drug Entereg might increase the pharmacy budget, but decrease the overall cost of care for patients with major intestinal surgeries.

The hospital tested Entereg for about six months on 30 patients, while keeping all other variables the same. Kanaparathi and Lutz were able to use Diver to analyze the results.

## The results

As a result of the acetaminophen analysis, Western Maryland sharply decreased the amount of IV acetaminophen it purchased. The hospital reduced its spending on the drug by 78% over two years, from nearly \$250,000 to just over \$55,000.

In the Entereg study, they found the patients on Entereg had shorter lengths of stay and less readmission than other patients. That resulted in a cost savings of \$112,000 over 6 months.



Reduced spending on acetaminophen by 78%  
over two years





## Project #5: Saving the lives of cardiac patients

According to the World Health Organization (WHO), 17.9 million people across the globe die each year from cardiovascular disease. Heart attacks (myocardial infarctions) and strokes are responsible for 85% of those deaths.

Hospitals are always looking for ways to reduce mortality rates among cardiac patients. In addition to improving ways of treatment, what if data could help?

Huangshi Central Hospital, based in Hubei Province in Central China, implemented Diver Platform across its organization to gain insights into clinical, financial, and operational data. It found that it could use data to improve the time it takes for a cardiac patient to be seen, and greatly reduce the mortality rate as a result.

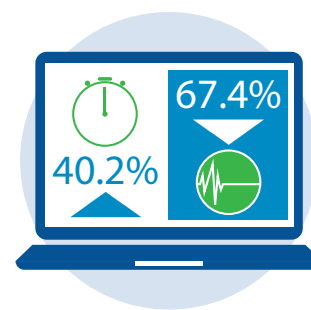
### How Huangshi Central Hospital did it

There are several key time metrics that Huangshi Central Hospital tracks when a cardiac patient is brought into the facility. Among those is the overall door-to-balloon time (D2B), which measures the time from when a patient enters the emergency department to the time a blocked artery is opened in the cath lab. Huangshi Central Hospital targeted a D2B time of less than 90 minutes.

With Diver, the hospital developed a time-tracking system enabled by RFID scanning to monitor the D2B process. It tracked seven steps along the way and aimed to improve and more tightly control each step. The Diver dashboard provided the insight that enabled hospital staff to identify ways to shorten the D2B process.

### The results

With Diver's help, Huangshi Central Hospital reduced its D2B time from 95.63 minutes to 57.19 minutes, a 40.2% improvement. As a result, the mortality rate decreased from 10.9% to 3.55%, a 67.4% reduction.



Door-to-bed improved by 40.2%  
Mortality rate decreased by 67.4%

## Project #6: Reducing provider burnout through more reliable staffing

Provider burnout is a real and growing problem. According to the Medscape National Physician Burnout, Depression & Suicide Report 2019, 44% of physicians report being burned out, with 11% reporting feeling colloquially depressed, and 4% feeling clinically depressed.

In the survey, 46% of surgeons report being burned out, and 34% of respondents say spending too many hours at work contributes most to their burnout.

These were some of the factors at play for Gwinnett Medical Center (GMC), based in suburban Atlanta, when it decided it needed a better way to predict its surgeries and more reliably schedule the shifts of its providers. The hospital believes that happy associates lead to happy patients, and it knew it had to create a better life for its providers if it wanted to retain them and reduce burnout.



### How Gwinnett Medical Center did it

While GMC schedules out most of its surgeries each day, the hospital does have a number of “add-ons” (trauma or emergent surgeries that must be done within a certain window of time), which are unpredictable. That means if the surgical unit isn’t properly staffed for these add-ons, providers are asked to stay late.

GMC is using Dimensional Insight’s Surgery Advisor™ application to help it better understand the efficiency of its surgical blocks. Are surgeries starting on time? What is the total duration of each procedure? What is the turnaround time between procedures? Can we more accurately plan for add-ons?

Surgery Advisor enables GMC to understand and predict add-ons based on the data that has already been collected. This understanding allows the hospital to more reliably staff operating rooms so it can minimize the number of times associates are asked to stay at the last minute.

In addition, the surgery team can examine start times and turnaround times in the application. This helps the organization see if there are certain surgeons who are less punctual in starting surgeries, and it can help the team reallocate resources to match actuals. By verifying the total time of surgeries, the hospital can ensure it is billing and reimbursing staff correctly.



More accurately able to understand surgery start and end times, as well as turnaround times

### The results

With Surgery Advisor, GMC has been able to gather accurate data on surgery start and end times, as well as turnaround times. This has enabled the organization to have discussions about how to increase on-time starts as well as gain efficiencies in the OR. In addition, the data has enabled the organization to better understand its add-on utilization. Although GMC can’t fully anticipate the unexpected, the data has helped propel the hospital towards its goal of having satisfied associates.

## Project #7: Automating accreditation of new breast cancer center

Many health systems across the country are moving to open new specialized care centers in areas such as cardiology, orthopedics, and cancer treatment in order to provide better, targeted patient care.

These institutions all face an accreditation process before they can open, and that process can be quite time-consuming. Health systems must follow a rigorous and documented process to be successfully accredited.

In 2016, Baptist Health South Florida opened the Baptist Health Breast Center, which was part of the new Miami Cancer Institute, a state-of-the-art center that brought all of Baptist Health's cancer services under one roof, offering 305,000 square feet of clinical services and a 90,000 square foot research facility. The Breast Center wanted to pursue accreditation and certification early in the construction process, and needed an automated way to manage the metrics.



### How Baptist Health South Florida did it

Baptist Health needed to show results for 11 measures for the National Accreditation Program for Breast Centers (NAPBC) and 36 metrics for certification from the National Quality Measures for Breast Centers (NQMBC). The organization was able to use Diver Platform to link data from different sources, apply business rules to that data, and present it to users to help with the accreditation process.

Many of the metrics for both the NAPBC and the NQMBC were related to what types of procedures were done (lumpectomies, mastectomies), therapies used (radiation, chemotherapy), timeliness of care (how long did it take from screening mammogram to diagnostic, etc.), and quality of care.

To gather data for the metrics, Baptist Health had to extract information from 10 different data sources, including its radiology system, EMR, pathology system, and more. All of this data resided in the organization's enterprise data warehouse, which then had to be extracted for each individual measure and metric. Diver enabled the organization to do this.

### The results

Following two years of work on this project and a full day spent with the surveyor from the NAPBC, the Baptist Health Breast Center was recognized with full accreditation and 9 special recognitions. Baptist Health was able to provide metric results that were previously only attainable through hours of manual chart review.

The automation of the metrics through Diver made the accreditation attainable. The Breast Center had previously given up on the accreditation prior to this because it did not have the time and resources needed for the manual chart review. But with Diver, the center received full accreditation at the outset and did not have to go back and fix anything or answer any outstanding questions from the surveyor.



Achieved full accreditation with 9 special recognitions

## Project #8: Improving treatment of diabetes patients

Nearly 1 in 10 Americans has diabetes, and the numbers continue to grow. Controlling this disease is important to avoid complications and achieve efficient care. Over the last several years, insulin therapy for diabetes patients has changed from the “old” sliding scale to newer basal-bolus regimens. And providers can now measure the efficacy of these treatments through better data analysis.

Main Line Health, based in greater Philadelphia, wanted to guide its physicians away from sliding scales insulin and towards basal-bolus regimens. However, many physicians were circumventing decision support interventions and building their own sliding scales. Physician leadership wanted clinical intelligence to analyze the extent to which physicians were using sub-optimal insulin regimens, as well as demonstrate the impact insulin regimens had on patient outcomes so the organization could coach physicians toward better diabetes management.



### How Main Line Health did it

Main Line used Diver Platform to create an endocrinology analytics dashboard to analyze physician insulin therapy ordering patterns and to correlate the choice of insulin regimen with patients’ glucose outcomes. With Diver, the Main Line team was able to pull in and aggregate the data, create business rules and calculations to transform the data, and build the data models that feed the endocrinology analytics dashboards.

The dashboards presented physician leadership with:

- Physician insulin regimen ordering patterns
- Impact of insulin regimen on glucose trends
- Length of stay
- Drill-down to ordering or attending physician
- Ordering behavior trends

### The results

With Diver, Main Line was able to demonstrate the benefits of newer basal-bolus over “sliding scales” insulin regimens. Physicians reviewing results were able to see that for the majority of cases, a basal-bolus insulin regimen results in better glucose management. The dashboard also provided insight into clinical and efficiency measures, showing that patients with a basal-bolus regimen had an equal or shorter median length of stay. It also highlighted large variances in physician ordering patterns, enabling the organization to easily identify physicians who could benefit from in-service training.



Demonstrated value of newer basal-bolus over “sliding scales” regimens

## Project #9: Improving patient safety scores

Patient safety and quality scores are important metrics for hospitals to measure, as they reflect the level of care provided to patients and allow for patients to make more informed choices about which hospitals and providers they seek care from.

Sarasota Memorial Health Care System is among the largest public health systems in Florida. It is a full-service health system with specialized expertise in heart, vascular, cancer, and neuroscience services, and has a network of outpatient centers, long-term care, and rehabilitation centers.

For Sarasota Memorial, keeping close tabs on patient safety and quality scores is paramount for both providing the best possible patient care and ensuring it is employing the best staff and reimbursing them correctly. The hospital wanted a way for management to easily and quickly access scores when they need them.

### How Sarasota Memorial did it

Every year, the Agency for Health Care Research and Quality (AHRQ) puts out a Safety Culture Survey that asks staff what they think of the safety culture of their organization. Once Sarasota Memorial received AHRQ's calculations, the organization put them into Diver Platform so the results should be shown via a dashboard. The results can be shown as percentages, bar graphs, or as written comments on the survey. Users can filter the results of the current survey and look at results from past years.

The hospital similarly uses Diver to report on information from Healthgrades, an organization that grades hospitals on various quality metrics. Diver displays the metrics using Healthgrades' methodology. Sarasota Memorial then uses that information to improve in various areas.

Sarasota Memorial management also conducts routine surveys that are linked to staff increases. These surveys include chart audits, nursing interviews, and environmental care rounding. All of the information is brought into Diver and displayed in a scorecard. This scorecard shows an overall performance score, which is linked to merit increase calculations. Managers and staff can also use the scorecard to see which specific areas staff members are performing well on and which ones need improvement.



### The results

The Diver dashboard provides management and staff with quick and easy access to critical numbers that the organization uses for improvement. For example, the orthopedic nurses use a dashboard that shows them categories including monthly volume, length of stay, mortalities, discharges to home, and 30-day readmits. The dashboard was set up for a certification process but the nurses found it so effective in their day-to-day work that they continued using it.



Quick and easy access to critical numbers  
for hospital improvement

## Project #10: Providing physicians with real-time data to improve their practices

The competitive landscape is quickly changing for physicians. Many physicians are abandoning their private practice and are aligning themselves with hospitals or health systems. In addition, physicians face new competitive threats from the rise of urgent care centers and telehealth options, which offer patients fast and convenient forms of diagnosis and care.

To compete in this new landscape, physicians need to better understand their patients, be more responsive to their needs, and more granularly understand the financial and operational aspects of their practices. Data can help them get there.

Allied Physicians Group is a group of 130 independent pediatricians on Long Island, New York. The group uses data and analytics to provide better information to its physicians so they can manage their individual practices.

### How Allied Physicians Group did it

Allied Physicians uses Diver Platform to create dashboards that enable physicians to better understand aspects of their practices. For example, with Diver, physicians are able to view operations data such as staffing and peak utilization times. They can then use this to make decisions about optimal hours to keep their practices open. In addition, they are able to understand which patients are due in for well-visits, and then their offices can proactively call patients to ensure they are being seen on a regular basis.

In addition, Allied Physicians Group uses Dimensional Insight's General Ledger™ Advisor application to view financial data in a variety of ways. With General Ledger Advisor, the organization can view financials in aggregate, by division, by physician, and by department, and then dive into the details if need be. The organization's central office is then able to work with individual practices to make better financial decisions. And all of this can be done in real-time, instead of having to wait for the books to close each month.



### The results

Allied has seen both quantifiable and unquantifiable savings from its analytics deployment. For example, it has saved about 10 hours per week in labor for its financial department, translating to cost savings of \$40,000 per year.

More than that, though, Allied is able to make better and faster decisions that improve the patient care delivered by its physicians.



Saved \$40,000 per year in financial department; able to make better and faster decisions to improve care.



## About Dimensional insight

Dimensional Insight® is a leading provider of analytics, data management, and performance management solutions, offering a complete portfolio of capabilities ranging from data integration and modeling to sophisticated reporting, analytics, and dashboards. The company is a seven-time Best in KLAS winner in healthcare business intelligence and analytics, most recently ranking #1 in 2020. Founded in 1989, Dimensional Insight has thousands of customer organizations worldwide. Dimensional Insight consistently ranks as a top performing analytics organization by customers and industry analysts in its core market segments including healthcare, manufacturing, and beverage alcohol.

For more information, please visit <https://www.dimins.com>

