

Improving clinical communications at Dignity Health's St. Joseph's Medical Center

A value analysis of PerfectServe's
impact on hospital operations

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The PerfectServe logo consists of a cluster of colored dots in the top right corner, arranged in a roughly triangular pattern. The dots are colored orange, blue, and green.

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Executive summary

Today's healthcare delivery landscape is changing rapidly. With healthcare reform legislation and healthcare payment reform at the forefront, more emphasis is being placed on efficient coordination of care across settings and ensuring access to care.

Effective communications within and among the care team are essential to safe, high quality care, efficient care coordination and access management.

PerfectServe, a company that provides a next-generation, clinical communications platform which makes it easy for clinicians to connect with each other, engaged Maestro Strategies, a nationally recognized healthcare strategy and transformation firm, to complete an independent, third-party evaluation of PerfectServe's impact and value on hospital operations.

This paper examines the experience of one hospital, St. Joseph's Medical Center of Stockton, California, and its initial implementation of the PerfectServe clinical communications platform.

Multiple benefits associated with the PerfectServe implementation were identified, including enhanced patient throughput, improved clinical outcomes and patient satisfaction related to quietness scores.

Measuring the quantitative and qualitative impacts between a defined pre-implementation period, and a five-month post-implementation period confirmed significant changes in operating performance.

As St. Joseph's Medical Center continues to expand on current adoption and use of the PerfectServe platform, even greater benefits and value are anticipated by the leadership team.

The case for improving clinical communications

In today's challenging healthcare environment, clinicians have limited time to spend with patients, making communications between clinicians, regardless of the care setting, critical to ensuring the best outcome for the patient and the provider. Unfortunately, the healthcare delivery system of today lacks standardized processes for collaboration between colleagues because there are limited tools to enable clinicians to effectively filter, manage and prioritize communications.

Limitations on communications have a significant impact on both patient outcomes and provider productivity. According to one estimate,

U.S. hospitals waste approximately \$12 billion annually due to poor communication among care providers; 54% of the waste can be attributed to an increased length of stay and associated increased cost of care.¹

In addition, multiple studies indicate that 70-90% of errors are due to poor communication between professionals.² Actual versus predicted mortality rates vary significantly based on the effectiveness of communications (41% worse than predicted for poor communications and 58% better than predicted for excellent communications).³

Nurse-to-physician communications can be particularly problematic. A study of nurse-to-physician communication found that between 10% and 40% of total communication time was spent attempting, but failing, to communicate with the correct provider, which meant nurses were spending valuable time searching for information to determine the appropriate provider and/or phone number.⁴

In fact, 14% of all pages were sent to the wrong physician—a physician/resident who was scheduled to be off-duty or out of the hospital—and 47% of those were urgent messages.⁵ “The ability of physicians and nurses to work as a unified team is essential to improved outcomes, error and risk reduction and optimum care.”⁶

A study on the barriers of effective physician and nurse communication in the long-term care setting showed that the third most frequent barrier was difficulty reaching the physician.⁷

Physician-to-physician communications are also plagued with challenges. Communication has been identified as a major contributing factor in the occurrence of sentinel events. Handoffs and transitions are specific types of communication that require the successful transfer of information to ensure safe, effective patient care, and currently, there is no standard for communicating information between a hospitalist and the primary care physician (PCP) at discharge.⁸

In fact, effective ways to manage physician transitions and handoffs are not being taught to today’s residents. Of attending physicians at the University of Colorado, Denver hospitals, only 6% said they had been formally taught handoffs in medical school, and only 28% had been formally taught handoffs in residency.⁹

The use of hospitalists as inpatient care givers with discharge to primary care physicians for post-discharge follow-up has demonstrated that physician-to-physician communications have become increasingly important. According to one source, direct communication between inpatient (hospitalist) physicians and PCPs occurred during only 3-20% of hospitalizations. At the time of first post-discharge visit, PCPs in the study had received no written discharge information in up to 50% of patients. Only 17% of PCPs reported receiving notification from hospitalists about discharges.¹⁰

Failure to follow through with hospitalist discharge orders (durable medical equipment, follow-up visits with the PCP and other therapies or clinics) leads to avoidable emergency department (ED) visits and re-hospitalizations.¹¹ In fact, between 19% and 23% of patients recently hospitalized experienced an adverse event after discharge due to some form of inadequate post-discharge follow up.¹² The adverse events frequently occur within the first five days after discharge.¹³ According to CMS, in fiscal year 2009, 13% of readmissions (worth approximately \$12 billion) were potentially preventable.¹⁴

Communication breakdowns also threaten the safety of surgeries. A review of 444 cases showed the most common communication breakdowns involved failure of a resident to notify the appropriate attending surgeon of a critical event and nonexistent attending-to-attending handoffs.¹⁵

Finally, professional outcome measures such as job stress, group cohesion and nurse satisfaction with decision-making are also influenced by nurse/physician collaboration.¹⁶

With the advent of healthcare reform and accompanying new models of reimbursement including bundled payments and Value-Based Purchasing, transitions of care must be more effectively coordinated. Effective communication between clinicians across the care continuum is essential for coordinating transitions.

Key technologies enabling clinical communications improvement

The healthcare industry continues to employ multiple point solutions and technologies such as call centers and answering services, overhead paging, secure text messaging, web-scheduling/paging software, pagers and wireless phones.

The challenge with many of these tools is a limited ability to address the complexity inherent in clinical communication processes—not only within the hospital between one or more siloed departments, but across multiple care settings, including ambulatory, acute care and post-acute care environments.

It is difficult for clinicians to keep up with manual phone lists, call schedules and other sources of information that are required to establish actual contact between clinicians.

Communications directed to physicians can be especially challenging because physicians must control their accessibility in order to manage their time effectively. To this end, physicians often erect barriers to protect themselves (e.g., third-party intermediaries such as answering services and office staff), yet, in many cases, these barriers create friction, which impedes communication and compromises care.

The emergence and acceptance of smartphones and tablets in healthcare settings has been essential to driving not only provider productivity, but improving the coordination of care across settings (physician office, ambulatory settings, acute care, long-term care and others). Improvement in both technology and bandwidth continues to drive more sophisticated methods to provide effective clinical collaboration and better patient care.

A new technology is emerging, which is built upon a secure and comprehensive communications platform, coupled with a decision rules engine and purposeful communications process design, optimizing call and message routing to ensure accuracy and reliability; and, thus, enables clinicians to make decisions more quickly.

This platform, with built-in algorithms that define an organization's clinical communications processes, facilitates effective clinician-to-clinician contact based on a number of variables, such as the origin of the interaction, the originator's role, the nature and urgency of the interaction, patient identity, time of day, day of the week, call coverage schedules and the clinician's preferred contact method.

Dignity Health's
St. Joseph's
Medical Center

St. Joseph's Medical Center is a not-for-profit, 359-bed hospital in Stockton, California, and is a member of Dignity Health (formerly Catholic Healthcare West), which includes more than 40 hospitals and care centers in California, Nevada and Arizona. St. Joseph's Medical Center has over 400 physicians on staff and offers specialized services in cardiovascular care, comprehensive cancer services and women and children's services including neonatal intensive care.

The chief medical officer, Dr. Susan McDonald, identified the need to improve clinician communications as a critical issue at St. Joseph's Medical Center and determined that, while process improvement was needed, technology would be the key to managing and maintaining the complex communication process algorithms unique to physicians.

"As the new chief medical officer for St. Joseph's, one of the first issues I wanted to address was improving communications between physicians and between physicians and hospital-based staff. The need was apparent, and the solution needed to be technology-based."

Susan McDonald, M.D.

Chief medical officer, St. Joseph's Medical Center

Physician focus groups and interviews with nurse managers, nurses and unit secretaries throughout the hospital revealed that waste, frustration and risk repeatedly arose from St. Joseph's Medical Center's existing clinical communications processes. The same group expressed a desire for change and felt standardizing communications on a single, intelligent platform could help them meet the following organizational goals:

- Improve patient satisfaction by reducing noise associated with overhead paging of physicians in the hospital.
- Build alignment between the hospital and the medical staff, and make it easier to practice at St. Joseph's by providing physicians with a single, integrated solution to manage all clinical communications (whether from colleagues, patients or hospital staff).
- Improve patient outcomes by reducing the number of rapid response team calls, code blue events and mortality rates through decreased time to intervention and treatment when a patient's condition is deteriorating.

- Improve patient throughput by refining processes dependent on clinical communications, resulting in reduced length of stay within inpatient units and improved ED throughput.

St. Joseph's Medical Center elected to deploy PerfectServe because of its ability to simplify and streamline communication processes so clinicians can better direct and manage patient care.

Unlike the point solutions discussed in the previous section, PerfectServe brought three capabilities to St. Joseph's that are essential to effectively manage the complexity inherent in clinical communication processes:

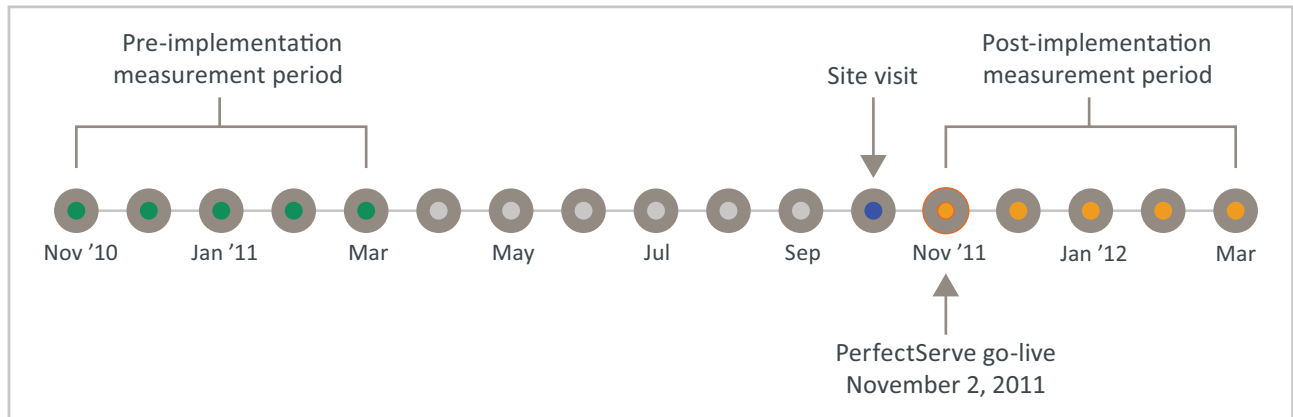
- A secure and comprehensive communications platform with an advanced rules engine purpose-built for medicine
- A service organization to quickly drive process improvement standardization across the enterprise and sustain it over time
- A suite of integrated, cloud-based applications that makes it easy to connect interdependent clinicians in any care setting

Study approach and methodology

PerfectServe engaged Maestro Strategies, a nationally-recognized healthcare transformation firm, to provide an independent, third-party evaluation of the impact of PerfectServe on hospital operations at St. Joseph's Medical Center.

With the cooperation of the hospital leadership team and support personnel, Maestro was able to assess both the qualitative and quantitative impact of PerfectServe and the new communication processes it enabled in an acute care setting. The timeline below represents key milestones in this assessment.

Measurement period



Pre-implementation visit

In order to understand the current operating environment around clinical communications, Maestro Strategies completed a two-day site visit to St. Joseph's Medical Center in October 2011. Interviews were conducted with key leadership, nursing unit managers and physicians.

The purposes of the interviews were twofold: 1) to gain insight into the challenges with the current means of communications between clinicians, and 2) to document expected benefits associated with implementing PerfectServe. In addition to interviews, direct observations were conducted on several nursing units and other patient care areas.

Development of benefits hypotheses

After spending two days on site, the Maestro team combined and analyzed the interview results and observations with potential benefits cited from literature review and research to develop an extensive list of benefit hypotheses which could be tested. This list was then refined to tie to and reflect key objectives that the hospital leadership team wished to accomplish.

Baseline measurement

Once the potential list of benefits was developed, the data required to measure those benefits was identified and baseline data was requested from St. Joseph's. In order to account for seasonality, a full year of data from the period prior to the PerfectServe implementation was requested.

Where available, the data was submitted on a month-by-month basis. The data was examined to determine completeness and suitability for inclusion in the post-implementation analysis. Based on the availability of and difficulty in acquiring the data, some hypothesized benefits were dropped from the list.

Implementation of PerfectServe

The PerfectServe team spent several months preparing for a go-live date of November 2, 2011. Pre-implementation activities included the technical aspects of configuring the PerfectServe hospital applications for both Web and phone access. Special emphasis was placed on expanding the use of wireless Spectralink phones by nursing staff.

After analyzing key characteristics of the medical staff to identify those physicians most likely to drive high utilization, PerfectServe implementation consultants began meeting with physicians and their staff to document each practice's current and desired state communications process flows, call schedule structure and each physician's and mid-level provider's personal contact preferences. The consultants then assembled this information within the PerfectServe platform for each practice workgroup and medical staff member.

Prior to go-live, numerous education sessions were held regarding the following topics:

- How to modify and maintain call schedules and activate different pre-defined contact processes
- How to use the mobile app, voice and Web interfaces
- What to expect from the new communication processes
- When and how to use PerfectServe's help center

During the go-live, the PerfectServe team was on site rounding in the hospital and meeting with physicians, staff members in the hospital and practice offices, as required to address issues associated with the new platform. Over the five-month post-go-live period, PerfectServe consultants continued to work with clinicians to optimize their contact processes and help them maximize the use of PerfectServe's capabilities.

Post-implementation measurement

Two periods of time were selected to measure post-implementation impacts of the PerfectServe process. An “early term” measurement was conducted, which utilized data from the first 90-day post-go-live period. A mid-term measurement was made for the subsequent 60 days. In total, five months of post-go-live data were examined. In addition to the data analysis, follow-up interviews were conducted with key members of the leadership team to better understand the benefits realized at St. Joseph’s Medical Center.

Benefits analysis

In the five months following the PerfectServe implementation, St. Joseph’s Medical Center demonstrated significant improvement in clinical processes dependent upon effective and efficient communications.

With PerfectServe handling approximately 14,000 clinical communication events each month during the study period, the benefits achieved include standardization of contact processes and procedures across the medical staff.

Benefits analysis focused in the following areas:

- Quietness scores—patient satisfaction
- Patient outcomes
- Patient throughput

The new communication processes dramatically reduced third-party handoffs and overhead paging, and eliminated the need to maintain and refer to manual lists and call schedules. This information is all built in to PerfectServe algorithms, allowing calls and messages to route accordingly with greater accuracy and reliability.

Quietness scores—patient satisfaction

Prior to PerfectServe, overhead paging was the primary means of initiating a search for a physician in the hospital. Overhead paging was identified as a dissatisfier for both patients and physicians. One way to measure the effect of reduced overhead paging is to use patient

satisfaction scores related to noise.

The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey is completed by patients or their families at discharge and consists of a series of questions about the patient experience while in the hospital.

The survey specifically asks: “During this hospital stay, how often was the area around your room quiet at night?” The percentages calculated are for patients who answered “Always.” For St. Joseph’s Medical Center, this particular metric was consistently below organizational targets and was part of the reason for deploying PerfectServe. Scores for quietness improved by 24% from the pre-implementation period as compared to the same period post-implementation.

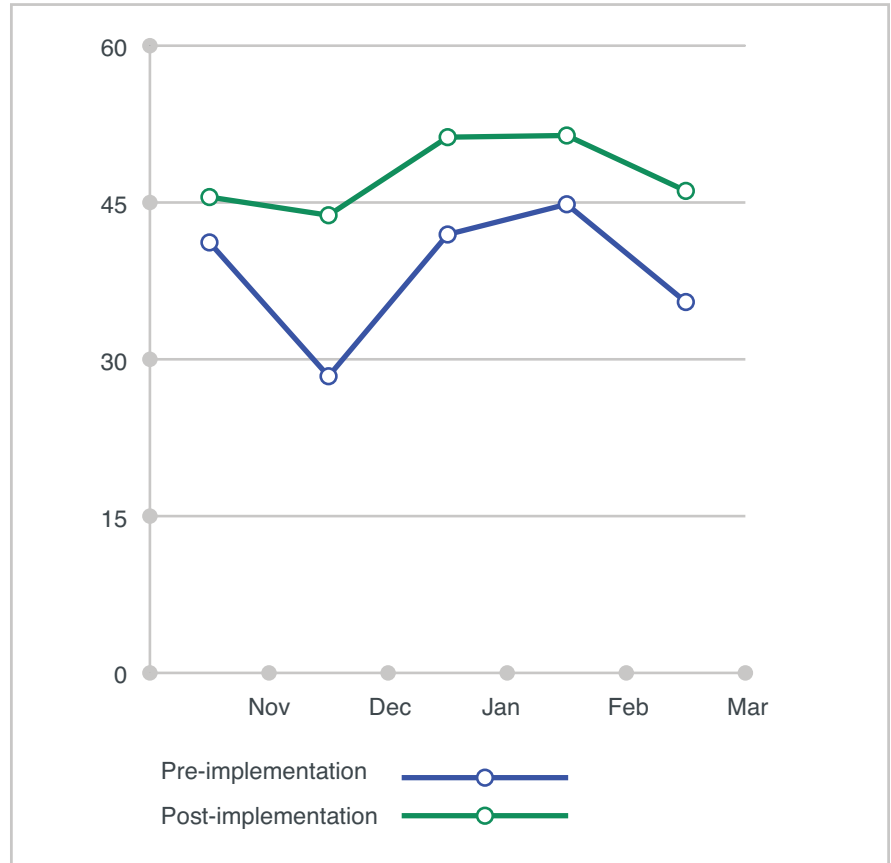
“Overhead paging has almost been completely eliminated, making the hospital a quieter place for our patients and staff. We are finding that this is yielding higher patient satisfaction with quietness of the hospital. We’re excited about all that we have achieved so far with PerfectServe for our physicians and nurses.”

Don Wiley

President & CEO, St. Joseph’s Medical Center

HCAHPS scores for quietness have improved 24% post implementation compared to the same period in the prior year. For St. Joseph's this represents an estimated \$95,000 in revenue.

Percent of patients who responded to the statement: "Room was always quiet at night."



For St. Joseph's, this represents an estimated \$95,000 in revenue. The quietness measure is part of the aggregated score used to determine reimbursement under Value-Based Purchasing and can potentially affect overall Medicare reimbursement. Using Medicare weighting schemes, the amount at risk for St. Joseph's Medical Center specifically related to quietness scores is \$95,000 per year based on 2011 Medicare volumes and charges.

Patient outcomes

Communications related to changes in patient condition or patient deterioration are complex and involve a significant amount of time. Direct patient care providers must leave the patient bedside to initiate contact with the physician to obtain orders to intervene when a patient's condition changes or deteriorates. Enhanced and timely communication between

the direct care provider and the physician can reduce time to treatment when patient condition deteriorates. More timely medical intervention may also reduce the need to initiate call for the rapid response team (RRT) and can also lessen the frequency of code blue events.

To positively impact patient outcomes in addition to streamlining the nurse-to-physician contact process, PerfectServe worked closely with the nursing staff to increase wireless Spectralink phone adoption to better facilitate direct physician-to-nurse communication when a rapid response was required. On each Spectralink phone, PerfectServe can be accessed directly via a direct dial number. When a nurse initiates a call into PerfectServe using a Spectralink, the number associated to that nurse's phone is automatically embedded into the message for the physician, which, in addition to providing automatic documentation, makes the return call easy for the physician.

The number of RRT calls and code blue events was examined on a quarterly basis and the number of calls and codes per 1,000 discharges was calculated. The rate of both RRT calls and code blue events decreased after the PerfectServe implementation. Because data was only available on a quarterly basis and the PerfectServe implementation occurred in the middle of a quarter, a specific period of time was considered a transition period.

Prior to PerfectServe, the rate of RRT calls over six months averaged 29 calls per 1,000 discharges. Post-implementation the rate dropped to 28 calls per 1,000 discharges, which represents a 3% improvement.

Similarly, the average rate of code blue events per 1,000 discharges was 14 pre-implementation and decreased to 11 after PerfectServe, a 24% improvement.

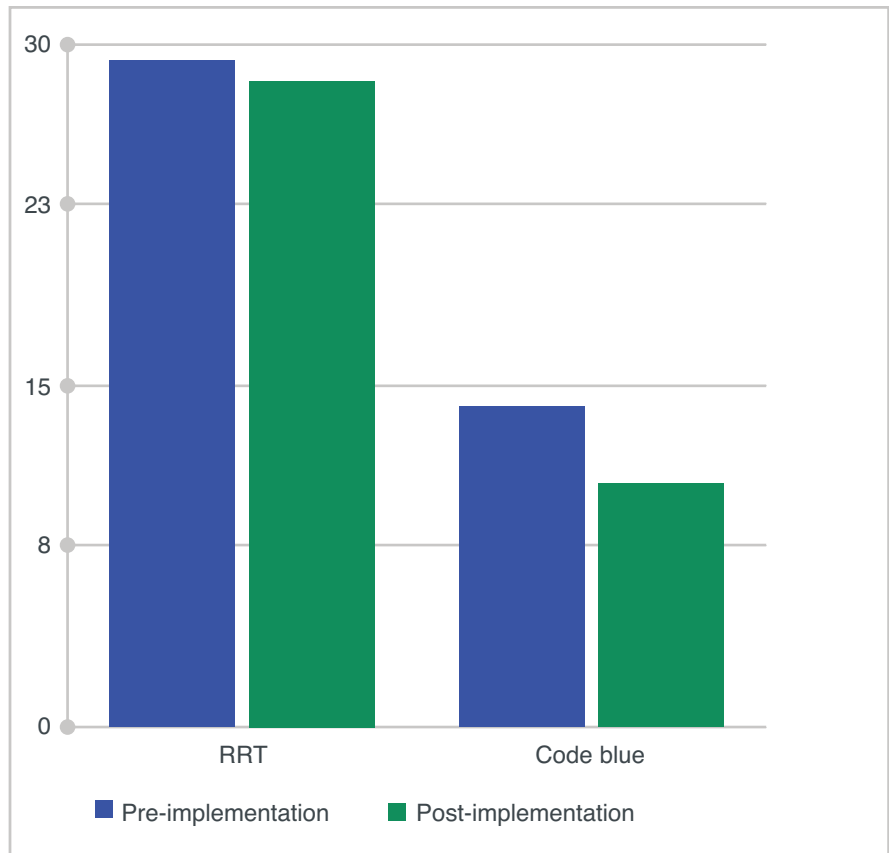
Combined, these statistics imply that shorter communication cycle times are likely contributors to more timely interventions for patients whose conditions are deteriorating.

RRT and code blue calls per 1,000 discharges

The rate for both rapid response team (RRT) and code blue events decreased after the PerfectServe implementation.

Average RRT calls per 1,000 discharges dropped 3%.

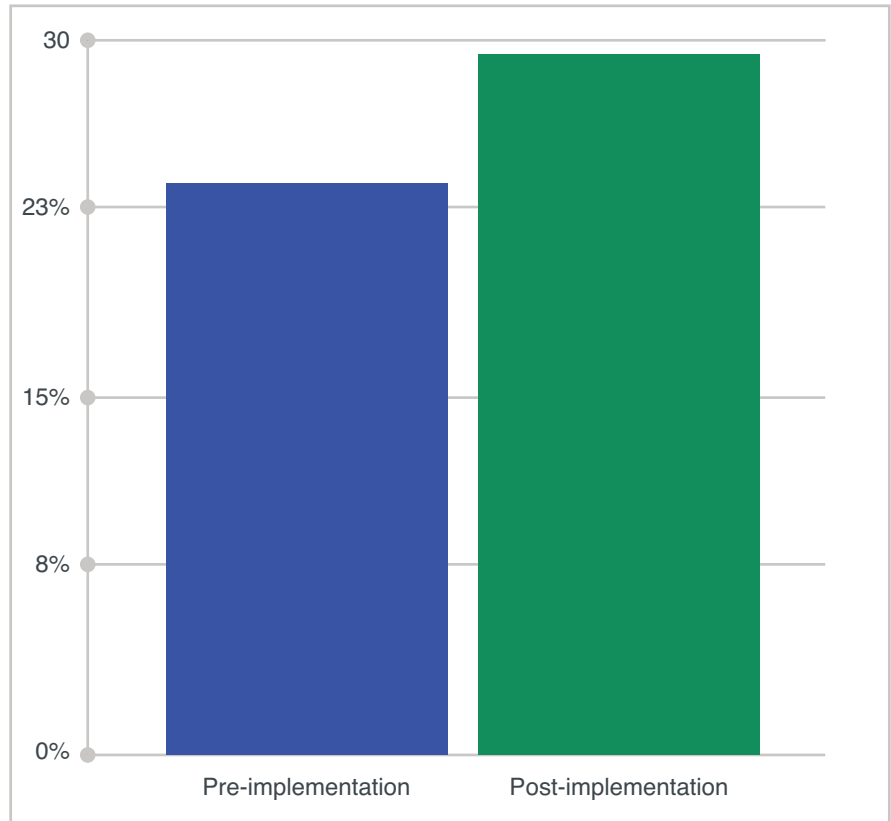
Average code blue events per 1,000 discharges dropped 24%.



A related statistic is the improvement in outcomes for patients who have a code blue event. The percent of patients discharged alive after a code blue event improved from an average of 24% pre-implementation to 29% post-implementation. Furthermore, as consumers scrutinize individual hospital performance through publicly available data such as Hospital Compare, statistics, such as mortality rate, have the potential to drive provider choice and impact market share. In addition, payers use hospital outcomes and performance in their negotiation process with providers, which directly impacts hospital revenue.

Percent of patients discharged alive

The percent of patients discharged alive after a code blue event improved from an average of 24% pre-implementation to 29% post-implementation.



Patient throughput

Clinician-to-clinician communication is a high frequency, highly variable activity in hospital operations. As such, its efficiency and effectiveness have a significant impact on patient throughput across the acute care setting.

Nurses need to connect with physicians to obtain orders so they can initiate care. When communication cycle times are unnecessarily long, action is delayed, which impedes throughput. A patient who is ready to be discharged, but is waiting for final approval from either the attending or a consulting physician, may not be able to be discharged in a timely manner, resulting in an additional night in the hospital—impacting length of stay.

In addition, patients being admitted (especially through the ED) may have to wait for an available bed on a nursing unit until existing patients are discharged. This, in turn, impacts ED throughput as patients waiting to be

seen cannot be placed in an examination room until patients waiting on admission have been moved to inpatient units.

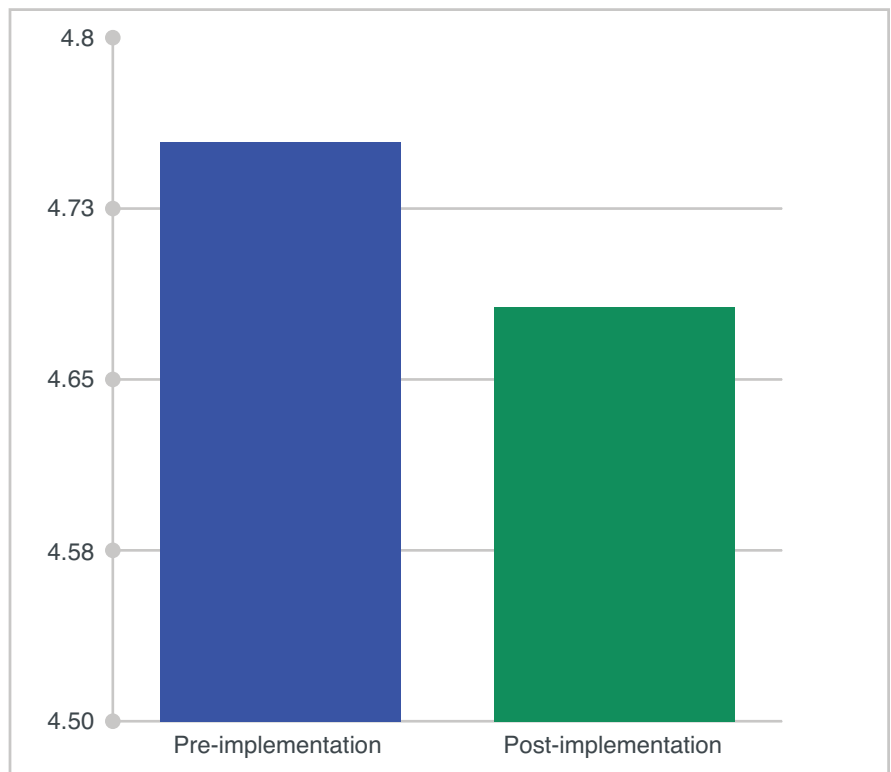
Many times, extended wait times in the ED result in patients leaving without receiving care. In addition, there are times the ED will have to divert ambulances to other facilities as it has no capacity to receive additional patients. This results in loss of revenue to the hospital, as well as potentially compromising patient safety.

Reduced length of stay

The average length of stay (ALOS) for the post-implementation period was 4.68 days compared to 4.75 days for the same period (November-March). This represents a 1.6% decrease in ALOS.

Average length of stay (days)

Average length of stay (ALOS) decreased 1.6% after the PerfectServe implementation. This has a significant impact on contribution margin for DRG-based reimbursements, and represents a potential savings of \$1,982,000 for St. Joseph's.



This has significant impact on contribution margin for patients whose reimbursement is DRG-based (Medicare and Medi-Cal).

For St. Joseph's, potential savings related to reduction in ALOS are summarized in this table:

Length of stay improvement value analysis	
Annualized number of DRG-based discharges	11,605
Average variable cost/day	\$2,358
Average length of stay pre-implementation	4.754 days
Average length of stay post-implementation	4.682 days
Reduction in LOS	0.072 days
Estimated potential savings: (0.072 days) x (\$2,358 cost/day) x (11,605 discharges)	\$1,981,552

Emergency department throughput

St. Joseph's Medical Center has an ED triage system that ensures every patient has a brief discussion with a clinician once he or she is registered. However, depending on the urgency of a patient's condition at triage, they may be asked to sit in the waiting room until they can be seen. For many patients, the wait times can be long and they ultimately leave without receiving care.

The number of patients who left the ED without receiving care (for data collection and analysis purposes, leaving against medical advice (AMA) was used as a proxy for leaving without receiving care) during the post-implementation period was 786 compared to 986 for the same period pre-implementation. This represents a 20% decrease in patients who left AMA.

The reduction in number of patients leaving AMA also correlates (inversely) to the increase in number of patients seen as detailed in the graph below.

As the number of patients leaving AMA decreased, the number of patients seen and treated increased. The increase in the number of patients seen during the post-implementation period compared to the same months in the pre-implementation period was 11%.

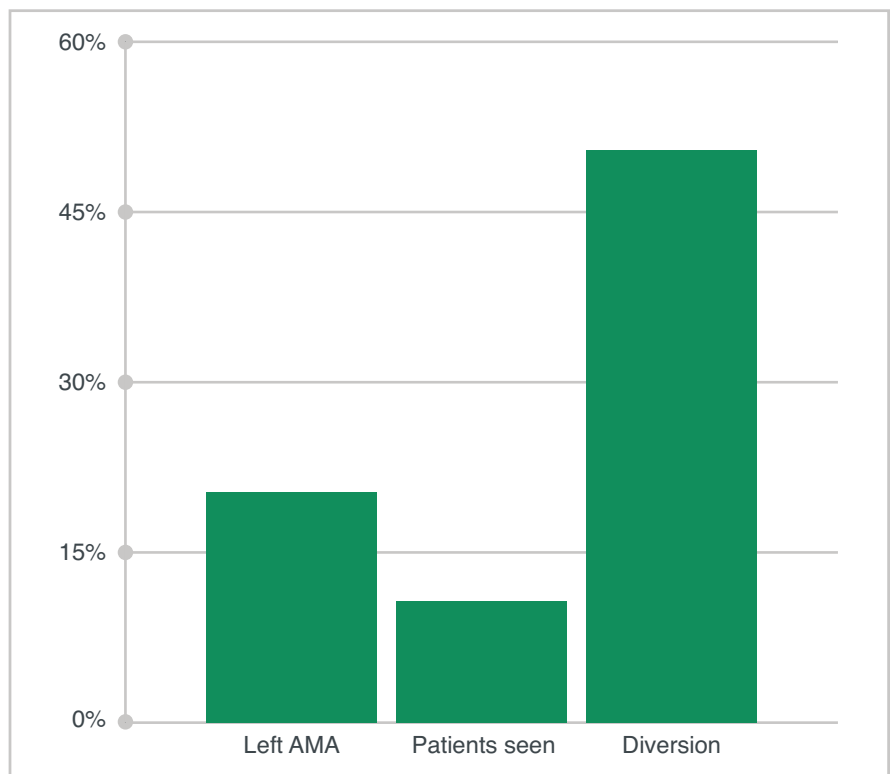
In addition, the amount of time spent on diversion has decreased. The combination of these three statistics demonstrate that St. Joseph's Medical Center has been able to dramatically impact ED throughput—by seeing more patients, by reducing the number of patients leaving AMA and by limiting the amount of time the ED is on diversion.

Percent improvement in ED patient throughput

After the PerfectServe implementation, the ED experienced 20% decrease in patients who left against medical advice (AMA).

This correlates to an 11% increase in patients seen and treated.

In addition, the amount of time spent on diversion decreased by 50%.



The implications for this are broad, as patient care, patient safety and patient satisfaction can be positively impacted and the organization can recognize revenue opportunities.

ED patient throughput improvement value analysis	
Average direct margin/ED outpatient	\$355
Number of patients who left the ED AMA annually pre-implementation	2,076
Annual expected patients leaving AMA after implementation	1,655
Reduction in left AMA	20%
Incremental patients expected post-implementation	421
Estimated potential annual incremental margin (421 patients) x (\$355 direct margin/patient)	\$149,386

Benefits summary

St. Joseph's Medical Center realized a variety of benefits, both quantitative and qualitative, through the process improvements PerfectServe enabled.

The matrix below summarizes the before and after improvement and the financial impact where applicable:

Summary value analysis	Before	After	% Improvement	Impact
Reduced noise, increased HCAHPS	38%	48%	24%	\$95,000
Reduced average length of stay	4.75	4.68	1.6%	\$1,981,000
Decrease in ED patients leaving AMA	2,076	1,655	20%	
Increase in ED patients seen	19,762	21,875	11%	
Reduced ED time spent on diversion	11,282	5,594	50%	\$150,000
Reduced RRT calls/1,000 discharges	29	28	3%	Quality
Reduced code blue events/1,000 discharges	14	11	24%	Quality
Increased % discharged alive after code	24%	29%	21%	Quality

As post-implementation interviews were conducted with hospital leadership, additional benefits associated with the PerfectServe solution were identified.

For example, by providing nurses the ability to easily reach the administrator on call via PerfectServe, floor nurses were able to resolve operational issues more quickly. While there is not a metric to describe this benefit, leadership sees clear advantages in simplifying lines of communication.

“While we cannot attribute 100% of the improvement in key metrics (such as length of stay) specifically to PerfectServe, we believe that it has contributed to these improvements and that overall, PerfectServe has paid for itself.”

Don Wiley

President & CEO, St. Joseph’s Medical Center

Closing remarks

Health systems that use PerfectServe to standardize existing clinical communication processes—and enable new processes—have the potential to significantly impact patient care across the continuum.

As documented in this paper, the value of PerfectServe’s offerings has clearly been demonstrated at Dignity Health’s St. Joseph’s Medical Center.

Clinician-to-clinician communication is a high frequency, highly variable activity, which, when under the status quo, negatively affects hospital operations and the quality of care.

Effective clinician-to-clinician communication can be dramatically improved by deploying a single platform solution that enables efficient processes to make it easy to connect clinicians across multiple care settings.

When clinical communication processes are enabled with rules-based intelligent technology, communication, collaboration and coordination of care occur more quickly. This positively impacts patient outcomes, patient throughput and patient and care team satisfaction.

This paper represents the early measurement of results experienced by St. Joseph’s Medical Center. There is an expectation across senior leadership that continued efforts to apply PerfectServe to greater numbers of communications—dependent clinical processes will lead to an increased impact with existing identified benefits, and that there will be

additional benefits that will be identified and quantified.

While the benefits measured in this study were confined to the inpatient setting, PerfectServe's platform extends beyond the four walls of the hospital to outpatient and ambulatory care settings for many of St. Joseph's physicians.

There is further opportunity to expand PerfectServe capabilities to help enable clinical integration, care coordination and improvements in cost and quality.

About Maestro Strategies

Maestro Strategies is a nationally recognized healthcare strategy firm specializing in technology driven transformation. Members of the Maestro team have served as thought leaders in the area of return on investment (ROI) and benefits realization for over ten years. Authors of the award-winning book series on return on investment of HIT, Maestro works with healthcare leaders to plan for value and then manage that value into reality. For more information, please visit: www.maestrostrategies.com.

About PerfectServe

Serving health systems to improve outcomes and efficiency, PerfectServe's secure and comprehensive clinical communications platform makes it easy to connect clinicians across the continuum so they can better coordinate care. Based in Knoxville, Tennessee, PerfectServe processes more than 35 million transactions annually, connecting more than 50,000 physicians in more than 118 hospitals and 14,000 medical practices across the United States. For more information, go to www.perfectserve.com or call 866.844.5484.

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