

WHITE PAPER

Improving Heart Failure Outcomes through Interactive Patient Care: The Sentara Virginia Beach General Hospital Experience

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executive summary

In the United States, Heart Failure has reached national healthcare crisis status. It is the primary or secondary diagnosis listed in more than 2.6 million hospitalizations each year. And unlike other cardiac diseases, the incidence of Heart Failure continues to grow.

The American healthcare system continues to grapple with poor outcomes in the treatment of Heart Failure. Average length of stay for patients is on the increase, and more than 20 percent of Heart Failure patients who are treated are readmitted within 30 days of discharge.

These poor outcomes have raised warning flags within leading government agencies and healthcare advocacy groups, who have pushed to create new care standards designed to raise the quality and efficiency of treatment. Hospitals too, are seeking to improve outcomes, both for the sake of their patients and to reduce cost per case.

This paper examines the Heart Failure treatment experience of Sentara Virginia Beach General Hospital (SVBGH), Virginia Beach, VA. This hospital, whose Heart Failure outcomes had traditionally mirrored national data, leveraged existing Interactive Patient Care (IPC) technology to create a Heart Failure Interactive Care Plan, an automated, interactive pathway that closely involved Heart Failure patients during every step of their care, from point of admission, to point of discharge, and beyond. This four-phase Care Plan assures that all patients are assessed and educated about their disease, understand their role in maintaining a healthy lifestyle, and are motivated to take more responsibility for their own good health.

The implementation of the SVBGH Heart Failure Interactive Care Plan in March 2008 led to significant outcomes improvements in several key areas:

- (1) **The average Heart Failure readmission rate** 30 days post-discharge dropped from 20.8% in FY 07, to 5.4% in FY 08, representing a **74% reduction in readmission rates**.
- (2) **Average patient length of stay**, noted at 7.0 days in 2007, was measured at 6.1 days for HF patients in FY 08. **This marks a 13% reduction in average length of stay from FY 07.**
- (3) When applying national average inpatient cost per day to the reduction in average length of stay at SVBGH for Heart Failure patients, the **expected total annual cost savings is estimated at \$831,000** with the 0.9 day reduction in average length of stay between FY 07 and FY 08.
- (4) **Patient satisfaction** with the quality of their medical education spiked dramatically, rising from 59.3 (scale of 1-100) in FY 06 and 66.0 in FY 07, to 93.8 in FY 08. **Patient satisfaction with education increased 43% after roll-out of the Heart Failure Interactive Care Plan.**

The experience of Sentara Virginia Beach General Hospital is a study in the importance and relevance of patient engagement as a core strategy for performance improvement. It is a demonstration of how one hospital harnessed the power of real-time, interactive bedside technology to improve quality and safety and increase satisfaction and service outcomes, while simultaneously realizing cost performance improvements in the care of its Heart Failure patient population.

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Heart Failure (HF) is a major and growing health problem in America; the prevalence and impact of HF is wide and is expected to increase significantly in coming years.

Today, more than five million people are living with this disease. It is the first-listed diagnosis in approximately 875,000 hospitalizations annually and is a secondary diagnosis in 1.8 million annual discharges. Heart Failure is the single most common diagnosis for hospital patients aged 65 and over, accounting for 20 percent of all hospitalizations in this age group. According to the Agency for Healthcare Research and Quality (AHRQ), treatment of Heart Failure accounts for approximately \$25 - 35 billion in healthcare expenditures each year. {Source: NHLBI Information Center, April 6, 2009}

Unique among major cardiac disorders, Heart Failure is becoming more widespread. Rapid growth in the elderly population, improvements in healthcare that enable people to live longer and the obesity epidemic are major contributing factors to the increase in the incidence of this disease.

A Need for Improved Performance

Heart Failure is a chronic disease. Optimal medical outcomes occur when clinical excellence is combined with patients who are sufficiently educated and motivated to comply with their long-term medication therapies, and who are willing to make necessary behavioral and lifestyle changes. Proper patient education and comprehension is paramount. It is important that patients learn about their diagnosis during their hospital stay and fully understand, accept and embrace the vital role they will play in

managing their condition post discharge.

Our nation's experience in managing Heart Failure to date has not been good.

- Heart Failure remains among the lowest performing core measures nationwide;
- Length of stay continues to grow;
- Today, nearly one-quarter of Heart Failure patients nationwide are readmitted within 30 days of discharge. This readmission rate has tripled in the last 25 years;
- According to AHRQ, a significant percentage of these readmissions could be avoided if patients complied better with their post-discharge Care Plan.

{Source: AHRQ Report on Medicare Compliance, Volume 17, Number 24, June 30, 2008.}

A study published in the February 2009 Annals of Internal Medicine (funded by AHRQ) demonstrates that quality patient education prior to discharge reduces readmissions.

- According to the study, patients who have a clear understanding of their after-hospital care instructions, including how to take their medicines and when to make follow-up appointments, are 30 percent less likely to be readmitted or visit the emergency department than patients who lack this information.
- The study also found that total costs were an average of \$412 lower for the patients who received complete information than for those who did not.

According to a study published in the Journal of the American College of Cardiology, (Volume 39, Issue 1, Pages 83-89, H.Krumholz), targeted patient education and support intervention for heart failure patients resulted in a 39 percent decrease in the total number of readmissions and a reduction in hospital readmission costs of \$7,515 per patient.

HF Readmission Rates – A National Health Priority

Nationally, the high 30-day HF readmission rate has become a major focus of attention among health policy makers, payers and providers. There are financial, as well as patient care quality considerations for hospitals as they seek to improve performance in this area:

- The Centers for Medicare & Medicaid Services (CMS) may soon deny or limit Medicare payment for readmissions that are deemed to be avoidable;
- The National Quality Forum (NQF) has identified “30-day all-cause risk standardization readmission rate following Heart Failure hospitalization” as one of its consensus standards.

There is a growing consensus that dramatically reducing HF readmission rates, and improving clinical outcomes is an urgent national health priority.

The Sentara Virginia Beach General Hospital Experience

Sentara Virginia Beach General Hospital (SVBGH) is a 282-bed, not-for-profit, acute care center located in Virginia Beach, VA. SVBGH is tertiary referral center

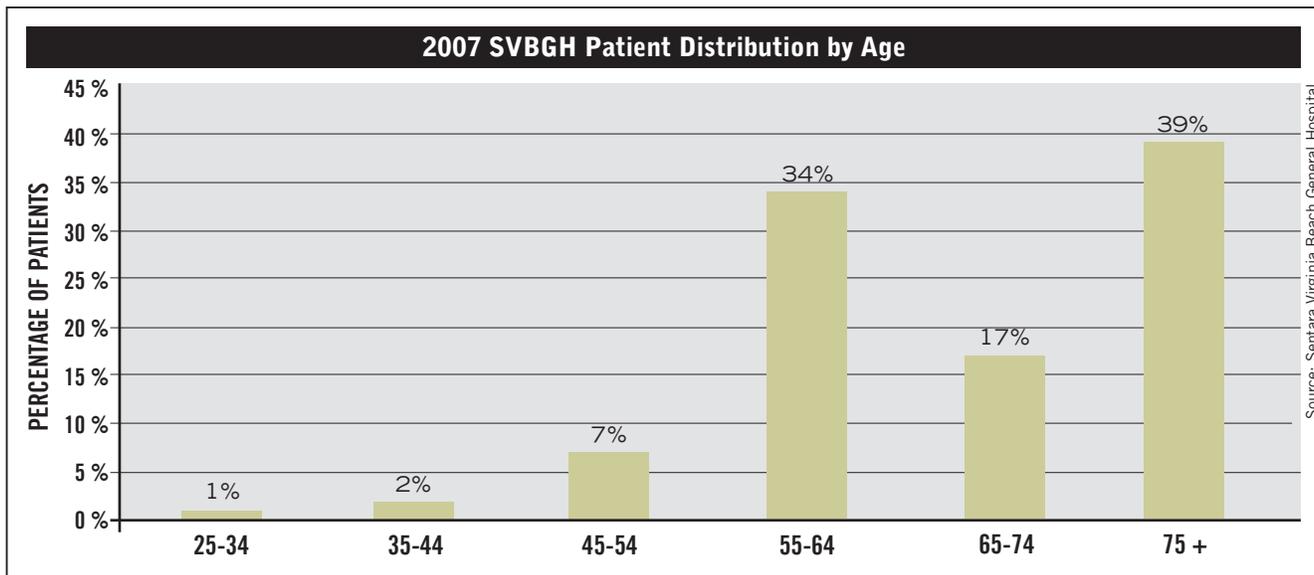
with a Level III Trauma Center and Centers of Excellence in Cardiac, Neuroscience, Orthopedics, Oncology and Women’s and Children’s services. SVBGH is part of the Sentara Health System, a seven-hospital integrated delivery network located throughout Southeastern Virginia.

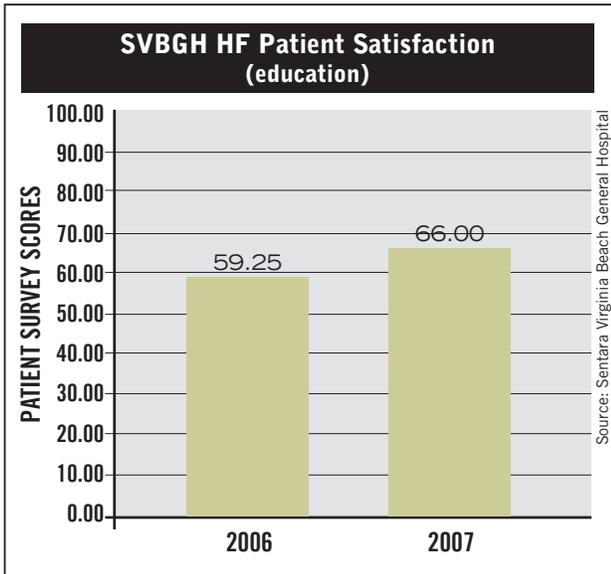
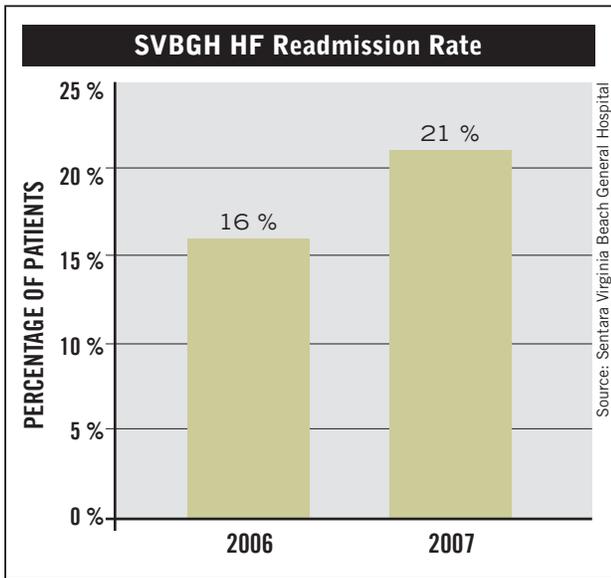
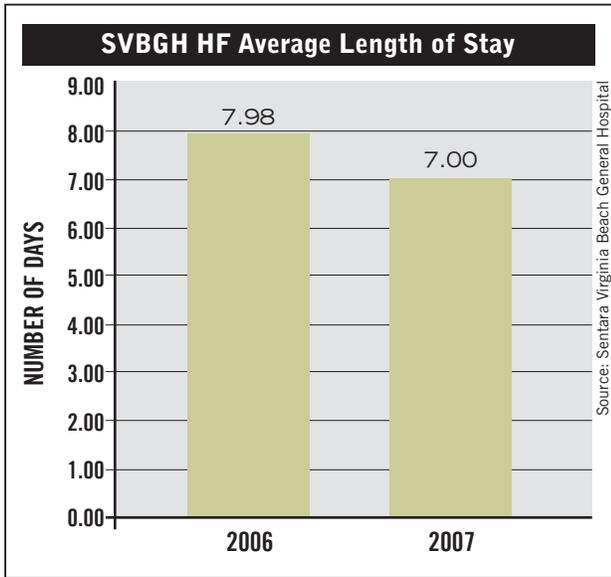
SVBGH is a patient-centered care facility and was an early adapter of Interactive Patient Care technology, having partnered with GetWellNetwork in 2004.

SVBGH’s experience with Heart Failure had been typical for a hospital of its size and demographics. The hospital is situated in an older, resort community, and admits nearly 500 HF patients per year. SVBGH has a higher proportion of younger patients admitted with HF. In fact, nearly 40% of its HF patients are aged 55 – 64.

Growth and Performance Drive Change

During the period 2006-2007, SVBGH’s Heart Failure length of stay approached 8 days. Patient satisfaction with the quality of medical discharge education averaged 66 on a scale of 1-100 (with a hospital goal of 90) during the same period. The hospital’s overall Heart Failure readmission rate was 16.4% in 2006 and 20.8% in 2007, lower than the overall national average.





In general, patient satisfaction with their experience is as much a measurement of the quality of care processes as it is the quality of the service experience. Often patient concerns over aspects of their care (e.g. “taught about medication side effects”) are a good indication of the need for process improvement.

SVBGH faced common patient satisfaction concerns with the quality of the education process. In particular, SVBGH heard the following concerns from its HF patients regarding their education:

- I waited too long before nurse reviewed my discharge instructions;
- Too much information at discharge;
- After I got home, I couldn’t remember a lot of the information;
- Didn’t feel like reading my written instructions.

Historical data on length of stay, readmission rate and patient satisfaction for SVBGH Heart Failure patients is shown in the tables on to the left.

Commitment to Advance Quality

Faced with a growing HF patient population, Sentara Virginia Beach General Hospital had the need and the commitment to advance quality, service, length of stay, and cost performance.

SVBGH’s performance needs are common to hospitals nationwide. As with most hospitals, SVBGH faced the following challenges:

- Nursing constraints limited the time available to complete education with the patient, often leaving education until the day of discharge.
- Reviewing all of the HF discharge instructions at discharge took approximately one hour which led to information overload by the patient.
- SVBGH provided a high quality comprehensive educational packet to the patient on the day of discharge to take home, read and learn more

about their condition. Nurses reported that patients showed disinterest when information was reviewed with them.

- While a common approach, this less than interactive approach to care limited:
 - Nurses' ability to assess patient completion and comprehension of the education provided;
 - Patient demonstration of engagement and motivation to make behavioral and lifestyle modifications;
 - Patients' ability to demonstrate competency in monitoring symptoms;
 - Patients' preparation and commitment to lifestyle changes to be made at home.

“Patients reported being confused and overwhelmed with the amount of medical literature that was being presented to them at the end of their stay,” says Audrey Douglas-Cooke, RN, MS, director, Cardiac/Critical Patient Care Services at SVBGH. “Many reported that they did not carefully read these materials and those who read them, did not fully understand them, but had no recourse to learn more, as they had already been discharged.”

SVBGH's IPC Solution

SVBGH committed early on to engage patients through Interactive Patient Care technology with the belief that the more actively the patient and family were engaged in their care, the better the outcomes. SVBGH utilized the GetWellNetwork® PatientLife System® to drive performance changes in patient satisfaction, patient understanding and involvement in safety management, and in patient education, including efforts to advance core measures compliance with smoking cessation education.

“The GWN Team from their senior leadership to on-site staff collaborated with the SVBGH Cardiac Team to quickly begin development and formalizing a cohesive plan to address the above issues,” said Douglas-Cooke.

Given the impact of Interactive Patient Care on patient outcomes and hospital performance, SVBGH saw an opportunity to use this technology to improve Heart Failure outcomes and performance. SVBGH envisioned a more advanced use of the GetWellNetwork PatientLife System that would provide multiple solutions to a multifaceted problem.

About GetWellNetwork

In 1999, based on his own experience as a cancer survivor, GetWellNetwork CEO and founder Michael O'Neil developed a concept called Interactive Patient Care (IPC) and a company focused on improving outcomes through patient engagement. GetWellNetwork's PatientLife System® is a software workflow engine that transforms the bedside television into an interactive resource to provide personalized medical information, education and communications tools. Based on the premise that a more educated, involved patient is a better patient, the impact of IPC is first felt by patients and then measured by hospitals through improved cost performance, quality, and patient satisfaction.

Development of the Heart Failure Interactive Care Plan

Working closely with the GetWellNetwork Team, SVBGH leadership developed a four-step Heart Failure Interactive Patient Care Plan that would facilitate active patient engagement in their care process starting on the day of admission. The Care Plan was designed to use the entire stay of the patient to educate them about their condition and in particular, to best prepare them with discharge instruction and tools to be successful.

This plan leverages the industry-leading capabilities of GetWellNetwork’s workflow engine. This proprietary workflow technology, known as Patient Pathways®, applies “push-pull” capabilities to effectively facilitate patient participation in their care as well as provide nursing the competency and assessment data needed to evaluate patient progress. The workflow capability was the foundation on which a series of care process steps were defined and built to create the Heart Failure Interactive Care Plan.

Using this technology, education, information and interventions are “pushed” to the patient via the television at the most appropriate point during their stay and then data demonstrating patient completion, comprehension and competency are “pulled” using various tools enabling nursing to evaluate patient status and progress real-time throughout their Care Plan.

Some of the benefits of the Patient Pathways technology include:

- Beginning on admission, patients can proceed through the Care Plan at their own pace and according to their own ability, to complete key steps in their care process;
- Nursing has the ability to repeat or reactivate steps in the care process where the patient did not demonstrate the desired level of competency and completion;
- The push capability has demonstrated impact on increasing patient engagement and education completion;
- Evaluations can be built in to continuously assess the patient’s comprehension of information provided;
- The Pathway engine improves nursing workflow efficiency because of the effect of actively engaging patient participation and because of the real-time feedback provided as a result of patient completion of the steps throughout their Care Plan.

The development and use of the HF Interactive Care Plan as a primary care delivery tool also helped to standardize the hospital’s approach to Heart Failure care and to ensure that best practices are followed in every case. Further, the tools in the Care Plan were designed to empower and motivate patients to be responsible for learning about their condition and how to manage their condition once they leave the hospital.

Team and Design Process

SVBGH established an interdisciplinary team comprised of representatives from its physician and nursing staffs, as well as representatives from clinical and patient education, pharmacy, information technology, the nutrition team, and representation from GetWellNetwork to design the elements of the HF Interactive Care Plan. The interdisciplinary team was led by Audrey Douglas-Cooke, director, Cardiac and Critical Patient Care Services and Lee Kanter, MD, cardiologist and currently president of the SVBGH medical staff. The team based the design work on the clinical guideline for Heart Failure care that was in place at SVBGH, identifying those points in the prescribed care process appropriate for patient engagement.

The team designed the Care Plan to meet the following outcomes goals and objectives:

- **GOAL #1:** Reduce the average length of stay for SVBGH Heart Failure patients.
 - **Objective:** Utilize each HF patient’s full length of stay to better educate, inform and engage all patients along each step of the HF Interactive Patient Care Plan.
- **GOAL #2:** Reduce the 30-day readmission rate for SVBGH Heart Failure patients.
 - **Objective:** improve the preparation of HF patients for discharge by ensuring that competency and lifestyle tools are in place and delivered to patients in a consistent and automated fashion.

- **GOAL #3:** Increase Heart Failure patient satisfaction and comprehension with preparation for discharge instructions.

- **Objective:** Utilize GetWellNetwork technology to ensure that patients are adequately informed and motivated to understand their disease and maintain behavioral changes that will lead to better outcomes.

Early in the design phase, the SVBGH Heart Failure Interactive Patient Care Team established the following key measures for success, and agreed that this new Care Plan would accomplish the following:

- Assess patient readiness to learn;
- Assess and re-assess each patient’s motivational state at the beginning and the end of hospitalization;
- Engage each patient, to seek and obtain buy-in to accept responsibility for care;
- Use technology to engage patients for heightened compliance;
- Measure patient acceptance and responsibility for medications;
- Gauge patient ability to articulate what new medications they are taking, the role and importance of each, as well as side-effect and untoward reaction information;
- Confirm overall patient understanding of Heart Failure;
- Confirm that patients are educated on test results associated with HF (echo tests, cardiac catheterization, stress tests, etc.);
- Ensure that all patients are able to articulate their responsibilities once discharged;
- Collect data and measure outcomes.

The table below shows the development timeline for the design of the Care Plan.

Development Timeline - HF Interactive Patient Care Team	
TASK	DATE
Develop work groups	May 25, 2006
Develop goals and objectives for each work group	June 10, 2006
Create a four-day Pathway for each work group	June 17, 2006
Based on SVBGH criteria, standardize definition of HF	June 17, 2006
Incorporate each work group into one cohesive template	July 1, 2006
Develop tools to assess patient’s readiness to learn	July 15, 2006
Develop tools to assess patient’s literacy level	July 15, 2006
Develop tools to assess patient’s level of motivation	July 15, 2006
Build out each day’s components based on GWN criteria	August 1, 2006
Develop a draft of HF Interactive Care Plan	October 2006

Once completed, the design was used by a team of GetWellNetwork engineers, led by Cheryl Gnehm, vice president, professional services and Robin Cavanaugh, chief technology officer, to build the framework, pathways, applications and content for the HF Care Plan. The Care Plan was completed, tested and piloted and then launched at SVBGH on March 1, 2008.

The Sentara Virginia Beach Heart Failure Interactive Patient Care Plan

The design resulted in a four-stage Interactive Care Plan that included the following major elements:

1. Literacy and motivation assessments;
2. Education and comprehension assessments about Heart Failure;
3. Teaching on medications (including medication history), tests and procedures;
4. Compliance education including safety and smoking cessation;

5. Teaching and competency assessment on signs and symptoms monitoring;
6. Evaluate post discharge support system and requirements;
7. Tools that empower the patient to take responsibility for their condition.

The four stages and respective elements of the Care Plan are shown in the chart below.

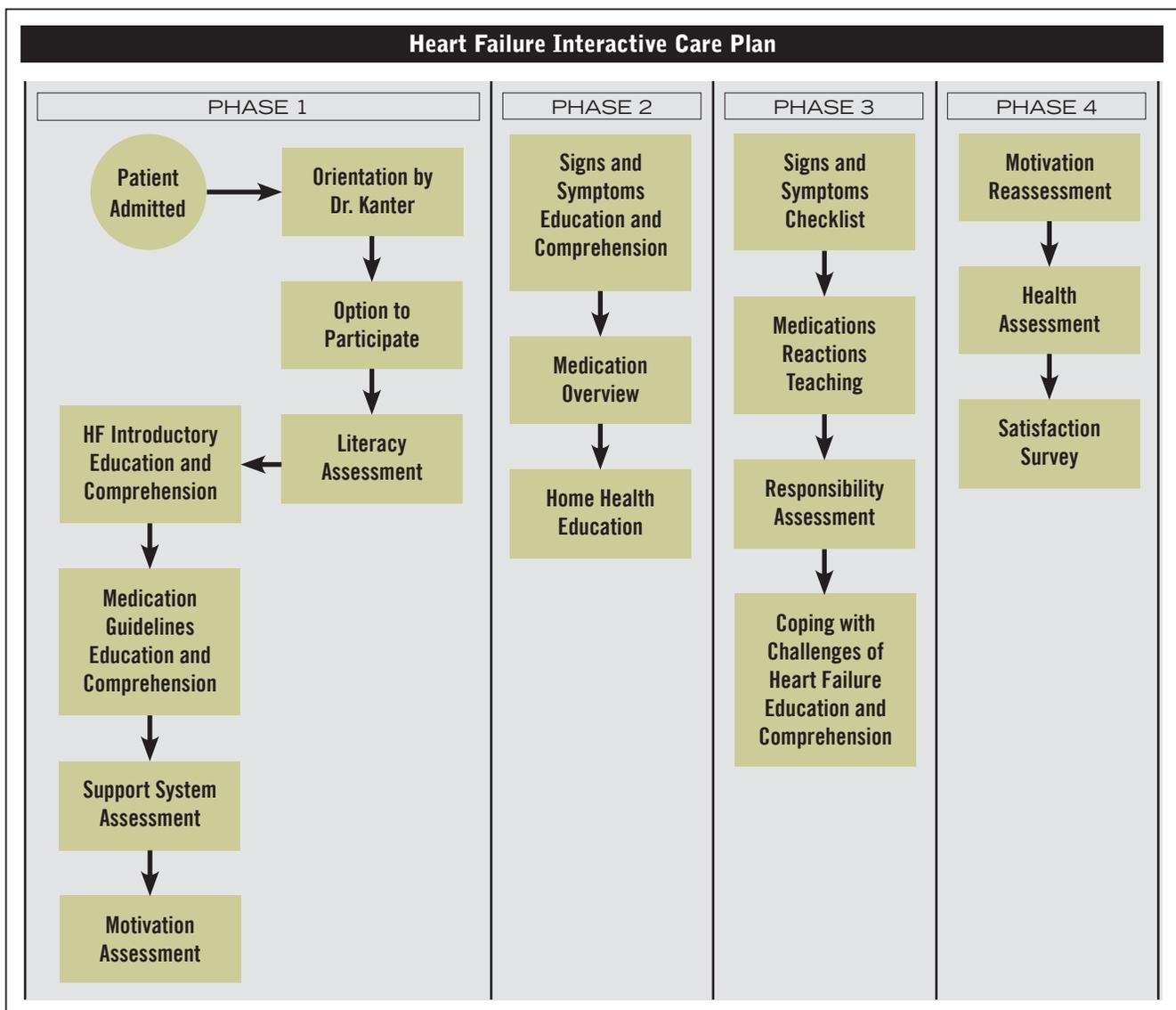
The design team also created key elements of content to encourage patient acceptance of responsibility for the care and management of their condition. In particular, the design team created three survey instruments used

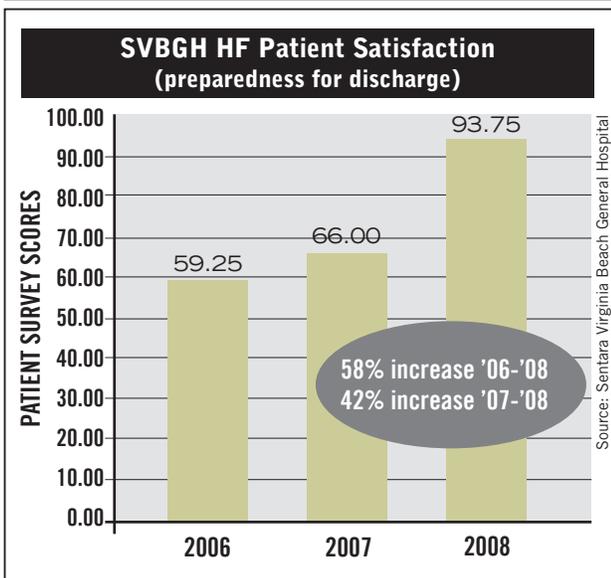
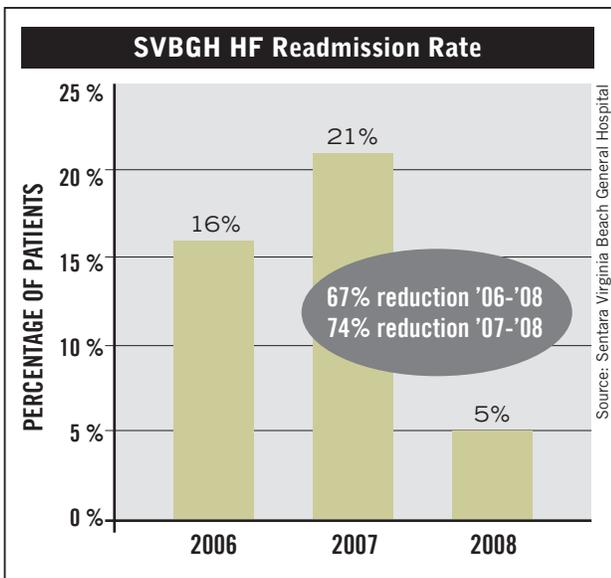
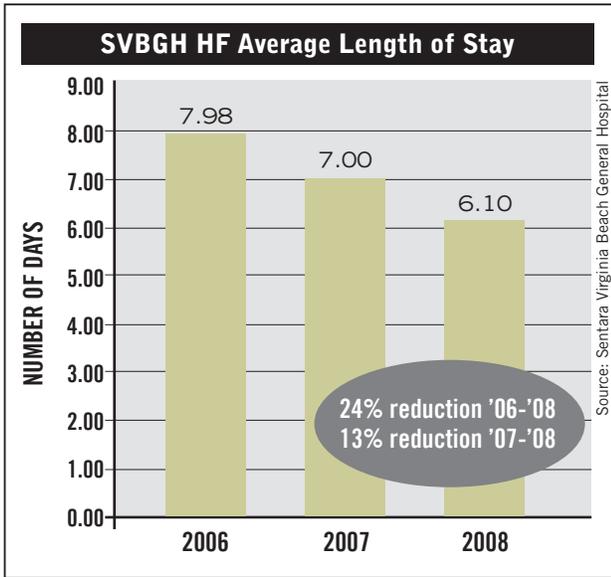
throughout the Care Plan to determine patient literacy levels, motivation and competency.

Integration into the Care Process

Upon admission, the hospital staff determines if a patient admitted for Heart Failure is appropriate to be placed on the HF Interactive Care Plan. If so, hospital staff orients the patient to the GetWellNetwork PatientLife System, and prescribes the HF Interactive Care Plan through the GetWellNetwork Management Console.

Once the Pathway is launched, the patient is immediately assessed for literacy and motivation to further determine their candidacy for the Care Plan. Once a Care Plan





participant, patients are then introduced to the HF Care Plan in a video by Dr. Kanter. Then, in chronological order, patients are navigated through key concepts in Heart Failure care, through on-screen prompts, videos and automated interactions throughout their stay. Simultaneously, nursing is able to monitor and measure patient compliance in real time, as well as reinforce education efforts in those areas where comprehension is not present or is undocumented.

Nursing routinely monitors where each Heart Failure patient is and their status on the Interactive Care Plan using a dashboard application in the Management Console. At any point in time, based on the patient assessments, nursing can pause or even stop the Plan and have the patient repeat prior steps to ensure understanding and optimal preparation for discharge.

Demonstrated Outcomes

Results after just one year of experience with SVBGH's Heart Failure Interactive Care Plan have been significant. Sentara Virginia Beach General Hospital has realized substantial outcomes improvements in all three key areas targeted for measurement. These improvements are shown in tables to the left.

- **The average Heart Failure readmission rate 30 days post-discharge dropped from 20.8% in 2007, to 5.4% in 2008, representing a 74% reduction in readmission rates.**
- **Average patient length of stay, noted at 7.98 days in 2006 and 7.0 days in 2007, was measured at 6.1 days for HF patients in FY 08. This marks a 24% reduction in average length of stay from 2006 and a 13% reduction from 2007.**
- **Patient satisfaction with the quality of their medical education has spiked dramatically, rising from 59.3 (scale of 1-100) in FY 06 and 66.0 in FY 07, to 93.8 in FY 08. Patient satisfaction with education increased 43% after roll-out of the Heart Failure Interactive Care Plan.**

Reduction in ALOS	2007	2008
Total numbers of HF patients	480	480
ALOS	7.00	6.10
Patient days	3,360	2,898
Average cost per day	\$ 1,925	\$ 1,925
Total annual cost	\$ 6,468,317	\$ 5,636,676
Reduction in patient days		432
REDUCTION IN ANNUAL COST		\$ 831,641

Source: All referenced data provided by Sentara Virginia Beach General Hospital, with the exception of cost per case and cost per day; source, Agency for Health Research and Quality Healthcare Cost and Utilization Project (AHRQ HCUPnet) 2006.

Readmission Rates	2007	2008
Heart Failure	21.0 %	5.0 %
Average cost per case	\$ 10,203	\$ 10,203
Total number of HF discharges	480	480
Total numbers of readmissions	101	24
Total cost of HF readmissions	\$ 1,028,462	\$ 244,872
Reduction in readmissions		77
POTENTIAL NET IMPACT		\$ 783,590

Source: All referenced data provided by Sentara Virginia Beach General Hospital, with the exception of cost per case and cost per day; source, Agency for Health Research and Quality Healthcare Cost and Utilization Project (AHRQ HCUPnet) 2006.

expected total annual cost savings is estimated at **\$831,641** with the 0.9 day reduction in average length of stay between 2007 and 2008.

Readmission Rates

Heart Failure readmissions are expected to be named a ‘Never Event’ in 2009 by the Centers for Medicaid and Medicare Services. Once that occurs, Medicare will no longer reimburse the hospital for Heart Failure patients readmitted within 30 days of initial discharge. With that in mind, the expected financial impact resulting from the 74 % reduction in readmission rates experienced by SVBGH in 2008 is **estimated to be \$783,590** when applying national average cost per case.

The change in performance between 2007 and 2008, when the HF Interactive Care Plan was fully in place, was significant. When applying national averages on cost per day and cost per case, **the total potential financial impact approaches \$1.6 million in cost savings per year.**

Next Steps

SVBGH is planning to build on the success of its Heart Failure Interactive Care Plan in a number of ways:

- A continuation of HF data analysis for FY 09 including determination of the financial impact of this sustained performance improvement;
- Expand training beyond cardiologists to additional physician and allied staff to utilize the Interactive Care Plan (examples: hospitalists who also admit HF patients, providing unit secretaries with more tools to better assist nursing staff, etc);
- A close examination what other disease entities will benefit from increased patient engagement and standardization of best practices through GetWellNetwork’s IPC technology;

Cost Impact of Performance Improvement

Literature supports that operating costs, particularly cost per case will decline as the quality of the care process improves. The majority of Heart Failure patients are Medicare beneficiaries and therefore, the hospital is reimbursed using a case rate based on the DRG. Therefore, any reduction in length of stay will directly impact the hospital’s average cost per case for this population of patients.

Average Length of Stay

When applying national average inpatient cost per day for HF patients (Source: AHRQ HCUPnet) to the reduction in average length of stay for SVBGH HF patients, **the**

- Sharing these outstanding – and replicable – SVBGH Heart Failure outcomes with other hospitals nationwide that are looking to improve on Heart Failure performance outcomes.

Summary

This case study exemplifies the notion that patient engagement is a core strategy for performance improvement. Heart Failure is one of the most common reasons for hospitalization today and will only continue to grow. It is also a condition that requires the patient to take responsibility for ongoing monitoring and management of symptoms which necessitates an understanding of their condition, medication compliance and a commitment to lifestyle change. Like most chronic conditions, HF requires the patient to be an active participant in their care.

Interactive Patient Care has become known as one of the most effective means to engage patients in their hospital care process. As demonstrated in this case study, when patients are actively and effectively engaged and empowered to take part in their healthcare – the results are outstanding.

Sentara Virginia Beach General Hospital demonstrated its commitment to putting the patient first and its progressiveness with its innovation in the design and development of the HF Interactive Care Plan. An organization already committed to patient centeredness and, as an early adopter of Interactive Patient Care Technology, SVBGH was well equipped to advance its use of the GetWellNetwork PatientLife System to drive meaningful change in quality, service and financial performance.



About Sentara Virginia Beach General Hospital

Sentara Virginia Beach General Hospital (SVBGH) is a 282-bed not-for-profit, acute care center located in Virginia Beach, VA. SVGBH is tertiary referral center with a Level III Trauma Center and Centers of Excellence in Cardiac, Neuroscience, Orthopedics, Oncology and Women's and Children's services. SVBGH is part of the Sentara Health System, a seven-hospital integrated delivery network located throughout Southeastern Virginia.



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About GetWellNetwork, Inc.

GetWellNetwork, Inc. is a leading provider of Interactive Patient Care (IPC) solutions. In partnership with leading hospitals and healthcare systems across the United States, the company delivers innovative technology and services to drive optimal patient outcomes. Empowering patients as active participants in the healthcare process, IPC solutions are patient-centric applications delivered at the point-of-care to ensure the completion of service and quality requirements, while driving new revenue opportunities and operational efficiencies for healthcare providers. GetWellNetwork and its clients have been widely acknowledged for their IPC innovations by the healthcare community. In 2007, the GetWellNetwork solution received the exclusive endorsement of the American Hospital Association (AHA). GetWellNetwork, Inc. headquarters are in Bethesda, Maryland.

For more information regarding this white paper or the SVBGH Heart Failure Care Plan, please contact David Wright, Chief Outcomes Officer at GetWellNetwork at dwright@getwellnetwork.com.

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