Telehealth for Chronic Care Management

With CMS looking closely at CHF hospital readmissions within 30 days, have you considered the reimbursement loss risk for your organization in 2010?
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The World Health Organization reports that chronic disease is responsible for 60 percent of all deaths worldwide\(^1\). The U.S. Department of Health and Human Services Agency for Healthcare Research and Quality (AHRQ) estimates that treating the nation’s ten most expensive medical conditions cost nearly $500 billion in 2005\(^2\). Heart conditions were the most expensive health conditions to treat. According to a 2006 estimate, approximately 5.7 million people suffer from congestive heart failure (CHF) in the United States\(^3\). About 30 percent of these individuals, 1.59 million patients, are Class III and Class IV heart failure patients\(^4\). The lifetime risk of developing heart failure at the age of 40 is 20 percent, and approximately 380,000 people above the age of 65 will be diagnosed with CHF annually\(^5\). Heart failure is also the leading cause of hospitalization in people older than age 65. The demographic “over age 65” from the Baby Boomer generation will likely give rise to increased numbers of heart failure patients during the next few decades\(^6\).

Congestive Heart Failure: Cost Implications

The healthcare community is increasingly concerned with the growing number of patients hospitalized with heart failure. CHF was listed as the underlying cause in 57,120 deaths in 2004\(^7\). In 2006, over 1.1 million CHF patients were discharged from a hospital\(^8\). Studies show that within four to six months after discharge, 47 percent of the patients are likely to be readmitted to the hospital\(^9\). In a comprehensive review of more than 13 million Medicare patients discharged from 4,926 hospitals between 2003 and 2004, almost 27 percent of heart failure patients were rehospitalized within 30 days of discharge\(^10\).

Figure 1 shows the total direct and indirect costs of heart failure in the United States is estimated to be $37.2 billion\(^11\). In commercially insured Medicare and Medicaid populations, the single largest health expenditure is inpatient utilization (nearly 33 percent in 2005) with 13.3 percent of all emergency department visits associated with a hospital admission\(^12\). In 2006 the Colorado Hospital Association compiled detailed hospitalization cost data for all patient refined diagnosis related group (APR-DRG 194) heart failure. Based on 6,305 CHF hospitalizations at 44 Colorado hospitals in 2006, the average daily cost for hospitalization was $4,873 (Figure 2) and the average length of stay (LOS) was 4.76 days\(^13\) (Figure 3). LOS is the key determinant of cost for heart failure hospitalizations\(^14\). In addition, the referenced Colorado study found that 87 percent of the patients with APR-DRG 194 were hospitalized with either moderate or major severity, roughly equating to Class II and Class III CHF (Figure 4).
Figure 2: Average CHF Hospitalization Charge/Day
Colorado Hospital Association, 2007

Figure 3: Average LOS for CHF Hospitalizations (n = 6305; 44 hospitals)
Colorado Hospital Association, 2007

Figure 4: Breakout of 6305 CHF Hospitalizations by Class
Colorado Hospital Association, 2007
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Chronic Care Crossroads: What Reimbursement Policy Changes Mean for Hospitals and Healthcare Organizations
The Centers for Medicare & Medicaid Services (CMS) has quietly shifted policy in a way that may arguably reshape the U.S. health care system. In 2009, Medicare will require hospitals to report readmissions within 30 days of discharge for patients with three major medical diagnoses: heart failure, pneumonia and acute myocardial infarction.

For CMS, readmissions are an indicator of quality failure. Jencks et al estimated that 90 percent of unplanned readmissions within 30 days of discharge are unplanned and that the cost to Medicare for these unplanned readmissions in 2004 was $17.4 billion. Beginning in 2010, reimbursement for these readmissions may be modified or denied. Heart failure ranks first among all causes of Medicare discharges. A typical DRG reimbursement for heart failure would be approximately $4,800 based on national averages. In a review of cost data, the average hospital lost $1,288 per HF patient. If the CMS policy regarding early hospital readmissions is enacted in 2010, a typical 250-bed hospital faces a loss of annual reimbursement of about $1.5 million.

…we are focused on reducing unnecessary hospitalization to both remain competitive financially and also improve the health of our members.
Michael Sherman, M.D., Corporate Medical Director, Physician Strategies, Humana

Implications for the CMS policy shift regarding early rehospitalizations is not just limited to hospitals – the large healthcare providers or managed care organizations are also taking notice. Dr. Michael Sherman, M.D., serves as corporate medical director, physician strategies, for Humana based in Louisville, Kentucky. “As we see CMS seek to reduce the rate of increase in healthcare spending, we are also looking at likely reductions in what the government pays to organizations like Humana for managing the Medicare Advantage population,” he said. “Accordingly, we are focused on reducing unnecessary hospitalizations in order to both remain competitive financially and also improve the health of our members.”

The Solution: Implementation of a Scalable Telehealth Program
Fortunately, a cost-effective solution is available for heart failure patients. The Framingham Heart Study, begun in 1948 and completed in 1966, was the first landmark study that focused on the epidemiology of hypertensive or arteriosclerotic cardiovascular disease. Among the many findings, the data from the study showed that heart failure patients who experienced slight increases in weight and blood pressure levels over time would likely experience negative medical outcomes including hospitalization. Therefore, it is reasonable to conclude that if the patient’s objective biometrics – such as weight and blood pressure – could be monitored and reviewed by a clinician on a daily basis, the patient could receive immediate medical intervention, which may help prevent an expensive ER visit or hospital episode.

A recent study conducted by the Center for Connected Health, a division of Partners HealthCare, suggests that a well-designed remote patient monitoring program may help reduce early rehospitalization rates and emergency room visits for heart failure patients. The study included 42 heart failure patients admitted to Massachusetts General Hospital in Boston. The patients, averaging age 70, were randomized to receive usual care for heart failure and a follow-up on all patients was conducted three months after monitoring was initiated. Patients in the remote monitoring group experienced lower average hospital readmission rates (31 readmissions per 100 people) compared to patients in usual care (38 readmissions per 100 people) and non-participants (45 readmissions per 100 people). Patients in the remote monitoring group also had fewer heart-failure related readmissions and emergency room visits than usual care and non-participating patients. Researchers said the results...
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show a positive trend but are based on only three months of follow-up and did not reach statistical significance. A previous study by the Massachusetts-based group showed a similar program reduced all-cause hospital admissions by 25 percent in participating homebound patients21.

Telehealth Implementation Success Case Studies

Implementing remote patient management through a scaled telehealth program is one solution to the problem of high rehospitalization rates for CHF and other chronic patients. Hospital systems and integrated healthcare delivery networks (IDNs) can help mitigate potential reimbursement shortfalls through the implementation of a well designed telehealth program if CMS policy on early readmissions takes place. Many hospitals and IDNs are already utilizing telehealth monitoring of chronic patients to improve clinical outcomes and to reduce costs.

Honeywell Homed, the market leader in providing telehealth and remote patient monitoring solutions, has successfully assisted more than 650 customers in implementing a telehealth program. One example is Allegan General Hospital in Allegan, Michigan. In 2005, Allegan Homecare created a telehealth program using the Honeywell HomMed remote patient monitoring equipment. Telehealth monitors were given to all CHF patients, chronic obstructive pulmonary disease (COPD) patients recovering from open heart surgeries and patients with a history of hypertension. While enhancing patient care was initially the goal of the program, Allegan quickly realized impressive movements in operational capacity and financial performance. The telehealth program allowed Allegan to increase patient census by 25 percent in three years and become the third most profitable area in the hospital. Dale Chapman, Director of Patient Services at Allegan, noted, “We’re providing better patient care, significantly reducing the number of nurse visits required per episode and increasing the productivity of nurses, making us more profitable than we ever have been.”

Another successful telehealth program implementation example is Carolinas Healthcare System (CHS). CHS owns, leases or manages 25 hospitals in North and South Carolina. The System generated more than $4.1B in revenue in 2008. CHS sought to improve patient outcomes, reduce rehospitalizations, decrease hospital stays for patients and reduce costs for providing healthcare services. CHS decided on providing a scalable telehealth solution to improve patient outcomes and reduce costs to provide care. CHS liked the web-based Honeywell HomMed LifeStream™ remote patient care system because it could provide a highly standardized program across their entire network, bringing greater efficiencies, standardization, and clinical data sharing.

Currently CHS has 360 Honeywell remote patient monitors and the program has been a success. Marla Nutting, Telehealth Administrator at Valdese Hospital, a part of the CHS system located in Rutherford College, NC, noted, “Since we started using the
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telemonitors at our home service, we’ve seen more than a 500 percent return on investment. In addition, our rehospitalization rates have fallen from 30 percent to below 25 percent.”

These referenced case studies offer support that a well-designed and properly implemented telehealth program may help to improve patient outcomes, reduce rehospitalizations of patients with chronic conditions, and reduce costs. These benefits may become even more important given the current shift in CMS policy regarding early rehospitalizations for CHF and other diseases which may result in a significant loss of reimbursement revenue to hospitals and hospital systems. To improve patient care and outcomes and help mitigate reimbursement risk associated with the new CMS policy shift, implementing a well-designed, scalable telehealth program is a feasible and cost-effective solution that healthcare organizations must consider.

**Estimating the Economic Benefit of a Telehealth Program**

In light of the referenced CMS policy shift, healthcare executives may be faced with a significant DRG risk associated with early CHF rehospitalizations. Results from telehealth clinical studies suggest positive, directional trends regarding reductions in hospitalizations and ER visits. Honeywell HomMed has created a proforma financial modeling tool to help customers estimate the DRG reimbursement dollars at risk by the recent shift in policy at CMS and the potential economic benefit of implementing a well-designed, scalable telehealth solution.

The proprietary Honeywell proforma tool is a high-level, financial model that can be used to estimate the investment required to implement a scaled telehealth program and the long-term financial cost savings associated with such a program. The proforma tool first estimates the providers’ cost to care for CHF patients based on the number of annual hospitalizations. The model then estimates the cost savings derived from a well designed telehealth program based on data from published and proprietary clinical studies. Implementing a telehealth program will require an investment in monitoring equipment, clinical software, and clinical patient oversight. These costs are included in the model and subtracted from the benefits provided to yield a net economic benefit estimate for the customer. The net benefit estimate of the telehealth program implementation is summarized as a return on investment (ROI) calculation. In addition, the Honeywell proprietary proforma model presents the healthcare provider with an estimate of the DRG reimbursement monies for CHF patient hospitalizations that may be “at risk” based on the percentage of early rehospitalizations.

**Case 1: Small Integrated Health Care Network (IDN)**

This case looks at a typical small integrated health care network (IDN) provider with 2,500 CHF hospitalizations per year. This IDN will have approximately $16.25M in DRG reimbursement dollars at risk based on CHF early rehospitalizations over a five year period.

The proforma model estimates that if a small IDN with 2,500 annual CHF patient hospitalizations implemented a telehealth program scaled up to monitor 1,000 patients each year, the IDN may realize a net economic benefit of $14.2M dollars over the five-year period, representing an ROI of approximately 183 percent (Figure 4). Note that by implementing a modest telehealth program, the model estimates that the IDN used in this example would likely reduce its DRG risk for early CHF rehospitalizations by 25% percent, or approximately $4M.

**Case 2: Mid-size Hospital**

This case looks at a typical mid-size hospital with 500 CHF hospitalizations per year. This hospital will have approximately $3.2M in DRG reimbursement dollars at risk based on CHF early rehospitalizations over a five year period.
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The proforma model estimates that if a mid-sized hospital with 500 annual CHF patient hospitalizations implemented a telehealth program scaled up to monitor 250 patients each year, the hospital may realize a net economic benefit of over $5.4M dollars over a five-year period, representing a ROI of approximately 161 percent. Note that by implementing a modest telehealth program, the model estimates that the hospital used in this example would likely reduce its DRG risk for early CHF rehospitalizations by 28 percent, or $900K.

**Summary**

The number of patients suffering from chronic diseases like congestive heart failure is growing at an alarming rate. The recent shift in policy by CMS regarding early rehospitalizations poses the threat of lost reimbursement for hospitals and healthcare organizations. Numerous clinical studies have demonstrated encouraging directional results suggesting that remote patient monitoring helps reduce hospitalizations, ER visits, and total costs. Therefore, CMS policy and recent healthcare industry discussions on the concept of “medical home” suggest an increased awareness on the part of the healthcare community in providing patient care in new ways and through new channels.

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Dr. Kristopher Crawford, M.D., president of Physicians Preferred Monitoring, LLC has observed how these trends are impacting the healthcare market. “Patients routinely utilize multiple medical Web portals to get information to self manage illnesses,” said Dr. Crawford. “It is not a stretch to see them utilizing the same methods to get a live health professional to further assist them in managing their illnesses, especially chronic conditions. When you tie this social shift to home telemonitoring devices that give practitioners the objective data that is necessary to compile a more complete clinical picture, you have a situation where virtual care is not just likely but really inevitable.”

"Enhanced control of difficult to manage CHF and diabetic patients is an obvious first step toward cost containment through increased levels of wellness."

Kris Crawford, M.D., President, Physicians Preferred Monitoring, LLC

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**Figure 5: Hospital System/IDN Case – 5-year Economic Benefit from Telehealth**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>CHF Hospitalizations</td>
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</tr>
<tr>
<td>Lives Covered by Telehealth</td>
<td>1000</td>
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<tr>
<td>DRG at Risk ($M)</td>
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<tr>
<td>Net Economic Benefit</td>
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<tr>
<td>Program Costs</td>
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<td>Net Economic Benefit</td>
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<td>Net Economic Benefit</td>
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<tr>
<td>ROI</td>
<td>183%</td>
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<tr>
<td>ROI</td>
<td>182%</td>
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</table>
Powerful market forces such as the aging Baby Boomer segment, shortage of physicians, and potential loss of reimbursement for early rehospitalizations for CHF patients will shape healthcare systems’ decisions on how to provide care for the chronically ill. “Primary care physicians are vanishing even as demand for their services grows with an aging American population,” said Dr. Crawford. “These shortages and other issues will drive home care delivered through in-home health appliances in combination with enhanced self-monitoring and self care. Costs in the health care system are largely and increasingly driven by a few chronic disease states. Enhanced control of difficult to manage CHF and diabetic patients is an obvious first step toward cost containment through the increased levels of wellness.”

If you would like to better understand your DRG risk for early CHF hospital readmissions and learn more about how implementing a scaled, telehealth solution may help your organization reduce costs and improve patient outcomes, you may request a free, custom Honeywell Proforma financial tool assessment for your hospital, IDN, or hospital system by contacting:

**Honeywell HomMed**

3400 InterTech Drive • Suite 200
Brookfield, WI 53045 • 1-888-353-5440
HomMed.Marketing@Honeywell.com

To learn more about Honeywell HomMed’s remote patient care product and service offerings please contact a representative at 1-888-353-5440 or email us at HomMed.Marketing@Honeywell.com.

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**Figure 6: Mid-size Hospital Case – 5-year Economic Benefit from Telehealth**

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<table>
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<td>Telehealth Savings</td>
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<td>Program Costs</td>
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<td>250</td>
<td>Lives Covered by Telehealth</td>
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<td>$2.3</td>
<td>DRG at Risk ($M)</td>
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<tr>
<td>161%</td>
<td>ROI</td>
<td></td>
</tr>
<tr>
<td>156%</td>
<td>ROI</td>
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About Honeywell HomMed
Honeywell International (www.honeywell.com) is a Fortune 100 diversified technology and manufacturing leader, serving customers worldwide with aerospace products and services; control technologies for buildings, homes and industry; automotive products; turbochargers; and specialty materials. Based in Morris Township, N.J., Honeywell’s shares are traded on the New York, London, and Chicago Stock Exchanges. For more news and information on Honeywell, please visit www.honeywellnow.com.

Honeywell HomMed is part of the Honeywell Automation and Control Solutions business group, a global leader in providing product and service solutions that improve efficiency and profitability, support regulatory compliance, and maintain safe, comfortable environments in homes, buildings and industry. For more information about Honeywell HomMed, please visit www.hommed.com.

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