

# Evidence-Based Heart Failure Quality Improvement Programs & Strategies for Critical Access Hospitals

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*This brief is one in a series of policy briefs identifying and assessing evidence-based patient safety and quality improvement interventions appropriate for use by state Flex Programs and Critical Access Hospitals (CAHs).*

## Introduction

This policy brief focuses on evidence-based heart failure Quality Improvement (QI) programs and strategies that are applicable to CAHs. The Flex Monitoring Team prepared this brief as part of a larger project whose purpose is 1) to identify successful evidence-based quality improvement (QI) programs and strategies related to acute myocardial infarction (AMI), pneumonia, heart failure and surgical care improvement that could be replicated in CAHs and 2) to disseminate information about these programs and strategies to State Flex Programs.

## Background

QI programs can encompass a wide range of strategies, and many QI interventions include multiple strategies, which has made it difficult to evaluate their effectiveness. There is a growing awareness that QI strategies need to rest on a strong evidence base, and that greater attention needs to be paid to understanding why particular interventions work and the factors that affect their success in different settings.<sup>1-3</sup>

### *Importance to CAHs and the Flex Program*

Improving the quality of care provided by CAHs is an important goal of the Medicare Rural Hospital Flexibility (Flex) Program. Throughout the Flex Program, CAHs have implemented a range of QI activities with support from their State Flex Programs, as documented by previous Flex Monitoring Team CAH surveys and case studies.<sup>4-6</sup> Support for QI in CAHs is a core activity area of focus in the current Flex Program Guidance, and the Flex Program has implemented a new special project, the Medicare Beneficiary Quality Improvement Project (MBQIP). MBQIP is focused on Medicare beneficiary health status improvement, and is being implemented in three phases. The first phase that is currently underway is focused on improving inpatient heart failure and

## Key Findings

- Few articles in the peer-reviewed literature evaluate the effectiveness of quality improvement (QI) programs for heart failure specifically for Critical Access Hospitals (CAHs).
- The majority of articles on heart failure QI programs focus on the American Heart Association's *Get with the Guidelines* program and the CMS/Joint Commission heart failure quality measures. Multiple partners collaborated to implement these programs, including Quality Improvement Organizations, State Flex Programs, State Hospital Associations, Universities, the Institute for Healthcare Improvement, the American Heart Association, health systems and other state and local partners.
- The heart failure QI programs primarily focus on: 1) providing evidence-based care to inpatients; 2) engaging patients and families as active partners; and 3) creating processes to ensure a quality handoff.
- Several QI strategies have been shown to improve heart failure care and are potentially replicable in CAHs.

pneumonia measures, which makes it especially important to identify successful QI programs that can be replicated in CAHs.

Heart failure and AMI, along with pneumonia, are among the most common conditions treated in CAHs. Over the last five years, CAHs have improved their overall performance on publicly reported inpatient process of care quality measures for these three conditions, and for surgical care improvement measures. However, CAH performance continues to lag behind that of rural and urban Prospective Payment System hospitals, particularly on the AMI and heart failure measures. In addition, there is considerable variation in quality performance among CAHs, with some hospitals performing well, and others needing much more improvement.

### Approach

We reviewed and synthesized several types of literature on QI programs and strategies, including articles in peer-reviewed healthcare journals and reports from a variety of public and private organizations working on QI issues in hospitals. The focus of this literature review and synthesis was on initiatives to improve care for congestive heart failure or heart failure. We sought to identify programs and strategies that have been successfully implemented in small rural hospitals, as well as other programs and strategies that hold promise for adoption in the small rural hospital environment because the type of resources used to implement them are generally available to CAHs. A literature review on heart failure prepared by the Oklahoma Foundation for Medical Quality was a valuable resource.<sup>7</sup>

To help identify additional QI programs and strategies that have not been documented in the literature, we consulted with members of the Flex Monitoring Team Expert Work Group, including State Flex Coordinators and CAH administrators, and reviewed information from State Flex Grant Applications compiled by the Technical Assistance Services Center (TASC). As needed, we also contacted sponsoring organizations to provide supplemental information on participant characteristics and QI methods and strategies used.

### Results

Numerous studies have demonstrated that specific components of heart failure care can reduce

morbidity and/or mortality.<sup>8-9</sup> Recently, it has been demonstrated that hospitals receiving performance recognition under the American Heart Association's (AHA) "Get With The Guidelines" (GWTG) have modestly lower risk adjusted mortality rates than non-recognized hospitals.<sup>10</sup> Optimal management of heart failure in older adults is becoming a pressing issue as the population of the U.S. ages.<sup>11</sup> Heart failure is the underlying reason for 12 to 15 million office visits and 6.5 million hospital admissions each year.<sup>12</sup>

The American Heart Association, American College of Cardiology, Joint Commission, Institute of Healthcare Improvement, and the Advisory Committee on Immunization Practices recognize seven key components of heart failure patient care. The components are tailored to the patient's clinical condition and comorbidities and are recommended for all patients with heart failure, in the absence of contraindications or intolerance.<sup>13</sup> The first four components are also addressed in the CMS/Joint Commission heart failure quality measures. The components include:

- Left ventricular systolic (LVS) function assessment
- Angiotensin-converting enzyme (ACE) inhibitor or Angiotensin receptor blockers (ARB) at discharge for heart failure patients with systolic dysfunction
- Smoking cessation advice and counseling<sup>a</sup>
- Discharge instructions that address all of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen
- Anticoagulation at discharge for heart failure patients with chronic or recurrent atrial fibrillation
- Influenza immunization (seasonal)<sup>a</sup>
- Pneumococcal immunization<sup>a</sup>

Hospital QI programs to improve heart failure care have primarily focused on three phases of care. The phases include: 1) providing evidence-based medical care to inpatients with heart failure; 2) engaging heart failure patients and their families as active partners in care; and 3) creating reliable processes that ensure a proper handoff to the caregivers who will provide follow-up care.

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<sup>a</sup>As of January 2012, CMS retired the Hospital Compare heart failure smoking cessation advice measure. CMS has adopted global influenza and pneumococcal vaccination measures and the Joint Commission has adopted a set of global tobacco cessation measures. These global measures apply to eligible patients with heart failure as well as other medical conditions.

Figure 1 lists tools and resources useful in improving these three phases of care

The programs and strategies for improving heart failure care that were identified in peer-reviewed literature, and through reports from QIOs or other state or national organizations are summarized by category below (the numbers after each program or strategy refer to the references that follow). Table 1 includes additional information about these programs/strategies, sponsoring organizations, program details and results, and the extent to which they included CAHs and other small rural hospitals.

### ***QI Programs/Strategies focused on providing reliable evidence-based medical care in hospitals***

- Identification of inpatient and outpatient heart failure patients at risk through disease management registries, and which trigger alerts and reminders on admission that the patient has heart failure and requires automatic implementation of standard orders.<sup>14,15,17-19,27-29,33,35-37,45</sup>
- Support for physician/nursing/pharmacy champions such as providing pocket cards with heart failure evidence-based intervention for staff to carry for effective staff education regarding heart failure interventions.<sup>14,16,17-19,22,24,45</sup>
- Concurrent review process to identify patients who have not received all the evidence-based care and provides real-time performance feedback to staff.<sup>15,28,29,45</sup>
- Use of healthcare coordinators to ensure effective and consistent communication within the care team.<sup>19,28,32,34,38</sup>

### ***QI Programs/Strategies focused on engaging heart failure patients and their families***

- Use evidence-based techniques across the continuum to engage patients and families in self-management support.<sup>18,20,23,28,32,38,40</sup>
- Give concerns of the patient and family top priority for assessment and teaching objectives by assessing patient and caregiver learning styles and needs.<sup>28,38,45</sup>
- Standard heart failure patient education materials designed according to plain-language standards and coordinated across disciplines and settings.<sup>18-20,28,38,43-45</sup>
- Self-care management monitoring (real-time data feedback).<sup>27,31,35,41</sup>

### ***QI Programs/Strategies focused on creating reliable processes that ensure a proper handoff for continuing care at home***

- Begin discharge process upon admission – identify the heart failure patient's primary care physician and establish contact; begin assessment of patient needs; begin education process with patient and family, include standard medication forms and uniform discharge instructions.<sup>14,17,18-20,28,29,39</sup>
- Establish/strengthen partnerships with primary care physicians, home health agencies, and local pharmacies to ensure standard messages. Use care management team to coordinate care and facilitate handoffs.<sup>14,17,18,22-24,26,29,30,32,39,45</sup>
- Assure seamless handoff that includes real-time communication, outpatient appointment, or formal contact within 48 hours.<sup>28,29,34,39</sup>

### **Conclusions**

While few articles in the peer-reviewed literature have evaluated the effectiveness of heart failure QI programs specifically for CAHs, several QI programs and strategies have been shown to improve heart failure care in hospitals and are potentially replicable in CAHs from admission through post-discharge.

### ***How can State Flex Programs help CAHs?***

State Flex programs can assist CAHs in improving outcomes for heart failure measures by:

- Encouraging CAHs to use the evidence-based programs, tools and resources highlighted in this policy brief;
- Providing technical assistance and support to assist CAHs in implementing evidence-based QI activities;
- Encouraging CAHs to benchmark their performance against other CAHs;
- Fostering collaborative relationships between CAHs and QIOs; and
- Encouraging CAHs to participate in MBQIP, Partnership for Patients and other quality and patient safety initiatives.

**Figure 1. Tools and Resources for Heart Failure Quality Improvement**

## TOOLS AND RESOURCES

### **Early identification and education of heart failure admissions**

The 5 Million Lives Getting Started Kit: Congestive Heart Failure Supplement for Rural Hospitals provides processes to improve early identification of CHF patients, which prompts appropriate care orders, self-care information on admission and care management post-discharge. <http://www.ihl.org/IHI/Programs/Campaign/CHF.htm>

### **Tools for safe care at the bedside**

Launched in 2003, Transforming Care at the Bedside (TCAB) is a national program of the Robert Wood Johnson Foundation (RWJF) and the Institute for Healthcare Improvement (IHI). TCAB is not a traditional quality improvement program; one primary characteristic that sets it apart is its focus on engaging front-line staff and unit managers to develop innovations and exemplary care models on medical and surgical units to dramatically improve patient outcomes. The TCAB How-to Guide aims to “create an ideal transition home” and highlights 1) four key components of an ideal transition home and specifies individual changes that can be tested; 2) a practical step-by-step sequence of activities to assist staff in testing and adapting many of the proposed changes described in 1); and 3) includes tools, resources, practical “real-world” tips, examples from hospitals, and case studies of hospitals that have implemented many of the changes proposed in this guide. Currently, hundreds of hospitals across the US and internationally are implementing TCAB strategies and changes on medical and surgical units. “Transforming Care at the Bedside How-to Guide: Creating an Ideal Transition Home for Patients with Heart Failure. IHI, 2008 <http://www.ihl.org>

### **Tools for a safe transition home**

AHRQ’s “Transition Home Program Reduces Readmissions for Heart Failure” incorporates a number of components to ensure patients a safe transition to home or another health care setting, including enhanced assessment of post discharge needs at admission, thorough patient and caregiver education, patient-centered communication with subsequent caregivers at handoffs, and a standardized process for post acute care follow up. <http://www.innovations.ahrq.gov/content.aspx?id=2206>

### **Follow-up tools to prevent heart failure readmission**

The American Heart Association – Heart Failure Fact Sheet: 30-Day Measures. Get With The Guidelines collaborative quality improvement program provides hospitals with a Web-based Patient Management Tool™ (powered by Outcome Sciences, Inc.), decision support, robust registry, real-time benchmarking capabilities and other performance improvement methodologies toward the goal of enhancing patient outcomes and saving lives. The tool includes a 30-day form from the AHA that allows hospitals to capture patient data (such as mortality, re-hospitalization, follow-up visits, medication adherence, rehabilitation, patient education, etc.) in the 30-day period after hospitalization.

[http://www.heart.org/idc/groups/heart-public/@wcm/@private/@hcm/@gwtg/documents/downloadable/ucm\\_310967.pdf](http://www.heart.org/idc/groups/heart-public/@wcm/@private/@hcm/@gwtg/documents/downloadable/ucm_310967.pdf)

### **American Health Quality Association. State Quality Improvement Efforts.**

This site describes State Quality Improvement Efforts implemented by Quality Improvement Organizations (QIOs) to help providers across the country adopt best practices.

[http://www.ahqa.org/pub/quality/161\\_1101\\_5339.cfm?CFID=107198988&CFTOKEN=91338421](http://www.ahqa.org/pub/quality/161_1101_5339.cfm?CFID=107198988&CFTOKEN=91338421)

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#### **Additional Information**

This policy brief is available at [www.flexmonitoring.org](http://www.flexmonitoring.org).

For more information about this study, please contact Walt Gregg [gregg006@umn.edu](mailto:gregg006@umn.edu)

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**Table 1: Evidence-Based Heart Failure QI Programs/Strategies**

<b>Measures Addressed/ Strategies Used</b>	<b>Sponsoring Organizations</b>	<b>Program Description</b>	<b>Results</b>	<b>Applicability for CAHs/small rural hospitals</b>	<b>Citations</b>
<p><u>Measures addressed:</u> Assessment of LVF discharge instructions</p> <p><u>Strategies used:</u> Multidisciplinary teams and rapid cycle improvement techniques</p>	<p>CMS Health Care Quality Improvement Program and Stratis Health (Minnesota QIO) and Minnesota State Flex Program</p>	<p>Used multi- disciplinary hospital teams composed of a physician, a nurse, a pharmacist, and senior management sponsor to implement rapid cycle improvement tools and measurement methodologies for heart failure and atrial fibrillation (AF) patients.</p>	<p>In 2001 – 2002 participating hospitals showed aggregate improvement in the assessment of left ventricular function by 50%, and a 75% improvement in patient education at discharge. 50% of the hospitals showed improvement in one or both areas (heart failure and AF).</p>	<p>Strategy was designed for CAHs. During 2001-2004 the QIO worked with 32 CAHs in Minnesota.</p>	<p>AHQA <sup>8</sup></p>
<p><u>Measures addressed:</u> ACEI administration, discharge instructions</p> <p><u>Strategies used:</u> Protocols, orders, enhanced communication, collaboration.</p>	<p>CMS Health Care Quality Improvement Program, the Iowa Foundation for Medical Care (QIO), and Fort Madison Community Hospital</p>	<p>Fort Madison Hospital began by looking at discharge instructions provided to heart patients. Case managers developed protocols and orders to enhance communication and collaboration among team members, emphasize resource utilization, and emphasize education of the patient and family.</p>	<p>During 2000 – 2001 the proportion of heart failure patients receiving discharge instructions was 50%. By 2001 – 2002 the proportion of heart failure patients increased to 95%.</p> <p>Provision of ACE inhibitors for heart failure improved from 58% to 98% over the same period.</p>	<p>Fort Madison Community Hospital is a 50 bed rural hospital. The strategy should be adaptable to smaller facilities and CAHs.</p>	<p>AHQA <sup>8</sup></p>

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Measures Addressed/ Strategies Used	Sponsoring Organizations	Program Description	Results	Applicability for CAHs/small rural hospitals	Citations
<p><u>Measures addressed:</u> ACEI administration, LVF assessment, Discharge Instructions</p> <p><u>Strategies used:</u> Provider support and tools, information systems tracking</p>	<p>Intermountain Healthcare and University of Utah School of Medicine</p>	<ul style="list-style-type: none"> <li>• Joint Commission heart failure measures were implemented in 20-hospital health care system. A total of 2958 discharged heart failure patients were included in the study.</li> <li>• Nurse case managers were employed to ensure that providers complied with core measures before patient discharge and to contact patients twice in the first month post-discharge to reinforce self-care instructions</li> <li>• Implementation efforts included provider education/support, patient education, and information systems for data tracking. Standardized educational tools for provider/ patients were developed by a multidisciplinary heart failure team with liaison teams in each hospital to oversee the local process.</li> <li>• MAWDS stands for               <ul style="list-style-type: none"> <li>– Take your Medications</li> <li>– Stay Active each day</li> <li>– Weigh yourself each day</li> <li>– Follow your Diet and</li> <li>– Recognize your Symptoms</li> </ul> </li> </ul>	<p>One-year survival benefits were seen in an item-by-item evaluation of heart failure measures for angiotensin-converting enzyme inhibitor/angiotensin receptor blocker therapy (hazard ratio [HR] = 0.69), left ventricular function assessment (HR = 0.83), and patient education (HR = 0.79). When assessed collectively, improved survival was seen among patients eligible for two (HR = 0.53), three (HR = 0.36), or four heart failure measures (HR = 0.65). An incremental relationship was found between the degree of adherence and survival (p =.008).</p> <p>Adherence to heart failure core guidelines is associated with improved 1-year survival after heart failure hospitalization.</p>	<p>Five of the twenty hospitals in the study are CAHs.</p>	<p>Kfoury, A. et. al., 2008<sup>14</sup></p> <p>For additional information (self-management with MAWDS a quick reference for heart failure patients)</p> <p><a href="https://intermountainhealthcare.org/ext/Dcmnt?ncid=51061748">https://intermountainhealthcare.org/ext/Dcmnt?ncid=51061748</a></p>

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<p><u>Measures addressed:</u> Discharge instructions</p> <p><u>Strategies used:</u> Protocols, measurement, altered accountability</p>	<p>CMS Health Care Quality Improvement Program and the Louisiana Health Care Review (LA-QIO) and Eunice Community Medical Center</p>	<ul style="list-style-type: none"> <li>• The QIO provided QI support to Eunice Community Memorial Hospital by providing pre-existing protocols, and encouraging hospital unit managers to become responsible for abstracting records and tracking their own progress.</li> <li>• Hospital leadership took advantage of resources offered through the QIO such as pre-existing protocols, and adopted the philosophy of accountability promotion. The unit managers became responsible for abstracting records and tracking their own progress over time.</li> </ul>	<p>Proportion of heart failure patients receiving discharge instructions increased from 20% to 62.5% in six month period.</p>	<p>Eunice Community Hospital is a 90 bed rural facility</p>	<p>AHQA <sup>8</sup></p>

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<p><u>Measures addressed:</u> Discharge instructions, smoking cessation, ACEI administration</p> <p><u>Strategies used:</u> Process management, data collection and measurement, staff reminders to follow heart failure guidelines</p>	<p>CMS Health Care Quality Improvement Program and Health Care Excel (IN-QIO), Indiana State Office of Rural Health, Indiana Chapter of American Heart Association, Indiana Rural Health Association and Rush Memorial Hospital (CAH)</p>	<ul style="list-style-type: none"> <li>During 2005 – 2008, technical assistance was provided to CAHs to help them utilize the AHA patient management tool “Get with the Guidelines,” which was purchased with state grant funds. Rush Memorial Hospital received support in developing pathways, discharge instructions, and educational materials including guideline reminders on identified HF patients. Assistance, provided primarily through weekly conference calls and emails, supported the leadership of the emergency room director and medical surgical manager in developing the in-house initiative.</li> </ul>	<ul style="list-style-type: none"> <li>During a one year period between 2006 and 2007 Rush Memorial Hospital realized the following achievements:                             <ul style="list-style-type: none"> <li>– The proportion of heart failure patients discharged with written instructions improved from 20% to 80%;</li> <li>– Heart failure patients receiving smoking cessation counseling increased from 40% to 100%; and</li> <li>– Heart failure patients (with LV ejection fraction less the 40%) receiving angiotensin converting enzyme inhibitor increased from 75% to 100%.</li> </ul> </li> </ul>	<p>Rush Memorial Hospital is a 25 bed CAH. Strategy is replicable and could be used by other state QIOs to work with CAHs in their state(s). Successfully implemented in 10 CAHs.</p>	<p>Pagan-Sutton, J., Silver, L., and Gupta, J., 2009<sup>15</sup></p>

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Measures Addressed/ Strategies Used	Sponsoring Organizations	Program Description	Results	Applicability for CAHs/small rural hospitals	Citations
<p><u>Measures addressed:</u> All heart failure measures</p> <p><u>Strategies used:</u> “Get With the Guidelines - Heart Failure”</p>	<p>American Heart Association “Get With the Guidelines - Heart Failure”</p>	<ul style="list-style-type: none"> <li>• A voluntary quality initiative that uses a Web-based Patient Management Tool (PMT, Outcomes Sciences Inc., Cambridge, MA) to collect clinical data, provides decision support, and provides real-time online reporting features. The PMT is intended for point-of-care and/or chart-review data collection by trained personnel and uses standardized data elements.</li> <li>• According to Peterson, et. al., the GWTG-heart failure risk score can easily be calculated at the bedside and for hospitals participating in the GWTG-heart failure program; individual prediction of risk of in-hospital death is automatically calculated when admission data is entered into the GWTG tool.</li> </ul>	<ul style="list-style-type: none"> <li>• In one study involving 198 hospitals and cohort of 39,783 patients, GWTG – heart failure was identified as a validated tool for risk stratification that is applicable to a broad spectrum of patients with heart failure, including those with preserved left ventricular systolic function.</li> </ul>	<ul style="list-style-type: none"> <li>• GWTG-heart failure is an appropriate program for small rural hospitals and has demonstrated value for improving patient quality of care and outcomes.</li> </ul>	<p>Peterson, P. et. al., 2010<sup>21</sup></p> <p>A GWTG tool box designed to help hospitals implement the guidelines is available at <a href="http://www.heart.org/HEARTORG/H ealthcareResearch/GetWithTheGuidelinesheart failureStroke/Get WithTheGuidelines HeartFailureHomePage/Get-With-The-Guidelines-Heart-Failure-Toolbox_UCM_307815_Article.jsp">http://www.heart.org/HEARTORG/H ealthcareResearch/GetWithTheGuidelinesheart failureStroke/Get WithTheGuidelines HeartFailureHomePage/Get-With-The-Guidelines-Heart-Failure-Toolbox_UCM_307815_Article.jsp</a></p>

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<p><u>Measures addressed:</u> All heart failure measures</p> <p><u>Strategies used:</u> Best practice resource tools and staff feedback</p>	<p>Aurora St. Luke’s Medical Center, Milwaukee, WI</p>	<ul style="list-style-type: none"> <li>• By using heart failure best practice resource tools and positive feedback for learning opportunities, caregivers have been more consistent with the heart failure care and documentation.</li> <li>• When core measures are not met, the appropriate staff (MD, RN) is notified via e-mail letters. The nurses receive information specific to non-compliance and an educational poster to prevent the compliance failure.</li> </ul>	<ul style="list-style-type: none"> <li>• Prior to the use of these tools, the hospital’s non-compliance rate for following best practice guidelines was 24% (Apr 08 – June 08). After implementing the resource tools the heart failure guidelines non-compliance rate dropped to 6.7% (Apr 09 – June 09).</li> </ul>	<p>Although Aurora St. Luke’s is a large urban hospital, the use of reproducible resource tool sets on heart failure best practice guidelines and positive feedback for staff is appropriate and within the resource constraints of a small hospital setting.</p>	<p>Singer, N., Willman, J., Penzkowski, D. , 2009<sup>16</sup></p>
<p><u>Measures addressed:</u> Readmission prevention, Discharge instructions</p> <p><u>Strategies used:</u> Use of community pharmacists to assist in outpatient management</p>	<p>University Hospital, London Ontario, University of Western Ontario, University of Toronto, and McMaster University</p>	<ul style="list-style-type: none"> <li>• A personalized intervention delivered by community pharmacists to discharged patients with heart failure. The pharmacist provided counseling on the patient’s medications with emphasis on heart failure and cardiac medications and strategies to enhance compliance.</li> </ul>	<ul style="list-style-type: none"> <li>• Goal is improvement in medication compliance in discharged heart failure patients. Outcome measures include: readmissions, emergency room visits, mortality due to heart failure.</li> <li>• The article describes the study design; results are not yet available.</li> </ul>	<p>The impact of including pharmacists in patient care and disease management can be significant. Rural communities with available pharmacists could benefit from their inclusion in patient care teams following discharge.</p>	<p>Rich, M., 1999<sup>24</sup>  Bogden, P et. al., 1998<sup>25</sup></p>

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<p><u>Measures Addressed:</u> Readmission prevention</p> <p><u>Strategies used:</u> Medication counseling</p>	<p>Brody School of Medicine East Carolina University Greenville NC and Pitt County Memorial Hospital, Greenville NC</p>	<ul style="list-style-type: none"> <li>• Patient counseling and subsidized medications were provided to rural under-insured and low income discharged heart failure patients. Patients contracted to meet monthly with a clinical pharmacist for medication counseling, assessment of adherence and understanding of prescribed medication regimen, and provision of required medications.</li> </ul>	<p>After a 12 month intervention period with 28 previously readmitted patients:</p> <ul style="list-style-type: none"> <li>• Readmits went from 22 to 1</li> <li>• Total hospital costs went from \$149,148 to \$3,164</li> <li>• Total cost per patient went from \$5,326 to \$2,645 (includes costs for providing medications)</li> <li>• Improved Beta blocker usage from 93% to 96%</li> <li>• Improved Angiotensin antagonist use from 89% to 100%</li> <li>• Improved Aldosterone antagonist use from 32% to 68%</li> </ul>	<p>Depending on the availability of clinical pharmacists, CAHs when enrolled in a medication subsidy program (340B) may be able to provide medications at low or no cost and reduce readmissions in heart failure patients.</p>	<p>Mayo et. al. , 2006<sup>22</sup></p>

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<p><u>Measures addressed:</u> Readmission prevention, discharge instructions</p> <p><u>Strategies used:</u> Staff education on home management, rapid cycle improvement, chart reminder</p>	<p>Institute for Healthcare Improvement 5 Million Lives Campaign and Cleveland Regional Medical Center, NC</p>	<ul style="list-style-type: none"> <li>Systems management began with clinical benchmarking and instituted rapid cycle performance improvement which was focused on staff education chart review, provider feedback and performance improvement opportunities.</li> <li>A CHF survival kit used at admission assessed the level of patient understanding</li> </ul>	<ul style="list-style-type: none"> <li>Over the period of one year, the hospital's readmission rate for heart failure patients declined by 37%, its heart failure mortality rate decreased by 25%, and the proportion of heart failure patients receiving appropriate discharge instructions increased to 96%.</li> </ul>	<p>Cleveland Regional is a 233 bed rural hospital. Systems improvement, assessment and feedback are replicable in small rural hospitals.</p>	<p>Howell, N., and Kniceley, C. 2007<sup>44</sup></p>

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<p><u>Measures addressed:</u> Discharge instructions</p> <p><u>Strategies used:</u> Leadership development, tools such as checklists and order sets, and multidisciplinary staff rounds</p>	<p>Berkshire Medical Center, AHA, ASA GWTG</p>	<ul style="list-style-type: none"> <li>• Use of multidisciplinary teams to implement GWTG modules.</li> <li>• Three techniques contributed to their success: 1) identification and nurturing of leadership in all disciplines, 2) fostering a culture that promotes a passion for perfection for every patient, and 3) development of a system of tools such as checklists, order sets, and electronic medical records and redundancy within these systems.</li> <li>• Multidisciplinary rounds consisted of house staff, hospitalists, nursing from all floors, quality improvement, pharmacy, case management, diabetes counseling and other clinical disciplines meeting each day to review each patient's care.</li> </ul>	<ul style="list-style-type: none"> <li>• The hospital received the AHA Performance Achievement Award, sustaining 85% or above adherence to performance measures for heart failure.</li> </ul>	<p>Berkshire Medical Center is a rural 300 bed community hospital.</p> <p>Multidisciplinary teams are common practice in CAHs. These can be implemented in small rural hospitals.</p>	<p>AHA, 2005<sup>23</sup></p>

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<p><u>Measures addressed:</u> Discharge Instructions</p> <p><u>Strategies used:</u> Alert forms, reminder memos, staff education, new policies regarding medication profiles</p>	<p>Baylor Health Care System, Texas; Jefferson Medical College, Pennsylvania</p>	<ul style="list-style-type: none"> <li>• The “Accelerating Best Care” QI education program developed by Baylor was implemented in two rural Pennsylvania hospitals in collaboration with Jefferson Medical College.</li> <li>• The 6 month training included methods for rapid-cycle improvement; data system design and management; tools to improve patient processes and outcomes of care; use of clinical guidelines and protocols.</li> <li>• CHF project included identification of HF patients, their discharge instruction needs, their pharmacy needs, and the medical staff’s responsibilities. Findings were shared with unit managers.</li> </ul>	<ul style="list-style-type: none"> <li>• Hazelton General Hospital heart failure readmission rate declined from 14.1% to 7.7% during the intervention period.</li> </ul>	<p>The hospital is rural but much larger than CAHs (150 beds). The tools and processes used would be applicable to smaller hospitals.</p>	<p>Andrews &amp; Valente, 2008.<sup>46</sup></p>

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<p><u>Measures addressed:</u> Discharge Instructions, ACEI/ARB use, beta blocker use at discharge, heart failure appropriate care measure</p> <p><u>Strategies Used</u> Disease-specific check lists at discharge, on-screen reminders using GWTG patient management tool, physician learning tools, conferences and list serve to share tools and lessons learned.</p>	<p>Virginia Health Quality Center (QIO), American Heart Association, American College of Cardiology</p>	<ul style="list-style-type: none"> <li>• Physician champions were recruited at each hospital.</li> <li>• Hospitals were encouraged to use a checklist called a discharge contract, to participate in the GWTG program and use the GWTG patient management tool.</li> <li>• Monthly teleconferences and face to face learning sessions were based on the IHI collaborative methods.</li> </ul>	<ul style="list-style-type: none"> <li>• Hospital participants had a higher rate of improvement in discharge instructions, ACEI/ARB use and beta-blocker use compared to non-participants</li> </ul>	<ul style="list-style-type: none"> <li>• 29 hospitals in VA participated, 5 of these were rural hospitals but only 2 had fewer than 100 beds.</li> <li>• Strategies used would be applicable for CAHs.</li> </ul>	<p>Brush et. al., 2009.<sup>47</sup></p>

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<p><u>Measures addressed:</u> All heart failure process measures</p> <p><u>Strategies used:</u> Benchmarking tool, rapid cycle educational intervention</p>	<p>Institute for Health Care Research and Improvement at Baylor Health Care System (Funded by AHRQ).</p>	<ul style="list-style-type: none"> <li>• A hospital randomized controlled trial that evaluated the effectiveness of a rapid-cycle clinical care process educational program on tools and techniques for implementing and evaluating QI initiatives.</li> <li>• Hospitals were randomized to receive: 1) a Web-based benchmarking tool only or 2) the tool plus a rapid-cycle educational intervention covering the basic techniques of designing, implementing, and monitoring a QI initiative.</li> </ul>	<ul style="list-style-type: none"> <li>• No significant differences were observed between the study group and the control group. The authors suggest that a twelve-month period for follow-up may not have been long enough to detect meaningful changes in organizational culture. A second follow-up evaluation is scheduled at year two.</li> </ul>	<ul style="list-style-type: none"> <li>• 47 rural and small community Texas hospitals; hospitals had to be located in a county in Texas with a population of &lt;10,000 or designated as a CAH as of 2004.</li> </ul>	<p>Filardo et. al., 2008<sup>42</sup></p> <p>Filardo et. al., 2009<sup>43</sup></p>