Heart failure (HF) is characterized by an inability of the heart to pump enough blood to the body. It affects nearly 5.8 million Americans, with 670,000 newly diagnosed cases annually. The disease is very debilitating, exacting a toll on the patient’s quality of life. In 2010, HF will cost the United States $39.2 billion (Lloyd-Jones et al., 2010). As the population in the United States ages, the prevalence of chronic diseases, including HF, will continue to increase (Mager & Madigan, 2010).

Athens Regional Home Health (ARHH) is a not-for-profit, hospital-based, Medicare-certified, and Joint Commission-accredited home care agency with an average daily census of 150 patients. Approximately 12% of these patients have HF either as a primary or secondary diagnosis, or as a complicating comorbidity. The agency serves a territory of approximately 1,100 square miles in a combined rural and urban Metropolitan Statistical Area in Athens, northeast of Atlanta, GA. Patients are referred to the agency following hospitalization for newly diagnosed HF or exacerbation after surgery following open-heart or other surgical procedures or from private physician offices. The average hospital length of stay does not usually afford the necessary time to prepare the patient or caregivers for the lifestyle changes necessary to effectively manage a complex disease such as HF. Patients are sometimes readmitted to the hospital or return to the emergency department (ED) before the home health agency has the opportunity to admit the patient for home healthcare. Many times patients are nonadherent to their plans of care with four or more hospital readmits annually.

In 2007, an increase in the acute hospitalization rate was noted. Eighty-nine patients

Sidebar 1. Definition of TM
TM: The process of using audio, video, and other telecommunications and electronic information processing technologies to monitor the health status of a patient from a distance (American Telemedicine Association, 8/2010).

Improving Heart Failure in Home Care with Chronic Disease Management and Telemonitoring

Pamela Hall, RN, MBA, and Mollie Morris, RN, BSN
were readmitted to the hospital from June to December 2007, with 21% (19 patients) receiving treatment for respiratory problems. A review of patient medical records revealed that the highest incidence of readmissions (12 patients) was due to HF exacerbation. Seventy-five percent (9 patients) were initially treated in the ED for fluid overload. The patients were treated with intravenous diuretics followed by hospital admission for stabilization.

Agency leadership hypothesized that earlier intervention to include a comprehensive, standardized approach to caring for these patients could prevent many of these emergent care and hospital readmissions. A performance improvement team was formed. Team membership (Table 1) included individuals with recognized knowledge and expertise, who had respect among peers or the ability to serve as liaison with the medical staff and the health system to educate and communicate the benefits of the program under development by home care. Key members from the health system were included to assure continuity of care in program planning and service implementation. This multidisciplinary and multidepartmental team gave credence to the development of this program through a collective provision of guidance and expertise.

The team initially researched the literature on care models and evidence-based practices that demonstrated the most promise toward improving care for HF patients while reducing hospitalizations. The 5 Million Lives Campaign How-to Guide: Improved Care for Patients with Heart Failure (Good Heart Failure, 2008) provided valuable initial guidance on seven key components of care (Table 2). Many of these practices were already in place in the inpatient HF management program, but lacked coordination or implementation in the home care setting. The team also learned the importance of implementing these measures consistently with all patients having primary HF as well as those displaying seemingly unrelated symptoms such as pneumonia or shortness of breath (Good Heart Failure, 2008).

The team met a total of 12 times over the course of 7 months. The knowledge gained through

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Table 1. Team Membership

**HF Disease Management Core Team Membership**

- Medical Director
- Executive Director (RN)
- Patient Services Nurse Manager (RN)
- Quality Services Manager (RN)
- RN Case Manager
- Occupational Therapist
- Physical Therapist
- Pharmacist
- Information Services Systems Analyst

**Ad-hoc Team Membership**

- Palliative Care Nurse (from Hospital System)
- Telephonic Heart Failure Support Coordinator (from Hospital System)
- Cardiac Rehabilitation Program Coordinator (from Outpatient Rehab Department)
- Agency Director of Business Operations
research and the assistance of the Medical Director (MD) was imperative as the team developed a chronic disease management protocol incorporating key best practices (Table 3). Education materials used in the hospital setting were adapted to meet the needs of the home care patient and were compiled into a 48-page book (Table 4). Patient selection criteria (Table 5) were established and policies and procedures written. A comprehensive training program was developed and presented to clinical staff, including registered nurses, physical therapists, occupational therapists (OTs), speech therapists (STs), and home health aides (HHAs). Education was provided in four 1-hour training sessions over the course of 2 months with review of key concepts during monthly staff meetings. Topics presented included concepts of chronic disease management in general, and in specific to HF, medication management, the role of the therapist, referral triggers to other disciplines including therapy and social work services, use of the standard HF care plan, how to use patient education materials, assessing the patient’s mental status to determine ability to learn, telemonitoring (TM) (Sidebar 1) integration, palliative care, process workflows, discharge planning with appropriate referrals to community resources (Table 6), and useful Web sites (Sidebar 2). Nurses received training in three additional classes for a total of 6 hours on how to use TM equipment and interpret patient vital sign data trends. Process flowcharts and decision trees were developed in the planning phase to assist staff with “Go-Live” procedures, installation of TM equipment in the patient’s home, daily operations, and TM removal procedures. These tools served not only as a means to identify changes required for policies, procedures, and processes but also as educational references following implementation. Three metrics of success were established for the program to include a reduction in the overall acute hospitalization and emergent care rate, as well as keeping 30-day hospital readmits for HF exacerbation at or below half of the national rate of 19.6%.

The team hypothesized from the outset that TM could help prevent HF exacerbations. However, literature searches and interviews with other home care agencies revealed that the most successful programs had integrated TM as only one tool in managing the HF patient (Randall, 2009). The team evaluated several TM systems using a predeveloped checklist to identify the system with

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**Table 2. Institute for Healthcare Improvement Key Components of Care**

- Left ventricular systolic heart function assessment,
- Angiotensin converting enzyme inhibitor or angiotensin receptor blockers at discharge for HF patients with systolic dysfunction,
- Anticoagulant at discharge for HF patients with chronic/recurrent atrial fibrillation,
- Influenza immunization (seasonal),
- Pneumococcal immunization,
- Smoking cessation counseling (if applicable), and
- Discharge instructions that address all of the following: activity level, diet, discharge medications, follow-up appointments, weight monitoring, and what to do if symptoms worsen.


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**Table 3. Best Practices**

- Use teach-back methods (patient teaches nurse what he has learned)
- Patient establishes goal, which drives the care plan
- Daily weight and vital signs
- Front-loading of visits
- Using pantry staples to teach good and bad food habits, and how to read labels
- Assess willingness to stop smoking (if applicable)
- Friday weekend “tuck-in” phone calls to assess need for weekend visit
- Follow up with continuing care providers—physician, palliative care, telephonic program
the best match to agency criteria (MedQIC, Home Health, 2005). It was during the equipment evaluation phase that the team discovered the benefits of chest fluid bioimpedance monitoring to identify chest fluid increases up to 12 days before symptom development or weight gain (McCaughan, 2009). Chest fluid bioimpedance technology measures the time required for a small electrical current to travel between two electrodes placed on the patient’s chest. These electrodes are attached to a small portable monitor and works on the principle that fluid decreases electrical resistance, or impedance, and dry environments increase resistance. Consequently, increased chest cavity fluid produces less electrical resistance and a lower reading on the bioimpedance monitor and less chest cavity fluid increases resistance and a higher reading. So, when the HF patient’s chest fluid begins to increase, the bioimpedance reading declines before the patient experiences any symptoms of exacerbation. The normal range for an adult is from 19 to 30 ohms (Peacock et al., 2000; Rosenberg & Yancy, 2000).

The team also realized the possibility of staff becoming overwhelmed because of the volume of new knowledge to be mastered. As a result, a decision was made to implement the chronic disease management program first, followed by the TM program approximately 2 months later. In retrospect, this decision was a sound one. It afforded staff the opportunity to fully update their knowledge on current best practices in treatment for HF while integrating disease management principles and practices into daily patient care routines. This preceded adding new knowledge and skills necessary to effectively operate and manage the TM equipment and program.

As a part of the team’s fiduciary responsibility to the healthcare system, extensive evaluation of

<table>
<thead>
<tr>
<th>Table 4. Content Outline of 46-page HF Patient Education Book</th>
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<tbody>
<tr>
<td>■ Overview of Heart Failure</td>
</tr>
<tr>
<td>■ Weigh Every Day</td>
</tr>
<tr>
<td>■ Managing Diet and Fluid</td>
</tr>
<tr>
<td>• Introduction to Low-Sodium/Salt Diet</td>
</tr>
<tr>
<td>• Foods to Eat/Foods to Avoid</td>
</tr>
<tr>
<td>• Eating Out</td>
</tr>
<tr>
<td>• Fluids to Drink/Fluids to Avoid</td>
</tr>
<tr>
<td>■ Medications</td>
</tr>
<tr>
<td>• Medication Safety</td>
</tr>
<tr>
<td>• Know Your Medications (patient is provided medication information for only his/her medications)</td>
</tr>
<tr>
<td>■ Resources for Patients</td>
</tr>
<tr>
<td>• Useful Web sites (Sidebar 5)</td>
</tr>
<tr>
<td>• Daily Weight Log</td>
</tr>
<tr>
<td>• Zones for HF Management</td>
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</tbody>
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<tr>
<th>Table 5. Patient Selection Criteria</th>
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<tr>
<td>■ New HF diagnosis</td>
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<tr>
<td>■ Exacerbation of HF</td>
</tr>
<tr>
<td>■ History of HF with hospital admission in the past 6 months for respiratory problems</td>
</tr>
<tr>
<td>■ Status post coronary artery bypass graft</td>
</tr>
<tr>
<td>■ Treatment for pneumonia, shortness of breath, and myocardial infarction within the past 6 months (indicates need for additional patient assessment).</td>
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<tr>
<th>Table 6. Staff Education Topics</th>
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<tbody>
<tr>
<td>■ HF disease process</td>
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<tr>
<td>■ Common drugs used for treatment</td>
</tr>
<tr>
<td>■ Pharmacist involvement for medication questions</td>
</tr>
<tr>
<td>■ Evidence-based best practices</td>
</tr>
<tr>
<td>■ Principles of chronic disease management</td>
</tr>
<tr>
<td>■ Use of teach-back methods to assess for patient knowledge retention</td>
</tr>
<tr>
<td>■ Key words and steps to assess patient willingness to stop smoking (if applicable)</td>
</tr>
<tr>
<td>■ Coaching and counseling of patients and caregivers on how to take control of and better manage their disease</td>
</tr>
<tr>
<td>■ Zones for HF Management (MedQIC, Home Health, n.d.)</td>
</tr>
<tr>
<td>■ Telemonitoring program integration</td>
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</tbody>
</table>
the cost of the TM program was undertaken with the assistance of the Agency Director of Business Operations. No reimbursement was readily available from third-party payers and a decision was made not to seek funding from grants. The team was also unable to identify potential cost savings reported by other agencies from reduced visit utilization. The agency’s average visit utilization rate was already low at 11 visits per episodes for all episodes and 17 for HF patients. According to an analysis of 2006 Medicare claims data, average visits per episode for the State of Georgia was 16.82 (Heydt, 2009). Because the Agency’s overall visit utilization was much lower than the State average, the team decided cost savings could not be achieved by decreasing visits to the HF patient. Instead, they identified projected savings by improving patient outcomes and thus positioning the agency for potential additional reimbursement under Pay-for-Performance. Because the hospital’s average loss per HF readmission was approximately $4,000, the team projected a significant savings to the healthcare system by reducing the number of readmissions. Additional revenues were also projected from increased referrals to the new HF-specific home health service line. Marketing efforts were developed and implemented to assure referral sources and the public was aware of the new program.

One of the greatest disappointments came when the team attempted to develop a standardized diuretic protocol to allow for administration of additional doses of oral diuretics and/or potassium and magnesium with weight gain and/or drop in chest fluid bioimpedance measurements. Several versions were written with the assistance of the MD. At the MD’s suggestion, each version was presented to the nursing staff along with a patient scenario requiring interpretation for appropriate medication administration using the proposed protocol. After several attempts, the team concluded that a safe protocol could not be developed because of the many variables involved. Order sets or protocols should not be written with multiple variables or in such a manner as to shift the responsibility from the prescribing physician to the nurse (Institute for Safe Medication Practices, 2010). Instead, the team elected to request individualized diuretic orders from physicians following a thorough admission medication assessment.

<table>
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<tr>
<th>Table 7. Discipline Referral Triggers Specific to HF</th>
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<tr>
<td><strong>Physical therapy</strong></td>
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<tr>
<td>• Increase in strength and/or endurance</td>
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<tr>
<td>• Lifestyle changes or modification</td>
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<tr>
<td><strong>Occupational therapy</strong></td>
</tr>
<tr>
<td>• Energy conservation assessment and training</td>
</tr>
<tr>
<td>• Cognitive/memory issues (at ARHH, the OT is trained in this area)</td>
</tr>
<tr>
<td><strong>Speech therapy</strong></td>
</tr>
<tr>
<td>• Cognitive/memory issues</td>
</tr>
<tr>
<td><strong>HHA</strong></td>
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<tr>
<td>• Short-term assistance with bathing for decompensated disease state or energy conservation needs</td>
</tr>
<tr>
<td><strong>Social services</strong></td>
</tr>
<tr>
<td>• Financial issues affecting compliance with care plan</td>
</tr>
<tr>
<td>• End-of-life planning</td>
</tr>
<tr>
<td>• Additional community resources</td>
</tr>
<tr>
<td><strong>Palliative care nurse</strong></td>
</tr>
<tr>
<td>• Repeated hospital readmits for HF</td>
</tr>
<tr>
<td>• Assessment of readiness for hospice referral</td>
</tr>
<tr>
<td>• End-of-life planning</td>
</tr>
<tr>
<td><strong>Dietitian</strong></td>
</tr>
<tr>
<td>• Significant dietary compliance issues resulting from lack of knowledge</td>
</tr>
<tr>
<td>• Complex nutritional or dietary planning needs</td>
</tr>
<tr>
<td><strong>Pharmacist</strong></td>
</tr>
<tr>
<td>• Medication questions</td>
</tr>
<tr>
<td><strong>Skilled nurse (In the state of Georgia, physical therapists can admit to home care so when the patient is therapy-only, the therapist assesses for the following referral triggers below and obtains physician orders for skilled nurse intervention.)</strong></td>
</tr>
<tr>
<td>• Hospital readmit in last 6 months for HF</td>
</tr>
<tr>
<td>• In-depth education on medications, disease process, or compliance with disease management</td>
</tr>
<tr>
<td>• Dietary compliance issues</td>
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Before implementation, staff was provided with extensive education (Table 6). Data on current agency length of stay, readmission, and emergent care rates from the agency’s contracted benchmark service and Home Health Compare were shared with the staff. Guidance was provided on front-loading visits and the desired visit frequency and duration. More frequent visits of shorter duration are necessary due to the impact of fatigue, lack of concentration, and forgetfulness in this patient population (Good Heart Failure, 2008). Discipline referral triggers were established (Table 7) and best practices care plans (Sidebar 3) were created in the electronic documentation system for all disciplines. These care plans included key interventions for dietary and fluid restriction, activity and energy conservation, medication management, influenza and pneumococcal vaccine administration, and staff reminders for appropriate community referrals and follow-up after discharge.

The team elected not to pilot the program because time was of the essence to improve patient outcomes. Strategies were planned to help staff become early adopters of the technology. Following implementation, patient charts were reviewed for staff compliance with established care practices. Feedback was routinely provided individually and collectively to staff. Focus groups held with field staff were utilized to gain insight on the efficiency and effectiveness of processes and workflows. Providing routine feedback to staff regarding the impact on patient care, while allowing input into process design, proved valuable resulting in staff rapidly embracing the changes required. Outcome data on the three metrics of success were also provided routinely to staff and served to identify the need for additional opportunities for performance improvement. These important principles of continuous performance improvement were utilized many times as a means of educating staff, as well as demonstrating how individual compliance with best practices impacted overall patient outcomes.

A Nurse Manager (NM) was designated as the Telemonitoring Coordinator (TMC) to lead the integration of the TM program into the chronic disease management program. Time was allotted during the NM’s day to write policies and procedures, plan for equipment management, develop staff education programs, plan workflows, and assist with all facets of implementation. The healthcare system’s Infection Prevention Manager was consulted to assure that appropriate infection control practices were implemented into workflow design. Processes were implemented to identify appropriate candidates from the agency census. Candidates were brought to the attention of case managers for evaluation to obtain physician’s orders. The TMC assisted the nursing staff with individual equipment installations in the patient’s home. The decision was made for the nurses to complete the equipment installations so that patient questions and equipment problems could be addressed timely. The TMC also tracked equipment utilization to make sure surplus units were being utilized. She also assured that equipment cleaning, storage, and preventive maintenance procedures were followed. In retrospect, designating an individual to spearhead planning, implementation, and follow-through with TM activities was one of the best decisions Agency leadership made to assure success of the program.

### Sidebar 2. Useful Web Sites for the Home Care Agency

- **Smoking Cessation:**
  - American Cancer Society
- **Guidelines for diuretic administration in the outpatient setting:**
  - http://www.ahrq.gov/
  - http://www.acc.org/
- **St. Paul Cardiovascular Institute**
  - Patient Participatory Care (e.g., patient centered care): http://participatorymedicine.org/
  - http://www.ihi.org/IHI/
- **Transitional Care Guidelines:**
  - http://www.medqic.org
  - http://www.nhpf.org/
### Sidebar 3. Standardized HF Care Plan Utilizing Evidenced-Based Best Practices

**Goal:** Patient will adhere to medication regimen.
- Review discharge instructions, patient education materials, and discharge medication list received from hospital or physician’s office.
- Review patient’s medication knowledge and instruct on medications regarding administration, side effects, actions, adverse effects, and special precautions, if needed.
- Assess patient’s retention of knowledge of medications using “teach-back” principles (i.e., “What is the name of your water pill?, What are the side effects, etc.?”).
- Assess cognitive and memory status and make referral to OT/ST as appropriate.
- Consult pharmacist or physician regarding any medication questions or concerns.

**Goal:** Patient will be able to utilize the “Heart Failure Zones of Management” to appropriately access the healthcare system.
- Patient will identify goal (i.e., stay out of hospital, reduce symptoms, increase activity, etc.)
- Patient will be able to verbalize symptoms to report to the home care nurse and, after discharge from home care, to the physician.
- Make phone call each Friday to assess patient status and need for weekend follow-up via phone call and/or visit.
- Educate in disease process and progression of disease, using applicable sections of the HF patient education book.

**Goal:** Patient or caregiver will complete daily TM activities.
- Daily weight every a.m. after waking, toileting, and in bedclothes. Record weight on weight log and notify the home health office of more than 2 lb weight gain in 24 hours.
- Daily blood pressure reading every a.m. after measuring weight.
- Obtain chest fluid status reading—patient or caregiver to complete after waking, toileting, and before eating or drinking every day × 5 following admission to establish baseline, then weekly (enter number of times per week).
- Obtain chest fluid status reading as needed for increased shortness of breath, cough, swelling, or weight gain.

**Goal:** Patient will adhere to dietary and fluid restrictions.
- With patient’s permission, utilize pantry staples and refrigerated foods to teach patient good and bad food choices.
- Teach patient how to read food labels to determine sodium content.
- Provide patient with printed materials for good and bad food choices.
- Teach patient importance of not adding salt to foods during cooking or at the table.
- Instruct patient to limit fluids to no more than 64 oz in 24 hours (or enter other amount as ordered by physician).
- Assess patient’s knowledge retention regarding food and fluid restrictions by utilizing “teach-back” principles (i.e., “Show me the good foods in your pantry, etc.”).
- Consult dietitian for additional counseling regarding complex dietary regimen.

**Goal:** Patient will adhere to plan for activity level and utilize energy conservation techniques.
- Patient will perform the following activities and exercises (enter to exercises) and verbalize the signs and symptoms indicative of the need to decrease activity.
- Teach energy conservation measures and pacing of activities.
- Assess need for modification in environment or care routines and request referral to OT or PT.

**Goal:** Patient will verbalize wishes regarding smoking cessation/tobacco use and follow the plan established.
- For a current user willing to make a quit attempt the following steps will be taken:
  - Advise patient to quit now to protect health and prevent current symptoms experienced by the patient from worsening.
  - Establish a quit date.
  - Have patient tell family and friends about decision to quit and to request that all tobacco products be removed from the home.
  - Educate on withdrawal symptoms.
  - Give the following antismoking medications to assist with quitting (enter those ordered by physician).
  - Teach patient about the importance of abstinence regarding tobacco products.
  - Assess patient’s past quit experiences and identify challenges/triggers and develop a plan to handle.
  - If applicable, teach importance of abstaining from alcohol consumption.
  - If applicable, encourage other smokers in the household to also stop smoking in partnership with the patient.
  - Provide emotional support to encourage patient, when needed.
  - Provide and cover the following educational materials with the patient (enter specific documents).
  - Call patient 2 to 3 days following established quit date to assess for problems; offer problem-solving strategies and emotional support.
- For the current user who is unwilling to quit at this time, take the following steps:
  - Advise patient to quit now to protect health and...
Update of Program

A total of 105 patients have been enrolled in the program. An average daily census of 18 is the norm for the TM program. Before program implementation, the typical patient had three hospital readmissions and two or more ED visits for HF exacerbation each year. The patient had a lack of understanding of the importance of diet and fluid changes and appropriate strengthening exercises and energy conservation techniques. As a result, the patients were frequently very tired, lacked the motivation to perform many routine activities of daily living, and quickly became very discouraged due to poor quality of life. These patients had difficulty ambulating within their homes, and making trips to the physician's office was extremely taxing. In essence, they were passive recipients of care and treatment and did not know how or when to advocate for their care needs.

Mr. Smith—One Patient’s Story

Following the new program implementation, Mr. Smith, a noncompliant patient, became more compliant, only having two ED visits and no readmissions to acute care in the year following home care discharge. With the knowledge and skills gained, he made the connection between his behavior and negative consequences. By working with his nurse to establish his desired goal for outcomes of care, Mr. Smith was able to learn the knowledge and skills necessary to achieve that goal. Having the knowledge that a nurse was always monitoring his weight and chest fluid status readings, he had more incentive to follow his care plan. He learned how to identify the subtle physical signs indicating impending problems, match those symptoms with changes in daily weight and periodic chest fluid bioimpedance readings, and identify the causative behaviors. In addition, he was taught how to be an advocate for his needs with his nurse, therapists, caregivers, and later his physician after discharge from home care so medication or treatment changes could be implemented earlier. In short, Mr. Smith learned how to change his lifestyle and, in the process, gained the motivation necessary to follow his plan of care due to improved energy levels and
admitted to the program, a result of patient and referral source demands. Due to the complexities of managing hemodialysis patients, a decision was made not to admit these patients to the TM program. Staff and referral sources were reeducated regarding this decision as well as referral of hospice-appropriate patients to palliative care, when appropriate. Periodic brainstorming sessions with clinical staff provided feedback on improving workflow processes. One such change was made after a nurse suggested to package cables, phone cords, adapters, and tape in a separate container from the TM equipment used for home installation. As a result, unnecessary items were not taken into the home where they could become contaminated.

Summary

The 2-year history with the chronic disease management and TM programs at ARHH has demonstrated the benefits of what can be accomplished when data are used in decision making and key stakeholders across the continuum of care participate to design a comprehensive approach to a complex chronic disease such as HF. Patients, families, caregivers, and referral sources consistently report satisfaction with the program and with improved quality of life (Sidebar 4). Previously noncompliant patients are now more compliant because they have learned how to better manage their disease process. Clinical staff is more satisfied because they are able to make patient visits when the patient most needs a face-to-face encounter. Staff has key patient information in hand before arriving at the patient’s home, thus maximizing visit time. Referral sources recognize the difference the program has made with patient outcomes and routinely seek out our agency for their patients. The hard work, time, and effort involved in extensively redesigning care and service to such a complex group of patients has been extremely rewarding and a definite win—win outcome for patients, staff, the Agency, and the healthcare system.

Outcome data were continually monitored and tracked (Figures 1, 2, and 3), and successes were celebrated along the way. Other patient outcomes not targeted by program goals also improved beyond the initial expectation including improvement in dyspnea, ambulation, bathing, toileting, and episode confusion frequency. Routine reports were also provided to the state home health agency and healthcare system leadership, medical staff, the agency’s Professional Advisory Committee, and the Health System Board. Trends in the wrong direction prompted a drill down to the patient level to identify problems and intervene with timely corrective actions. For example, by initially monitoring the frequency of use of the new HF care plan, it was identified that some staff had not implemented all aspects of the disease management program. Individual clinicians were reeducated, resulting in improved frequency of use of the care plan. In Quarter 3/2009, an increase in the hospital readmission rate led to the discovery that patients on hemodialysis as well as hospice-appropriate patients had been admitted to the program, a result of patient and referral source demands. Due to the complexities of managing hemodialysis patients, a decision was made not to admit these patients to the TM program. Staff and referral sources were reeducated regarding this decision as well as referral of hospice-appropriate patients to palliative care, when appropriate. Periodic brainstorming sessions with clinical staff provided feedback on improving workflow processes. One such change was made after a nurse suggested to package cables, phone cords, adapters, and tape in a separate container from the TM equipment used for home installation. As a result, unnecessary items were not taken into the home where they could become contaminated.

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Lessons Learned

Staff realized they would not be replaced by technology nor would the technology add more work to their busy schedules. With experience, the nurses began to trust chest fluid bioimpedance measurements as a predictor of weight gain. All patients were not appropriate for TM, either due to comorbidities or due to advance disease state. Also, implementing TM in the absence of patient or caregiver ability to fully participate in managing their disease had little positive impact on the patient’s outcome. However, when given the opportunity, knowledge, and tools to better manage their disease, many patients actually enjoyed participating in their care. This was possibly the most rewarding lesson learned.

![Figure 2. Acute care hospitalization rate demonstrating impact of HF disease management and TM programs on overall readmission rate.](image)

Note: No graph is included on the Emergent Care Rate, although it decreased 20% in the same time frame resulting in a 39% improvement in the agency’s national ranking. The dramatic increase in the overall readmission rate for YTD FY 7/10 is related to staffing issues in March and April.

![Figure 3. Thirty-day hospital readmit rate: HF exacerbation.](image)
Sidebar 4. Quotes from Staff, Patients, and Referral Sources Regarding ARHH HF Disease Management and TM Programs

Patients:
- “It taught me how to change my life, how to manage my diet, how to build myself up. Before, I could barely walk across the floor. Now I can walk to the doctor’s office. I played (guitar) all night at our little Christmas party and I wasn’t tired.”
- “It is comforting to know that someone is watching and to have someone to call when I have a question.”

Physicians:
- “We appreciate that you keep an eye on how our patients are doing.”
- “We like that you send us patient condition updates and not just their vital signs.”

ED:
- “We have noticed a decline in the numbers of HF patients from your agency who come in for treatment. And those patients who do return to the ED are less sick than HF patients of other home care agencies.”

Sidebar 5. Useful Web Sites for the Patient

- Basic information:
  - http://www.chfpatients.com
  - http://www.hfsa.org
  - http://www.megaheart.com
  - http://www.americanheart.org
  - http://www.abouthf.org
  - http://www.heartfailure.org
  - http://www.heartfailurematters.org
- Diet information and recipes Web site:
  - http://www.lowsodiumcooking.com
  - http://www.lowsaltfoods.com
  - http://www.recipezaar.com
  - http://www.dcdistributors.com (Web site for Chef’s Seasoning)
- Medication Web site:
  - http://www.mypillbox.org
- Scales Web site:
  - http://www.oldwillknottscales.com

Next Steps

The Agency has expanded the chronic disease management program and evidence-based best practices to patients with chronic obstructive pulmonary disease (COPD) and diabetes mellitus (DM). COPD exacerbations and diabetic-related hypoglycemic episodes are the agency’s second and third highest reasons for hospital readmissions, after HF. TM was not implemented as a part of the COPD disease management program because the readmission rates decreased with the implementation of evidence-based care. However, TM is planned for DM patients who are discharged from the hospital with a new or changed insulin prescription. A grant application has been made to a local foundation for purchase of TM equipment for patients with diabetes.

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FDA Approves First Oral Drug to Reduce MS Relapses

The U.S. Food and Drug Administration has approved Gilenya capsules (fingolimod) to reduce relapses and delay disability progression in patients with relapsing forms of multiple sclerosis (MS). Gilenya is the first in a new class of drugs that block some blood cells in lymph nodes, reducing their migration to the brain and spinal cord, which may help with reducing the severity of MS.

MS is a chronic, often disabling, disease that affects the central nervous system—the brain, spinal cord, and optic nerves. According to the National Multiple Sclerosis Society, there are about 400,000 people in the United States and 2.1 million people worldwide with MS. The progress, severity, and specific symptoms of MS are unpredictable and vary from one person to another. Symptoms can be mild, such as numbness in the limbs, or severe, such as paralysis or loss of vision.

Patients using Gilenya should be monitored for a decrease in heart rate upon starting the drug. Gilenya may also increase the risk of infections. Cases of serious eye problems (macular edema) have occurred in patients taking the drug and an ophthalmologic evaluation is recommended. The most frequent adverse reactions reported by patients taking Gilenya in clinical trials include headache, influenza, diarrhea, back pain, elevation of certain liver enzymes and cough.

The drug will be available in 0.5 milligram capsules. Gilenya is made by Novartis, Basel, Switzerland.

Source: FDA Press Release. Available at: http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm228755.htm

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