

# Remote Patient Monitoring Abstracts



## Remote Patient Monitoring *Diffusion Grants Program*

June 16, 2010



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## Introduction

The purpose of the Remote Patient Monitoring Diffusion Grants Program is to encourage the broader adoption of technologies that:

- Reduce the use of emergency department and hospital services by older adults (60+ years old).
- Enable independent living and the ability to live in the setting of one's choice.
- Lead to improvements in the cost and quality of care.
- Reduce the need for older adults to move to more intensive, higher-cost care settings.
- Reduce the burden on formal and informal caregivers.
- Work in the home, as well as long-term and post-acute care settings.
- Include monitoring devices for chronic conditions, post-acute care, and patient safety monitoring for wandering and falls.

Five grants focusing on diffusion of remote patient monitoring interventions that improve chronic disease management, post-acute care, and safety of older adults were approved by The SCAN Foundation Board of Directors on June 16, 2010. The five 1-year grants, totaling \$500,000, commenced operation on July 1, 2010.

The Request for Proposals for the initial round of Center grants was distributed to 2000+ individuals. A total of 63 Letters of Intent were received on March 12, 2010, 18 of which were invited to submit full proposals. The Center for Technology and Aging Grant Review Committee identified the five highest rated organizations to receive grant funds, which include:

- AltaMed Health Services Corporation and Stamford Hospital
- California Association for Health Services at Home (CAHSAH) Foundation
- Centura Health at Home
- New England Healthcare Institute
- Sharp Healthcare Foundation

This report contains detailed description of each project, their technologies, and their goals.

<b>Lead Organization</b>	<b>AltaMed Health Services and Stamford Hospital</b>
<b>Project Title</b>	The Remote Patient Monitoring Project – California and Connecticut
<b>Project Summary</b>	Implement an evidence-based model of RPM for older adults across different systems of care including a community clinic model of care and Program of All-Inclusive Care for the Elderly (PACE) setting (AltaMed) as well as expand the initial site of the model (Stamford). The project will also establish and expand a new healthcare para-professional “Telehealth Technician” training program.
<b>Technology</b>	Honeywell HomMed
<b>Targeted Locations</b>	East Los Angeles/Boyle Heights, California; Stamford, Connecticut
<b>Collaborators</b>	<ul style="list-style-type: none"> <li>• Sacred Heart University</li> <li>• Norwalk Community College</li> <li>• Charter Oaks Communities</li> </ul>
<b>12-Month Goals</b>	<ul style="list-style-type: none"> <li>• Promote and increase self-management habits, healthy behaviors, and improve health outcomes among seniors diagnosed with at least one chronic condition.</li> <li>• Enable independent living and the ability of older adults to age-in-place by reducing the incidence of older adults moving to more intensive, high-cost care settings and/ or use of emergency departments, or hospital services.</li> </ul>
<b>Policy Goals</b>	<ul style="list-style-type: none"> <li>• Develop Medicare funding of RPM technology</li> <li>• Promote the expansion of a “Telehealth Technician” training program in CA and on a national level.</li> </ul>
<b>Older Adult Population</b>	1 <sup>st</sup> year: 150 (75 CT, 75 CA from PACE and a Federally Qualified Health Center (FQHC) community clinic) low income older adults with congestive heart failure, COPD, diabetes, or hypertension. 5 <sup>th</sup> year: 1000’s of older adults
<b>Setting/Provider Type</b>	PACE program, community clinic, and senior housing facilities.
<b>Measurable Outcomes</b>	Measurable outcomes include: (1) 75% of participants will report improved self-management habits/ preventive care behaviors; (2) 75% will report a sense of satisfaction, confidence, and control around ability to self-manage condition; (3) 75% will present improved health readings; (4) Reduction of long-term care institutionalizations or reduced intentions to institutionalize/ reduced sense of need for long-term care institutionalizations by at least 10% in comparison to local averages; (5) Reduction by at least 2% of average hospital bed days, ED visits, or hospital admissions in comparison to local averages.
<b>Replication, Dissemination plan</b>	Plans are underway to expand the program to a third site in Pontiac, MI. Capable of expanding to other PACE, community clinic programs, and senior housing facilities.
<b>Sustainability plan</b>	Initial continued program support from a growing interest of funders including the California Endowment and the US Department of Commerce as well as other potential funding sources.
<b>Funding Request</b>	\$100,000
<b>Matching Funds</b>	\$655,330

### AltaMed/Stamford Technology Intervention

The technology intervention will be delivered to 150 patients; 75 patients in Stamford, Connecticut in their home setting with telehealth technician oversight, and 75 patients East Los Angeles/Boyle Heights, California with telehealth technician oversight. The telehealth technician model is currently in use at Stamford and will expand within Stamford and to the AltaMed site in CA.

The Honeywell HomMed Genesis DM Remote Patient Care Monitor and peripheral devices measures blood pressure, pulse, weight, and oxygen saturation levels. After each reading is obtained, data is automatically transmitted to an encrypted server via telephone link or broadband and monitored daily by a member of the participant's health care team. Data falling outside the normally accepted ranges will trigger intervention by a registered nurse or other appropriate care provider.



<b>Lead Organization</b>	<b>California Association of Health Services at Home (CAHSAH) Foundation</b>
<b>Project Title</b>	Evaluating the Effectiveness of RPM Technologies in Medi-Cal Waiver Programs
<b>Project Summary</b>	Use of the Intel Health Guide to monitor patients with chronic disease conditions and/or post-acute care for Medi-Cal's adoption of RPM technologies.
<b>Technology</b>	Intel Health Guide PHS6000
<b>Targeted Locations</b>	Northern, Central, and Southern California
<b>Collaborators</b>	<ul style="list-style-type: none"> <li>• California Department of Health Care Services, Long-Term Care Division</li> <li>• Accredited Home Health Services, Woodland Hills</li> <li>• Oxford HealthCare, Long Beach</li> <li>• Home Health Care Management, Inc., Chico</li> <li>• Maxim Healthcare Services</li> <li>• Spirit Home Health Care</li> <li>• Alternative Home Care</li> </ul>
<b>12-Month Goals</b>	<ul style="list-style-type: none"> <li>• Reduce the number of avoidable 30 day readmissions, hospitalizations, and ED visits.</li> <li>• Increase usability and acceptability of RPM system among patients, informal and formal caregivers.</li> <li>• Improve patient functional status, quality of life, quality of care, and patient and caregiver attitudes, behaviors, and compliance.</li> </ul>
<b>Policy Goal</b>	<ul style="list-style-type: none"> <li>• Make technologies available and reimbursable in all Medi-Cal Programs.</li> </ul>
<b>Older Adult Population</b>	1 <sup>st</sup> year: 100 40+ older adults with CHF at up to six sites. 5 <sup>th</sup> year: Technology available and reimbursable in all Medi-Cal program potentially reaching 60,000 older adults.
<b>Setting/Provider Type</b>	Home care service programs that are administered, monitored, and/or overseen by the CA DHCS, LTC division.
<b>Measurable Outcomes</b>	Measured at baseline and throughout six month intervention in a randomized control trial: Number of acute-care hospital admissions/ readmissions, days in hospital, 30 day readmission rates, number of long-term care/rehabilitation admissions/readmissions, number of ED visits, number of hours of LVN home-healthcare, home-healthcare costs, total healthcare costs, mortality, usability and acceptability of RPM system, functional status, quality of life, quality of care, clinical indicators, patient behaviors, and caregiver burden. Data will be collected from OASIS-C, patient and caregiver surveys.
<b>Replication, Dissemination plan</b>	Broadly expandable to other payment sources such as, other state Medicaid programs, the Medicare program, private insurers, and managed care plans.
<b>Sustainability plan</b>	CAHSAH believes the findings from this project will demonstrate positive outcomes and result in diffusion to the broader Medi-Cal program.
<b>Funding Request</b>	\$100,000
<b>Matching Funds</b>	\$140,322

### CAHSAH Technology Intervention

The Intel Health Guide PHS6000 is a comprehensive solution, combining an in-home patient device with an online interface allowing clinicians to monitor patients and remotely manage care. The solution offers interactive tools for personalized care management and integrates vital sign collection, patient reminders, multimedia educational content and feedback and communications tools such as video conferencing and e-mail. The Health Guide can connect to specific models of wired and wireless medical devices, including blood pressure monitors, glucose meters, pulse oximeters, peak flow meters and weight scales. The Health Guide stores and displays the collected information on a touch screen and sends to a secure host server, where health care professionals can review the information. Patients using the Health Guide can monitor their health status, communicate with care teams and learn about their medical conditions.

LVNs will monitor data daily from the Health Guide to identify potential problems and to report to other clinicians when appropriate over a six month time period. All sites have experience with similar RPM devices.



<b>Lead Organization</b>	<b>Centura Health at Home (CHAH)</b>
<b>Project Title</b>	Enhancing the Home Telehealth Program with Call Center Activities
<b>Project Summary</b>	Augment the current telehealth continuum at Centura Health at Home by merging 24/7/365 call center activities with telehealth. Also broaden telehealth program from home-care eligible patients to other services.
<b>Technology</b>	24/7/365 clinical call center linked with telehealth monitors (inLife by American Telecare) and video conferencing system (American Telecare Lifeview)
<b>Targeted Locations</b>	Denver, Colorado
<b>Collaborators</b>	<ul style="list-style-type: none"> <li>Internal collaboration with iPN, an internal physicians group at Centura</li> </ul>
<b>12-Month Goals</b>	<ul style="list-style-type: none"> <li>Decrease the rate of recidivism of 30 day readmissions by 2% at two hospitals at Centura Health – St. Anthony's Central and Porter Adventist Hospital.</li> <li>Increase the quality of life for patients as measured through the Quality of Life Survey SF-36</li> <li>Increase the numbers of patients served in the telehealth program by a minimum of 200 per year</li> </ul>
<b>Policy Goal</b>	<ul style="list-style-type: none"> <li>In 2006, Centura established a line item Medicaid reimbursement for telehealth through the state. The project staff will inform CA organizations on how to approach the state and the steps taken to gain reimbursement for telehealth.</li> </ul>
<b>Older Adult Population</b>	1 <sup>st</sup> year: 180 CHAH patients in Denver, CO with Diabetes, COPD, or CHF. 5 <sup>th</sup> year: 3000 older adults
<b>Setting/Provider Type</b>	Senior living communities
<b>Measurable Outcomes</b>	Medical Service use (e.g., Hospital admissions/readmissions, days in hospital, ED visits); costs of medical care and extrapolation of savings to the system via reduced readmission rates; clinical measures (e.g., falls, blood pressure, confusion, etc) and quality of life defined by the kind of chronic conditions; and patient behaviors (e.g., medication adherence, patient safety, self-monitoring) having to do with self-care.
<b>Replication, Dissemination plan</b>	As part of Centura Health, the largest health care system in the state of Colorado, CHAH is well positioned to expand technology use to Centura Health's sponsors: Catholic Health Initiatives and Adventist Health Services; the seven senior living communities at CHAH, which have over 10,000 older adult members; the Colorado Center for Nursing Excellence; Colorado Health Outcomes / University of Colorado; the Health Passport Program, which has 10,000 older adult members; and the Integrated Physician Network (iPN), which in turn is heavily linked to the Patient Centered Medical Home (PCMH).
<b>Sustainability plan</b>	Sustainability is addressed via projected outcomes in that, if project goals are achieved, the financial impact combined with new regulations on re-hospitalization will allow for continued use of this program and adoption to other communities.
<b>Funding Request</b>	\$100,000
<b>Matching Funds</b>	\$88,100



### CHAH Technology Intervention

The proposed project – which blends telehealth and call center technologies – benefits older adult health while making more effective use of existing health care resources and extending the reach of a limited nursing staff. A homecare nurse can see only five to seven patients a day; whereas a telehealth nurse can see 15 to 20 patients a day. In addition, the utilization of the existing call center in augmenting telehealth extends the continuity of care so that patients have access 24 hours a day, seven days a week. There is currently an active nurse call center that has been in existence for 20 years utilizing a business marketing model. This project will modify the call center's approach so that it utilizes a clinical business model that will, in turn, support a more robust telehealth program. There will be 14 total telehealth call center technicians who can actively and adequately assist with telehealth monitoring and clinical questions. Currently, patients in CHAH telehealth program are stratified into two categories:

1. Those at highest risk who receive video monitoring. Here, the home telehealth video / call center monitoring program features a nurse stationed in an office with a server and monitor that allows for real time connection to a patient – no matter where the patient is located (model is by American Telecare and is called LifeView). Through the camera on the monitor, the nurse and patient can see each other and communicate. The nurse guides the patient through the data collection process for vital signs while watching the patient for accuracy of technique (NASA technology is used in the stethoscope allowing the nurse to accurately hear heart and lung sounds). The data is then immediately transmitted to the nurse's monitor allowing the nurse to assess the patient's clinical condition. Based on these results, the nurse decides what interventions are needed.

LifeView (retails for \$4,500): ATI's LifeView™ station features live audio and video interaction as well as remote client monitoring. The interactive audio and video client station features a telephonic stethoscope combined with other medical peripherals (blood pressure, pulse oximeter, scale) to allow nurses to conduct "real-time visits" to clients. The nurse and client can see and talk to each other while the nurse obtains both objective and subjective information, allowing a timely clinical assessment of client status. Remote client monitoring allows nurses to monitor a client's condition independent of a face-to-face connection. Clients take vital signs and answer questions related to their current health status. Results of a remote monitor session alerts nurses to health changes, which allows for early intervention and education.

2. A second tier of patients receive assistance via an electronic home monitor and when connectivity is established, daily physical peripherals (vitals signs, weight) are downloaded for review by RNs who determine interventions, if needed. This monitor is smaller than a bread box and readily clips into the phone line to upload patient stats (American Telecare model inLife). This element also features voice-activated questions to which the patient responds via a touch screen.

inLife (retails for \$1,500): The American TeleCare multi-user inLife™XP technology assists clinicians at Good Samaritan Society facilities in the early identification of potential medical issues. By understanding how well clients are controlling their chronic condition, clinicians can modify the care plan and re-stabilize a client as needed. Clients become proactive in their healthcare thru their interactions with the inLife™XP and their health care team. The multi-user inLife™XP telehealth technology lowers the cost for remote client monitoring within a group living facility. Each inLife™XP unit can accommodate up to 25 clients when used with the multi-user feature.



<b>Lead Organization</b>	<b>New England Healthcare Institute</b>
<b>Project Title</b>	Home Telehealth (HT) Rapid Demonstration Project
<b>Project Summary</b>	To promote the broader adoption of home telehealth technology by enhancing the evidence of its clinical and cost effectiveness in the treatment of patients suffering from congestive heart failure and by driving policy change in Massachusetts and nationally.
<b>Technology</b>	Electronic House Call System
<b>Targeted Locations</b>	Eastern Massachusetts
<b>Collaborators</b>	Massachusetts Technology Collaborative, Atrius Health, and Blue Cross Blue Shield Massachusetts
<b>12-Month Goals</b>	<ul style="list-style-type: none"> <li>• Demonstrate clinical and financial benefits for the use of RPM technologies, specifically by reducing hospital readmissions</li> <li>• Create sustainable and replicable models of clinical practice and payment mechanisms for future expansion of RPM technology</li> </ul>
<b>Policy Goal</b>	<ul style="list-style-type: none"> <li>• Drive policy change to expand the use of RPM technology and associated clinical practice improvements in Massachusetts and nationally by developing actionable policy strategies, writing policy briefs to public and private policymakers, and working with BCBSMA to change reimbursement of RPM technologies.</li> </ul>
<b>Older Adult Population</b>	1 <sup>st</sup> year: 180 patients recently hospitalized for congestive heart failure 5 <sup>th</sup> year: 2,500 CHF patients in Atrius Health
<b>Setting/Provider Type</b>	Integrated Delivery System
<b>Evaluation and Measurable Outcomes</b>	The project will be conducted as a case matched study comparing the Home Telehealth intervention to usual care. Primary outcome measures will focus on health care service utilization (number of hospitalizations, ED visits, ambulatory visits, phone encounters, SNF visits, home care visits, medication possession ratio) and total cost of care (patient out-of-pocket expenditures as well), while patient, caregiver and provider qualitative measures will be captured through multiple survey instruments. A robust return-on-investment analysis will also be conducted. Preliminary findings will result in a report 6 months into the project, with full data collection and completion of the ROI analysis.
<b>Replication, Dissemination plan</b>	The project will focus on identifying and addressing the existing barriers to use of HT and will work with a multi-stakeholder Advisory Group to develop and disseminate policy recommendations to enable broader adoption of the technology.
<b>Sustainability plan</b>	The project partners will aid in the identification of effective clinical and financial models for the long-term use of HT beyond this project. With the successful demonstration, Atrius Health will expand the use of the technology to their entire CHF population and diabetic population.
<b>Funding Request</b>	\$100,000
<b>Matching Funds</b>	\$662,000

### New England Healthcare Institute Technology Intervention

The proposed program targets patients who were discharged from the hospital with a primary diagnosis of congestive heart failure (CHF) within approximately 60 days prior to enrollment and includes a control group and a study group of Chronic Heart Failure (CHF) patients. All patients will continue their routine medical care for CHF at Atrius, per current medical guidelines. In addition, the study group will participate in the proposed RPM intervention.

Each patient on the study program will receive the electronic house call system (EHCS) equipped with digital scale, an automatic blood pressure cuff, and a pulse oximeter. This device will be used to transmit the patient's daily weight, blood pressure, heart rate and information on key cardiac symptoms (e.g., increase in shortness of breath, edema, chest pain, and palpitations) to a secure Telemonitoring web portal through the telephone line or broadband. EHCS will be programmed to ask specific questions related to medication use on a daily basis and the patient's input will then be sent to the web portal. Once the web portal receives the daily data input, an automated computer algorithm will check the patient's data with acceptable ranges/ answers previously set by the patient's telehealth care provider to identify potential problems that could indicate an impending hospitalization or need for physician-directed intervention. The computer will then generate a report of this as an alert-notification ("Red Flag") to the designated nurse/ case manager when he/she logs in to the remote web portal. Case managers monitor the system on a daily basis and will confirm the reported data by calling the patient. Once confirmed, a report will be generated to clinicians who will intervene telephonically or through video in the EHCS to further evaluate the patient, and recommend an appropriate treatment plan.



<b>Lead Organization</b>	<b>Sharp HealthCare Foundation</b>
<b>Project Title</b>	Expanding the use of remote patient monitoring to patients with multiple chronic conditions
<b>Project Summary</b>	To reduce readmissions by utilizing remote patient monitoring technologies on a wider patient population (those with multiple chronic conditions).
<b>Technology</b>	Remote Patient Monitoring Technologies
<b>Targeted Locations</b>	San Diego, CA
<b>Collaborators</b>	<ul style="list-style-type: none"> <li>No formal collaborations outside Sharp in this project.</li> </ul>
<b>12-Month Goals</b>	<ul style="list-style-type: none"> <li>Reduce 30 day unplanned readmit rates by 30% during the grant term among senior patients.</li> <li>Reduce direct costs associated with readmissions by 30% among senior patients, clinically related acute care readmits.</li> <li>Improve coordination of care between hospital and physician office (the primary opportunity for preventing unnecessary hospital admissions).</li> <li>Improve the quality of life for patients managing multiple co-morbidities by keeping them well managed in the home setting.</li> <li>Increase hospital and emergency room capacity for the community by providing effective care for chronic care patients in the community care model.</li> </ul>
<b>Older Adult Population</b>	<p>1<sup>st</sup> year: 80-120 patients in Sharp's senior population (65+) with multiple co-morbidities (HF, COPD, PAD, ASHD, hypertension, diabetes, and chronic kidney disease)</p> <p>5<sup>th</sup> year: 500 - 600 patients</p>
<b>Setting/Provider Type</b>	Patient homes and Sharp HealthCare clinicians
<b>Measurable Outcomes</b>	Medical service use (e.g. Total admissions, readmissions); cost of medical care (hospital costs, medical group costs, system costs); caregiver burden; clinical measures; patient behaviors (e.g. Compliance using remote monitoring technologies; medication adherence, primary/specialty physician follow up, drugs), and mortality.
<b>Replication, Dissemination plan</b>	Knowledge management, specifically sharing best practices and lessons learned with other organizations, is a cultural norm at Sharp HealthCare. Additionally, the probable CMS reimbursement changes are an added incentive to invest in RPM.
<b>Sustainability plan</b>	Sharp has demonstrated reducing costs, admissions, and overall bed days utilizing RPM for CHF patients. The financial savings (cost avoidance) of the technology is significantly greater than the cost to implement and maintain the program. The proposed program will provide the opportunity to realize continued financial benefits by serving a broader population, and serve as a strategy in dealing with unplanned hospital readmissions.
<b>Funding Request</b>	\$100,000
<b>Matching Funds</b>	\$200,000