Center for Technology and Aging

Medication Optimization Diffusion Grants Program
Summary of Awarded Grants
January 2010

Program Descriptions

Lead Organization	**American Society of Consultant Pharmacists Foundation (ASCPF)**
Project Title	Medication Optimization using Monitor-Rx
Project Summary	Pharmacist utilization of a web-based clinical tool to optimize the medication regimens of older adults seen in three practice sites.
Technology	Monitor-Rx, a web-based medication assessment tool for use in geriatric patients.
Targeted Locations	Irvine, California and surrounding area.
Collaborators	• OASIS Older Adult Full Service Partnership (FSP) • University of California Irvine Senior Health Center • Alzheimer's Family Services Center • Interactive Aging Network (IAN)
12-Month Goals	• Increase awareness/knowledge among clinicians that medications may contribute to physical, functional or cognitive decline in older adults, which should lead to higher levels of referrals to pharmacists for medication review. • Reduce anticholinergic medication burden, which may improve physical/cognitive function. • Reduce the number of inappropriate and unnecessary drugs an individual is taking to reduce costs and avoid potential medication problems.
Older Adult Population	1st year: 150 older adults at three (3) sites. 5th year: Potential to apply intervention to 800 UC Irvine clients per year (4000 over 5 years). Broadly expandable nationwide.
Setting/Provider Type	Pharmacist evaluation and consult with older adults from a mental health services program, primary care geriatric practice, and Alzheimer's family service center.
Measurable Outcomes	Measured at baseline and throughout 2010: awareness/knowledge about selected medication risks, number of referrals to pharmacists for medication review, number of pharmacist recommendations and acceptance rate of recommendations, data about patients and use of selected medications. Barriers and successes will be documented.
Replication, Dissemination plan	ASCPF and the IAN have recently launched Monitor-Rx and are actively marketing and selling licenses to use the product.
Sustainability plan	ASCPF believes the findings from this project will demonstrate sufficient value in terms of medication optimization and improved outcomes to justify continued use of the technology beyond the grant period. Moreover, ASCPF is currently selling licenses for use of Monitor-Rx to community-based pharmacists. Contracts with other organizations (e.g., MTM service providers) are also in development. ASCPF is non-profit but plans to use revenue from Monitor-Rx to fund other initiatives.
Funding Request	$93,465
Matching Funds	$39,200

American Society of Consultant Pharmacists Foundation Technology Intervention

Monitor-Rx is a medication assessment tool designed for use in the geriatric population. The tool performs three primary functions:

- Correlation of medication effects with physical, functional, and cognitive changes;
- Identification of medications with anticholinergic effects and medications inappropriate for use in the elderly population; and
- Provision of medication monitoring recommendations (relevant indicators of adverse drug effects) for problems the medication regimen puts the patient at greatest risk for.

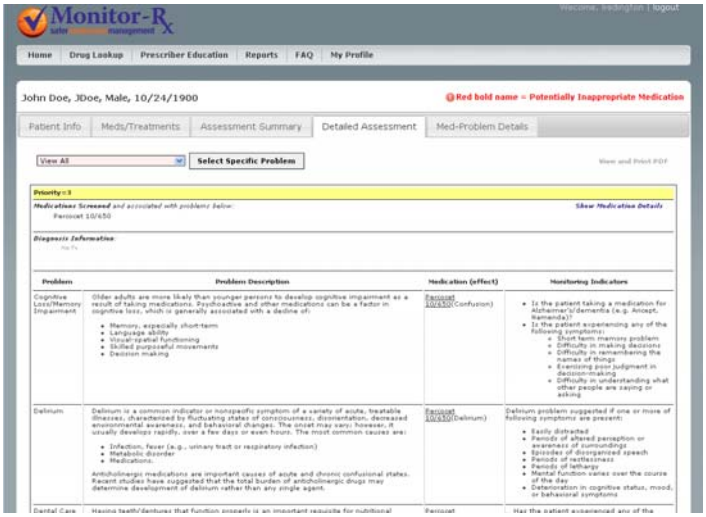
The Monitor-Rx system reviews an older adult's drug regimen to identify medications that have the potential to cause, aggravate, or contribute to a patient's physical, cognitive, or functional decline. Monitor-Rx improves the effectiveness of medication reviews in three ways:

- Assisting in the problem identification process when evaluating medication regimens of older adult adults to identify, resolve, and prevent medication-related problems.
- Facilitating incorporation of medication monitoring information into the patient's plan of care.
- Generating documentation to support recommendations for changes in medication therapy.

The Monitor-Rx system is delivered using a web-based Software as a Service (or SaaS) model, which means that the system is maintained centrally and clients do not have to administer any local equipment or software in order to benefit from it. Organization clients can manage their case data and medication profile information within the Monitor-Rx system, which conducts its analysis and returns results. ASCPF databases of problems and medications are validated and updated on a regular basis, and all changes are instantly available to clients. All key information is securely handled to ensure full compliance with all relevant Health Insurance Portability and Accountability Act (HIPAA) policies.

How Monitor-Rx Will Be Used in Project Sites

The pharmacist will routinely use Monitor-Rx to identify potential medication problems, inform recommendations for changes in therapy, document recommendations, update medication lists, provide medication list and medication monitoring recommendations to patients and caregivers, and provide Monitor-Rx reports to other clinicians when appropriate. At the OASIS site, Monitor-Rx will also be routinely used by case managers, nurses, and the nurse practitioner.



Lead Organization	**Caring Choices**
Project Title	Medication Dissemination Project Utilizing Philips Medication Dispenser (PMD) Technology
Project Summary	To improve medication adherence and monitoring by diffusing an existing technology-based medication management program to new senior service providers and new service areas in order to improve medication use by older adults in California.
Technology	Philips Medication Dispensing Service to improve medication management.
Targeted Locations	Rural and urban areas in Sacramento, Riverside, San Bernardino, and Los Angeles Counties.
Collaborators	• Home Health Care Management (HHCM) • Eskaton • Alternative Home Care • Asian Community Center • Visiting Nurse Association of the Inland Counties • Aging Services of California (ASC) • Philips Lifeline
12-Month Goals	• Successfully diffuse the medication management program utilizing PMD machines to four different provider types in four new geographic locations in California. • Program participants demonstrate at least a 95% medication compliance rate with the use of the PMD machine resulting in a reduction in hospitalizations and emergency room visits. • Informal caregivers of program participants report a decrease in caregiver burden within 4 months of placement of the PMD machine as demonstrated by use of Zarit Burden Interview. • Participants report an increased quality of life through the use of the PMD machine when compared to their reported quality of life prior to placement of the PMD.
Older Adult Population	1st year: 100 older adult clients of the four (4) collaborating senior service providers. 5th year: 4000 older adult clients of the four (4) collaborating senior service providers.
Setting/Provider Type	Multiple senior living and home health agency providers
Measurable Outcomes	Medication compliance, quality of life, caregiver burden, hospital and emergency department utilization
Replication, Dissemination plan	If successful, the project will demonstrate that HHCM's existing program can be successfully adapted and replicated in four diverse older adult care settings. Caring Choices will provide information to develop a tool kit to help others develop a turnkey PMD program. ASC and others have committed to disseminate project findings via policy advocacy initiatives, websites, publications, and conferences.
Sustainability plan	HHCM will train the four program partners to secure funding in order to sustain their programs beyond 12 months. HHCM has developed funding mechanisms (grants, 3rd party insurance payment) to sustain their program for the past 10 years.
Funding Request	$100,000
Matching Funds	$188,601

Caring Choices Technology Intervention

Home health or senior living agency staff will place the Philips Medication Dispensers (PMD) in the homes of each of the 100 participating older adults. The individual PMDs will be programmed via Internet to deliver medications on a pre-determined schedule. Either participants or caregivers will load the medications into the individual PMDs. The dispenser is pictured below.

Lead Organization	**Connecticut Pharmacists Foundation**
Project Title	Delivering Culturally Appropriate Care to Optimize Medication Use in the Elderly
Project Summary	This project will deliver culturally and linguistically appropriate Medication Therapy Management (MTM) services provided by pharmacists and community health workers (CHWs), trained to use telemedicine, to elderly Cambodians.
Technology	Video-conference, electronic health records, spoken-format technology.
Targeted Locations	Long Beach, California; Connecticut; and Western Massachusetts.
Collaborators	• Khmer Health Advocates • Mount Carmel Cambodian Project • University of Connecticut School of Pharmacy
12-Month Goals	• Improve patients' drug therapy outcomes >20% from baseline. • Demonstrate similar improvement of drug therapy outcomes between face-to-face and telemedicine-provided service. • Reduce potentially inappropriate medication use >20%. • Demonstrate a reduction in health expenditures compared to the cost of providing the service by a factor of least 8 to 1.
Older Adult Population	1st year: 100 (50 face-to-face, 50 videoconference linked) older Cambodian-American adults residing in CA, CT, and MA 5th year: Potential to apply intervention to 8% of 45,000 Cambodians in Long Beach, CT, and Western MA; and 8% of 300,000 Cambodian-Americans nationwide. (16% of Cambodian-Americans are over 62; as many as half have chronic illness and take 3 chronic medications.) The intervention can also be utilized to reach remote locations where minority populations have limited English-speaking abilities.
Setting/Provider Type	Pharmacists, community health workers, Cambodian-American health organization.
Measurable Outcomes	Analyses of pharmacist interventions will include patient and provider response to recommendations, clinical goals of therapy, and evidence-based documentation of cost savings.
Replication, Dissemination plan	Raise awareness and promote benefits of technology intervention via publications, presentations, and policy advocacy for federal and private reimbursement.
Sustainability plan	Grant funding and other potential funding sources.
Funding Request	$92,000
Matching Funds	$91,000

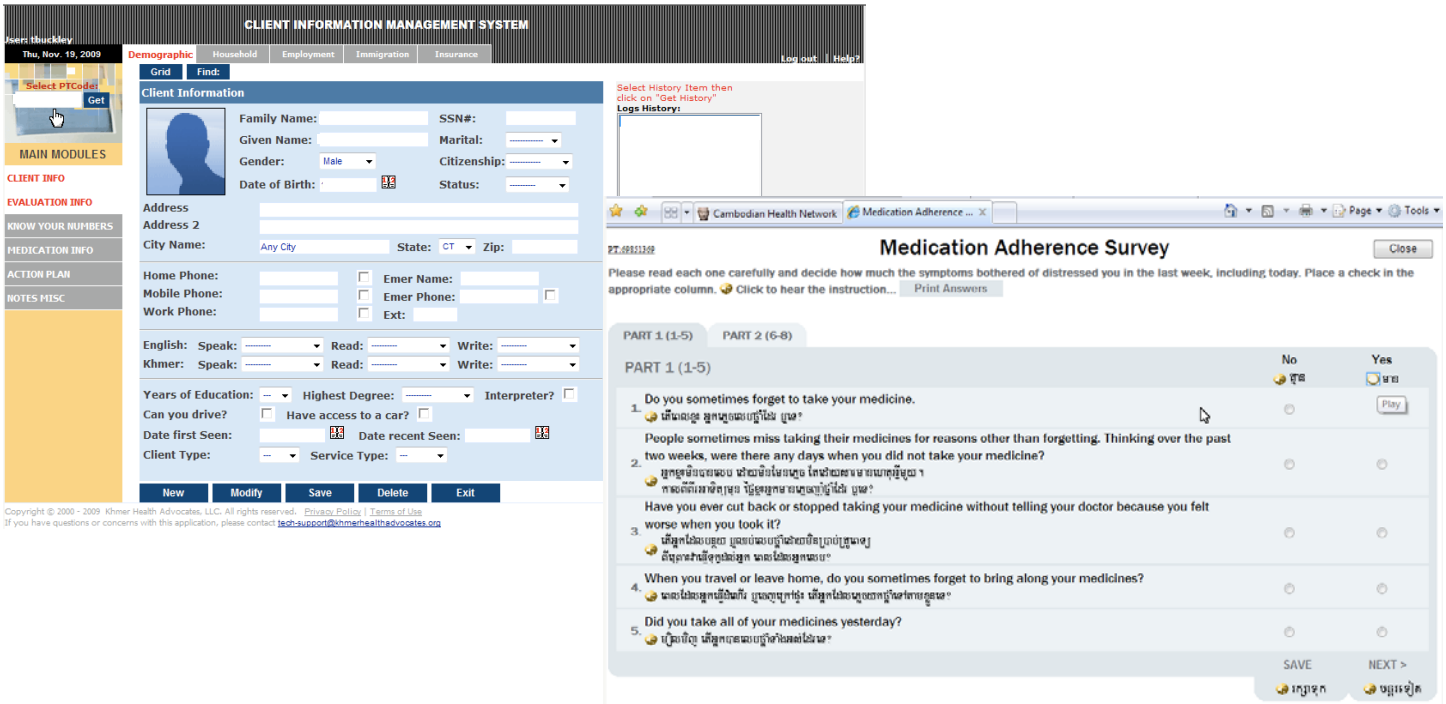
Connecticut Pharmacists Foundation Technology Intervention

The technology intervention will be delivered to 100 patients; 50 patients in Connecticut/Western Massachusetts in their home or clinic setting through face-to-face consultation with community health workers (CHWs) and pharmacists, and 50 patients in Long Beach, California in their home or clinic with local CHWs and pharmacists via telemedicine link. The telemedicine link is currently in use by Khmer Health Associates in numerous communities nationwide. Initial visits will produce a comprehensive medication record of prescription and non-prescription therapies, identification and potential resolution of drug-therapy problems (including medication adherence), a medication action plan for the patient and a Medication Therapy Management (MTM) report for the patient's provider. Follow-up visits will occur quarterly to monitor progress with the plan.

Khmer Health Associates' CIMS© software is a web-based electronic medical records and chronic disease management system that is accessible to health care providers and patients. In addition to health information documentation, it provides spoken format technology, allowing patients to respond to health survey questions and answers in their Khmer language. Examples of Khmer spoken tools include the Hopkins Systems Checklist, the Harvard Trauma Questionnaire, the Modified Morisky Medication Adherence Survey, and the Beliefs About Medicine Questionnaire. System data can be used by the patient for managing their health, by the program for quality control and allocation of resources, and by the provider for chronic disease management.

Additional technology to be utilized includes hardware and software-based videoconferencing and bridging which will allow pharmacists to communicate through high-definition video to community health workers and patients at remote locations, and patient care peripherals such as glucose meters attached to the videoconferencing system.

Medication Therapy Management documentation by pharmacists will occur utilizing the Assurance Pharmaceutical Care System©, a web-based system that documents patient medical conditions, medications, current status of each condition, drug therapy problems identified, and how they were resolved, and linking them to direct and evidence-based cost avoidance.



Lead Organization	**Veterans Administration Central California Health Care System (VACCHCS)**
Project Title	Effects of home self management and medication adherence evaluations by Telemedicine Interventions in Chronic Heart Failure (CHF).
Project Summary	To improve compliance to self care and persistence with medication regimens by diffusing telemedicine and medication adherence interventions (Health Buddy and Medication Possession Ratio (MPR) evaluations).
Technology	Health Buddy® and Medication Possession Ratio (MPR) evaluations
Targeted Locations	Large geographical area that includes five counties in Central CA that are designated as "Rural" and "Medically Underserved."
Collaborators	Intra-organizational VACCHCS collaboration.
12-Month Goals	• Improve access to cost-efficient quality healthcare delivery method using available Telemedicine technology. • Improve medication reconciliation and medication adherence. • Decrease inpatient admissions/ bed days used (acute/ semi acute/ nursing home) and mortality. • Improve patient satisfaction.
Older Adult Population	1st year: 200 (100 study, 100 control) older veterans with a diagnosis of CHF who had >1 hospital admission or ER visit in the previous 24 months. Patients will be identified from the VACCHCS Heart Failure Registry. 5th year: Potential to apply this "system re-design" to 2000 CHF patients at VACCHCS (1 out of 15 veterans at VACCHCS were diagnosed with heart failure in the past 2 years), plus thousands of veterans seen at the other VA medical centers.
Setting/Provider Type	Internal Medicine practice augmented by care coordination and telehealth services.
Measurable Outcomes	Number of hospitalizations, average inpatient bed days used, number of emergency room visits, number of deaths, compliance & adherence to medication, quality of life and satisfaction index (SF-36), and estimated cost of healthcare.
Replication, Dissemination plan	VA is the nation's largest integrated health care system that operates over 1,400 sites, including hospitals, clinics and nursing homes. Successful quality improvement projects are rapidly communicated and frequently shared between sites. Data from the proposed program will be analyzed and presented to local, regional, and national leaders in the VA system.
Sustainability plan	The physicians involved in this program plan to continue using these "best practices" beyond the 12-month grant period. This decision does not depend on continued grant funding.
Funding Request	$100,000
Matching Funds	$147,500

Veterans Administration Central California Health Care System Technology Intervention

The proposed program 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 VACCHCS, per current medical guidelines. In addition, the study group will participate in the proposed Telemedicine intervention.

Each patient on the study program will receive a home monitoring system equipped with digital scale, an automatic blood pressure cuff, and a Health Buddy® Appliance ("Health Buddy"). Health Buddy is a small electronic device connected to the home telephone line that can transmit clinical data based on patient input. 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. Health Buddy will be programmed to ask specific questions related to medication use on a daily basis (Did you take your heart medications today – YES/NO – Why not?) 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 the physician consultants who will intervene telephonically, use telemedicine technologies to further evaluate the patient, and recommend an appropriate treatment plan.

Additionally, a monthly Medication Possession Ratio will be generated by the VACCHCS Pharmacy Service to help telemedicine providers and case managers evaluate patients' medication use and compliance based on refill patterns.

The Health Buddy Appliance from Robert Bosch Healthcare is a telehealth solution that collects and transmits disease management information about a patient's chronic condition including vital signs, symptoms and behaviors. Patients can be prompted to answer questions and take required measurements with a variety of medical devices. The Health Buddy Appliance automatically dials a toll-free number to send the information to a secure data center.

Lead Organization	**Center for Home Care Policy and Research, Visiting Nurse Service of New York**
Project Title	IMPACT-CI: Improving Medication Management Practices and Care Transitions through Technology—Focus on the Cognitively Impaired
Project Summary	To address the challenge of optimizing medication management for a particularly vulnerable population – community dwelling, cognitively impaired (CI) older adults with chronic illness and complex medication regimens. The project will implement and evaluate a multi-faceted, information technology (IT) based intervention designed to better support nurses, as well as cognitively impaired patients and their caregivers, in the challenging process of managing multiple medications in the context of multiple co-morbidities.
Technology	IT-based medication complexity algorithm, electronic clinical alerts and decision support tool, and caregiver support materials for CI elders with complex medications regimens.
Targeted Locations	4 Boroughs of New York City (NYC): Bronx, Brooklyn, Manhattan and Queens
Collaborators	• The Agency for Health Care Research and Quality (AHRQ) funded development of technology. • Several VNSNY divisions will collaborate on this project.
12-Month Goals	• Extend an IT intervention to improve management for CI patients in home health care with complex medication regimens • Examine the effects of the intervention on medication management practices of intervention home health care nurses compared to usual care • Examine the effects of the intervention on patient outcomes and service use
Older Adult Population	1st year: 150 (75 intervention, 75 usual care) CI patients. 5th year: Potential to apply intervention to 1200 CI patients/year in the VNSNY NYC service area and to 20% of home care clients in a target group of 1700 home care agencies nationwide.
Setting/Provider Type	Home health care and community-based health services
Measurable Outcomes	Comparison of intervention versus usual care nurse activities related to medication reconciliation, regimen simplification, caregiver teaching. Patient level outcomes include change in Medication complexity risk score, caregiver knowledge of and confidence in ability to manage medications and patient use of emergent services due to medication related events.
Replication, Dissemination plan	VNSNY is well positioned to utilize several dissemination/marketing venues to expand technology use: 1) the national CHAMP program to advance excellence in home care for older people; 2) the national Home Health Quality Improvement Campaign, which has two main foci--improving medication management and avoiding unnecessary hospitalization; 3) AHRQ Innovations Exchange; and, 4) the National Association for Home Care.
Sustainability plan	If proven successful, the automated complexity algorithm and electronic decision support tool can be instantly distributed (at no additional cost) to all VNSNY tablet computers. The technology can become part of the home nurses' workflow. Other organizations will have free use of the algorithm, clinical alert content and tools.
Funding Request	$91,857
Matching Funds	$55,221

VNSNY Technology Intervention

All VNSNY professional nursing field staff in the post-acute division use pen-based Lenovo personal computers (the "tablet"), a mobile point of care platform that runs a secure electronic health record (EHR) called the Patient Care Record System (PCRS). Information on new referrals and continuing patients is regularly updated and wirelessly communicated between the tablet and VNSNY's mainframe. Three key modules in the PCRS inform nurses' clinical practice: 1) the Plan of Care, 2) the Visit Module, and 3) the Medications Module. Before and/or during each patient visit, nurses review and update the patient's medications and Plan of Care and document the patient's progress in a specific "Care Plan Problem" in the Visit Module.

The IT intervention, along with the proposed expansion to include the cognitively impaired (CI) population, uses these existing modules in a new and innovative way to identify patients at risk of a potentially serious medication problem and efficiently direct scarce nursing time and energy. The development of the IT intervention, as well as a randomized study of outcomes for the non-cognitively impaired, is being supported by the Agency for Health Care Research and Quality (AHRQ; Grant number: 5R18HS017837). The intervention integrates a computerized algorithm into the home care agency IT system, using medication data that are electronically collected as part of usual care when patients are first admitted. This allows for the almost instantaneous computation of a medication regimen complexity index (MRCI) score for each patient. The index takes into account the dosing frequency, the number of different administration routes (e.g., oral, inhalant, injection) and the number of different special instructions a patient may need to remember (e.g., take with meals, take on alternative days, dissolve). The MRCI allows for a more nuanced indicator of complexity above a simple medication count. In addition, a medication complexity clinician decision support tool, developed earlier in 2009, has been integrated into the Visit Module. This tool provides guidance to field nurses on conducting a thorough medication reconciliation and a medication adherence assessment, along with strategies on how to communicate with the patient's primary care physician to work on simplifying the medication regimen. The decision support tool also provides strategies to improve self-management of medications. An initial clinical alert directing the nurse to a patient who has high medication complexity has been developed and will be emailed out shortly after the patient is admitted to home care.

For this Center for Technology and Aging-sponsored initiative, the intervention is being tailored to provide an additional automated clinical alert to the nurse indicating that the patient's cognitive impairment may put them at further risk for adverse events as well as provide tips on how to engage the caregiver in long-term medication management. Materials tailored to family caregivers will be created and disseminated.