Care Managers Use Software-Aided Medication Review Protocol for Frail, Community-Dwelling Seniors, Leading to More Appropriate Medication Use

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Innovation Contact Innovator

This innovation was identified by the AHRQ PSNet Editorial Team from the AHRQ Health Care Innovations Exchange. That resource, established by AHRQ in 2008, was retired in March 2021; AHRQ now offers select content from the Innovations Exchange, including its downloadable databases, through a microsite. This particular innovation was identified by the Editorial Team as one of continued interest and importance to AHRQ PSNet users and therefore was selected to be updated and included in this new section of the AHRQ PSNet website. To prepare this updated summary, the Editorial Team worked closely with representatives associated with the innovation. Updates include expanded use by other organizations, current program costs, additional results, considerations for planning and development, and ensuring accurate contact information.

Summary

Care management staff (such as nurses, community health workers, health coaches, social workers, or other clinical staff) use software-based protocols to screen older clients' medications and collaborate with pharmacists and physicians to reduce the risk of medication errors and adverse effects. The HomeMeds Medication Safety Program identified and addressed targeted medication problems, leading to fewer cases of therapeutic duplication and more appropriate medication use for cardiovascular medications, NSAIDS, psychotropics and overall medication use.

Innovation Patient Safety Focus

This innovation is designed to reduce potentially inappropriate prescribing and adherence causing medication-related problems among older adults, reducing their risk for medication errors and adverse events. The HomeMeds program facilitates post-hospitalization medication reconciliation, complements care transition coaching, identifies medication adherence issues, and supports other medication management interventions (e.g., medication dispensing and reminder systems).

Evidence Rating

Strong: The evidence consists of a randomized, controlled trial evaluating the percentage of participants with appropriate medication regimens (both overall and with respect to specific conditions) and the percentage who had duplicative medications eliminated, compared with the same metrics in a control group receiving usual care; the pre–post study evaluated medication changes made by physicians.

Resources Used and Skills Needed

- Staffing: Each program develops a relationship with a medication consultant, usually a pharmacist. Most implementers contract with a consultant pharmacist (paid on retainer, per consultation, or per hour), while others build relationships with academic pharmacists who supervise pharmacy school interns or volunteer their time. Typically, pharmacists charge approximately $65 to $85 per hour and can review two to four clients per hour, depending on the complexity and amount of information available. Complete home medication inventory is collected through a home visit– by a nurse, a social worker, navigator, or a community health worker. Programs collect this data which the software supports to prescreen certain alerts to further target use of the medication consultant and then inform the prescriber/care provider.

- Costs: Program costs include a modest one-time setup and training fee, along with a $260-per-month subscription for the software that covers up to 50 new clients per month. Training and startup consultation fees range from $7,300 to $9,300 per licensed implementation site, depending on training location. Regional multisite trainings can be arranged at a discounted rate. Return on investment (ROI) is similar to medication therapy management (4:1 or better) through annual review of medications, improved adherence to medications for chronic illnesses,

reducing risks for falls and hospital readmissions, and reducing use of high-risk medications.

Use By Other Organizations

The HomeMeds Medication Safety Program is currently implemented in 65 sites – including home health agencies, Medicaid waiver programs, Area Agencies on Aging, hospital transition programs, and preventative health programs – in 24 states in the U.S. HomeMeds is part of the US Administration for Community Living's Aging and Disability Evidence-Based Programs and Practices.

Date First Implemented

1993

Problem Addressed

Many community-dwelling seniors take multiple medications, putting them at risk for adverse events and medication errors. Seniors who use home health care services and Medicaid waiver programs (which offer support to frail seniors, helping them to avoid institutionalization) may be at especially high risk, as these clients typically have multiple conditions and are cared for by a variety of doctors, nurses, pharmacists, and family members. Medication reviews can potentially reduce these risks, but they tend to occur primarily in institutional (not community) settings.

- Preventable medication-related readmissions: One study found that 26 percent of readmissions were potentially preventable and medication-related, most often due to non-adherence and dosing problems.
- Polypharmacy in seniors, especially those with chronic conditions: Almost half of all seniors take at least 3 medications, and 75 percent of those with 3 or more chronic health conditions take 5 or more medications regularly. One study of ambulatory older adults with cancer found that 84 percent were receiving 5 or more medications and 43 percent were receiving 10 or more medications. Older home health care clients often take multiple medications.
- Inappropriate medication use, increasing risk of adverse events: An estimated 12 to 40 percent of community-dwelling older adults use medications inappropriately, including nearly half of seniors at risk of nursing home placement. Elderly home health and post-hospital or skill nursing facility

(SNF) clients are often frail and vulnerable, leaving them at increased risk of adverse drug effects and negative consequences from even relatively minor errors in medication administration. More than half of seniors who report taking prescription drugs have more than one doctor who prescribes the medicines, and about one-third use more than one pharmacy, factors that increase the likelihood of medication error.

- No routine medication review: Many community-dwelling seniors who take multiple medications do not benefit from the routine medication reviews that commonly occur in the nursing home setting or the hospital. Home-based medication review programs will become increasingly important as the number of medically fragile seniors who receive home health care and support from Medicare waiver programs continues to grow.

Description of the Innovative Activity

HomeMeds is a high-level evidence-based model using social workers or community health workers in the home as a health coach backed by an offsite consultant pharmacist. Home care staff use evidence-based protocols and associated software to screen older clients for potential medication-related problems and collaborate with pharmacists and physicians to reduce the risk of medication errors and adverse effects. HomeMeds can be used by home health agencies but is more frequently used in senior centers and often as part of partnerships with hospitals for post-hospital and post-nursing home care to reduce readmissions. The greatest strength of the program is that it puts a trained health coach into the patient's home to observe and compile a list of all prescribed medicines, over the counter medicines, supplements and herbal items, and occasionally the unexpected. Relying on the trained health coach to inventory these items is more effective than relying on a list of prescriptions provided by a pharmacy or dictated from memory by a patient before they leave the hospital or clinic. With this information, a trained pharmacist can begin to identify where hidden duplication of ingredients is taking place, where ingredients are working against one another, or items that are no longer effective in treating diagnosed issues.

Key elements of the system include the following:

- Collection of client information: Home care staff collect health information from the client, including vital signs (e.g., blood pressure, pulse rate), other clinical indicators (e.g., falls, dizziness, confusion), and medication use—usually as part of their normal in-home assessment process.

- Risk assessment via software: The care manager or nurse (sometimes supported by clerical staff) enters the client's clinical information and medication list into a computerized risk assessment screening system. The software alerts the user to potential medication problems using criteria developed by an expert panel. Based on the client's medication list and clinical indicators, the software identifies five types of medication problems common among frail, community-dwelling seniors:

    1. Unnecessary duplication, such as the routine use of two different antianxiety or acid-reducing agents, use of both a generic and brand name drug, or use of prescription and over-the-counter versions of the same drug.

    2. Signs of possible cardiovascular medication problems, such as poorly controlled hypertension, hypotension, slow pulse rate, orthostasis, or dizziness.

    3. Inappropriate use of anxiolytics, antidepressants, sleep aids, or other psychotropic drugs in clients with signs of confusion, a history of falls, or dizziness.

    4. Inappropriate use of nonsteroidal anti-inflammatory drugs (NSAIDs) in clients at risk of peptic ulcer complications or gastrointestinal bleeding.

    5. Effectiveness of opioid prescriptions and alternate options

- Review with client: If there are alerts of potential medication-related problems, the care manager follows up with the patient to verify the medication's dose and frequency as actually taken by the client and updates the medication list if necessary.

- Pharmacist review: The care manager contacts a consultant pharmacist, asking him or her to review the client's clinical information and medication list. The pharmacist may access the software directly or request a faxed profile or information via e-mail. The pharmacist verifies the regimen's appropriateness, identifies problems or concerns that warrant evaluation by the physician (including those not covered by the protocols), and develops recommendations for medication changes as appropriate.

- Physician notification and review: The pharmacist typically notifies the physician by faxed letter, but sometimes by telephone in more critical situations. Included in this notice is a request that the physician confirm receipt of the information and notify the care manager about any followup

actions. The physician reviews the patient's information and the pharmacist's recommendations, making changes to the medication regimen if appropriate.

- Followup: If the prescriber does not followup directly, the care manager will ask the client at the next visit or telephone call whether there have been any changes to the medication regimen and, if so, updates the information in the software as appropriate.

Context of the Innovation

Partners in Care Foundation offers a number of programs and services to thousands of clients in Southern California, including Medicaid waiver programs (one for South Los Angeles, one in the San Fernando and Antelope Valleys, one in Santa Barbara and one in Kern County), a disease prevention/health promotion program, and a caregiver support program—as well as an innovation, research, and evidence-based program dissemination center called the Institute for Change. In the mid-1980s, the home health nurses reported to management of the Visiting Nurse Association of Los Angeles (later converted to Partners in Care Foundation after sale of the home health business) that they suspected problems with their clients' medications and asked whether a consulting pharmacist could be enlisted to help. The positive experience resulting from this nurse-pharmacist collaboration prompted working with Vanderbilt University and the Visiting Nurse Service of New York on an RCT. The positive results and further testing in the Medicaid waiver program led the Partners in Care Foundation of San Fernando, CA to develop HomeMeds, as described in the Planning and Development section.

The John A. Hartford Foundation funded the research that established HomeMeds' effectiveness, and then funded efforts to develop software and disseminate the program nationwide. In 2003, Partners was awarded funding from the U.S. Administration on Aging to further develop HomeMeds, in which these highly skilled community health coaches, adept at patient engagement, and knowledgeable about community resources, visit the home of high-risk individuals to conduct a formal medication safety assessment, as well as an assessment of environmental, functional and psychosocial needs.

Results

External evaluations of the program—a randomized, controlled trial (RCT) by Vanderbilt University in home health programs, a followup pre–post study by the University of Southern California in Medicaid waiver programs, and a retrospective matched cohort study by the UCLA – found substantial and significant improvement in medication use and related outcomes. Program implementation

identified and addressed several common medication problems found among older adults, leading to fewer cases of therapeutic duplication and more appropriate medication use overall, including cardiovascular medications. Whereas in the original home health RCT study the program had no significant impact on appropriate use of psychotropic medications or NSAIDs, the subsequent pre–post study of the program's adaptation into Medicaid waiver programs showed significant and substantial change in medication use across all protocols.

- High proportion of Medicaid waiver clients had medication problems: In the followup study of 615 community-dwelling seniors served by California's Medicaid waiver program for nursing-home-eligible seniors, pharmacists following the four protocols identified potential problems with the medication regimens of 49 percent of patients, including 29 percent of clients who had a problem serious enough for the pharmacist to recommend a change in medication or a reevaluation by the physician. The physician concurred with at least one of the medication changes recommended by the pharmacist in 61 percent of these cases. The most common changes authorized by physicians involved therapeutic duplication, psychotropic medications (with 68 percent of patients on these medications having changes made), NSAID medications (50 percent), and cardiovascular medications (46 percent).

- Less duplication of drugs: Of program participants in the home health study who had duplicative medication issues, 71 percent were resolved, compared with 24 percent among patients receiving usual care. In the waiver study, 62 percent of pharmacist-confirmed therapeutic duplication problems were resolved.

- More appropriate overall and cardiovascular medication use: In the home health study, half of program participants had improvement in overall medication regimens, compared with 38 percent of patients receiving usual care. With respect to cardiovascular medications, 55 percent of participants had improved regimens, compared with 18 percent of those receiving usual care. The program had no impact on appropriate use of either psychotropic medication or NSAIDs. In the waiver program, 61 percent of pharmacist-confirmed problems had changes.

- Lower readmission risk: Patients receiving the HomeMeds program had a significantly lower predicted probability of 30-day readmission compared with matched controls (10.6% vs. 21.4%).

Planning and Development Process

Key elements of the planning and development process included the following:

- Hiring a geriatric pharmacist as consultant: The Visiting Nurse Association hired a staff clinical pharmacist to work as a consultant available to home health nurses concerned about their patients' medication regimens. Over time, the nurses and the pharmacist began to identify common medication-related problems and felt a need to rigorously study medication risk in this vulnerable population. In the UCLA work, the UCLA medical group has a pharmacist embedded in the practice and the medication and in-home assessment data are sent to them for review and for inclusion in the medical record and for needed follow up for care changes if needed.

- Asking an expert panel to formalize protocols: In 1993, for the home health study phase, Vanderbilt University researchers convened an expert panel to conduct a formal analysis of the common medication problems experienced by the home health population. The top problems were systematized into protocols and a preliminary screening algorithm for the randomized, controlled trial. In subsequent study phases, Partners in Care computerized the algorithm and protocols.

- Conducting an initial RCT: Vanderbilt University researchers conducted an RCT comparing use of the protocols and a structured collaboration that included pharmacist review with usual care by home health nurses, which confirmed the value of the intervention in identifying and resolving medication-related problems.

- Additional testing in expanded populations: In 1997, the Visiting Nurse Association was sold to Partners in Care Foundation, which continued the intervention. In 2003, Partners in Care received a 4-year dissemination grant from the U.S. Administration on Aging (AoA) to test the program in Medicaid waiver programs, which serves a population of nursing-home-eligible patients who tend to be older and more complex than home health clients. Recent research has assessed the use of the program in post-acute care settings.

- Expanding the program: Grants from the John A. Hartford Foundation and AoA enabled Partners in Care to disseminate the program in California and nationwide. Partners in Care developed a replication manual for use by would-be adopters. This manual (available only to organizations with a license) reviews the appropriateness of the program for a site and assists with implementation. HomeMeds is implemented in 65 sites in 24 states, including hospital and health systems, university pharmacist training programs, post-acute care transition programs, and fall prevention collaboratives. The

program is also being used by Area Agencies on Aging in a number of contexts —e.g., post-hospital care transitions, community-based care management, home-delivered meals, and senior centers—and in senior housing and other contexts where an in-home assessment is possible. Partners in Care has entered into contracts with medical groups and health plans to use HomeMeds as the core for in-home patient assessments and as part of post-hospital followup care. Partners in Care has recently developed the HomeMeds Plus Program, which aims to reduce emergency department and hospital readmissions through an individual client service plan based on medical risk, psychosocial and environmental assessments. Since January 1, 2011 HomeMeds has served 34,995 individuals aged 60 years and older. ,

- Electronic health record (EHR) integration: Partners in Care is upgrading the software for EHR integration towards the end of 2021.

- Ongoing protocol review and research: An expert advisory panel continues to review the protocols to ensure that they remain up to date, making additions or adjustments as necessary. For example, therapeutic duplication now includes more drug classes, using a national database, and the fall protocol has been expanded to include more psychoactive medications.

Resources Used and Skills Needed

- Staffing: Each program develops a relationship with a medication consultant, usually a pharmacist. Most implementers contract with a consultant pharmacist (paid on retainer, per consultation, or per hour), while others build relationships with academic pharmacists who supervise pharmacy school interns or volunteer their time. Typically, pharmacists charge approximately $65 to $85 per hour and can review two to four clients per hour, depending on the complexity and amount of information available. Complete home medication inventory is collected through a home visit– by a nurse, a social worker, navigator, or a community health worker. Programs collect this data which the software supports to prescreen certain alerts to further target use of the medication consultant and then inform the prescriber/care provider.

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rate. Return on investment (ROI) is similar to medication therapy management (4:1 or better) through annual review of medications, improved adherence to medications for chronic illnesses, reducing risks for falls and hospital readmissions, and reducing use of high-risk medications.

Funding Sources

The HomeMeds program has received funding from the Administration on Aging, the John A. Hartford Foundation, and the Partners in Health Foundation.

Getting Started with This Innovation

- Ensure readiness for change: Would-be adopters must make sure that the organizational culture supports a change of this nature. A readiness-for-change tool available through the Partners in Care Foundation Web site (http://www.HomeMeds.org) can assist with this step.

- Involve frontline staff: Supervisors may be enthusiastic about the program, but the system will only be used consistently and properly if the staff who will implement it understand and support bringing HomeMeds to their clients. Getting such support requires frontline staff to be educated about medication-related problems and the role of the pharmacist in helping improve the care of their clients. Social work care managers must also be convinced that this effort is within their scope of practice. In addition, care managers may be attracted to the potential to play an important role in identifying medication problems and thereby improving their clients' quality of life.

- Set expectations for staff: Not all alerts will result in a medication regimen change. As a result, care managers, social workers and nurses need to understand that their job is to collect comprehensive, up-to-date information (medications and signs and symptoms of adverse effects), use the software to screen for potential problems, and bring alerts to the attention of the consultant pharmacist. They should also understand that they are not accountable for clinical outcomes; the physician and the client will ultimately decide if changes need to be made.

- Plan logistics: Plan for program implementation at a detailed level. For example, adopting organizations should consider who will enter data into the system (care managers, social workers, nurses or clerical staff), whether all clients/patients will be screened, and how staff will be involved in followup and documentation.

- Start small: Consider starting with only new clients or with only one or two care managers, social workers, or nurses. Entering data for all clients at once can be overwhelming, often generating a high volume of alerts that must be investigated and resolved.

- Use opt-out approach: HomeMeds risk screening and problem resolution is important and should be included as a standard feature of home-based care. If agencies feel they must have consent, this should be done as an opt-out, rather than opt-in, approach. Consumer-oriented materials that explain the program are available from Partners in Care.

Sustaining This Innovation

- Make system a background process: If the system becomes part of normal operations, no extra effort will be needed to sustain it. This includes incorporating HomeMeds and the pharmacist contact with prescribers into client consents.

- Pay for direct costs: Training and startup, software subscription, and pharmacist services have been financed using a number of mechanisms, including Older Americans Act funds, Medicaid waiver purchase of services, Medicare medication therapy management, reimbursement for post-hospital care transition coaching, and direct payment by medical groups, health systems, and health plans.

- Share positive feedback: Physicians often express appreciation for the nurses, care managers, and pharmacists who have highlighted problems. Share details of this feedback to encourage ongoing use of the system.

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Date Verified by Innovator

Date Verified by Innovator indicates the most recent date the innovator provided feedback during the review process.

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