Medication problems plague people of all ages as well as families, caregivers, and the entire health care system.\(^1\) Medication errors among older people cost about $177 billion each year. If such errors were counted as a disease, they would be the fifth leading cause of death for Americans over 65.\(^2\)

### What are the key findings?

Studies of medication safety and adherence show how to reduce medication problems and help people take their medicines properly:

- **Reminders, feedback, and decision-support systems** lead to quality care by alerting clinicians to problems such as dosage errors, drug interactions, wrong medications, and patients who don’t follow medication instructions.
- **Fewer medications** reduce the likelihood of medication problems and make it easier for people to take medicine.
- **Packaging, memory and organizing aids** such as pillboxes or blister packs help people to use medications properly.
- **Research and national medication guidelines** suggest that medication “reconciliation” and reviews conducted by doctors, nurses or pharmacists reduce discrepancies and errors and help find potential problems such as drug interactions or unwanted side effects.
- **Multifaceted programs** that include ways to simplify medications, increase convenience, and provide counseling or support help people stick to their medication schedules.

Early studies of two medication management models designed for home health care produced promising results (see page 5).
Why is medication management central to home care for older people?

Effective Medication Management is vital if older people are to receive quality home health care. Here’s why:

- Most older home care patients take five or more medications, which often have complex instructions.3
- Medications are often new and unfamiliar when illness, injury or change in health status result in medication changes and the need for home health care.
- After a hospital stay, patients’ discharge information may not be clear about whether they should continue taking their prior drugs.
- One study found possible medication errors in 17 percent to 30 percent of all home health care cases.4

Medication problems may cause impaired function, admission to the hospital and even death. Effective medication management can ensure that people benefit from their medications and suffer no harm.

If people are to remain at home and in their communities as they age, they must skillfully manage their medications at home.

Medicare- and Medicaid-paid home health care requires that clinicians determine people’s ability to manage their medications. Whether home health patients improve in managing their medications before they are discharged is a publicly reported quality indicator posted on the Centers for Medicare and Medicaid Services (CMS) Web site (http://www.cms.hhs.gov/).

What does the research tell us about improving medication management?

Reminders, Feedback and Decision-Support Systems for Clinicians

Research shows that reminders, feedback 5, 6 and decision-support systems7 that help clinicians choose appropriate medications and monitor treatment have a positive impact on clinicians’ performance and help reduce medication problems. 5, 6, 7

Clinicians use “reminders” — information about a specific patient — as they plan a course of care.
Examples:

- An email alerting a clinician to a possible interaction with existing medications when a new prescription is written.
- A bright colored warning label on a chart reminding a nurse to monitor a patient for a specific medication side effect.

Similarly, clinicians use “feedback” — a summary of information about several patients gathered over time. Such information may influence future practice decisions.

Example:

- A report listing medications a physician has prescribed that could cause confusion or dizziness in older patients and suggesting alternatives that might have fewer side effects.

Available research underscores that impact varies with the form of the information — specifically:

- Feedback must come from a trusted source.
- It must have continued over at least a year to be effective.

“Decision-support systems” include reminders, feedback and guidelines that a clinician may use when considering a care plan.

- The systems can ‘push’ information to clinicians based on triggers or require clinicians to request the information.

Clinical studies of decision-support systems show that the more successful systems are:

- Computerized.
- Integrated in the workflow.
- Provide information when decisions must be made.
- Provide a recommendation—not just an assessment.

Research tells us...

Medication Reconciliation seeks to prevent omissions, duplications, dosing errors, and potential adverse interactions among a person’s medications. It involves: 1) developing a complete and accurate list of all medications a person is currently taking, 2) updating the list and repeating the comparison and reconciliation process whenever medication changes are made, 3) communicating the reconciled list to all appropriate clinicians, especially to the next provider of care, and 4) providing the list and effectively communicating its contents to the individual and the individual’s family caregivers. Medication reconciliation is usually the responsibility of a health care professional — a physician, nurse or pharmacist — working in tandem with patients and their families.

- The goal is complete, accurate, and current medication information for all patients and everyone involved in their care.
- Strategies used to reconcile medications include use of information technology; quality improvement approaches to upgrade documentation and information transfer; and incorporating reconciliation and review tasks into the clinical workflow.

Support for medication reconciliation currently comes from relatively small demonstrations and evaluations that yielded positive findings. These studies have found that medication reconciliation reduces medication discrepancies and potentially dangerous interactions, which can lead to unwanted emergency department visits, hospitals stays or other poor outcomes.

METHODS

Staff searched four databases (Medline, CINAL, AgeLine and GreyLit) between January and May 2008 to locate meta-analyses and systematic reviews in the six key practice areas. The searches included evidence-based guidelines and individual studies where systematic reviews or meta-analyses were not available. Two project investigators reviewed titles and abstracts to identify articles for full review. Tables with information abstracted from the reviewed articles were prepared for the National Advisory Council and are available at http://champ-program.org/framework/.

LIMITATIONS

Geriatric research is plentiful, but some topic areas lack a robust body of research evidence, even though expert guidelines may be available. Much research is descriptive, many intervention studies include small sample sizes, and evaluations often cannot isolate the effectiveness of individual intervention components due to reliance on multifaceted interventions and/or research design. In addition, relatively few rigorous research studies have focused on older adults in the home care setting. Thus generalizations about “what works best for whom” are necessarily limited, and it is possible that evidence about both the effectiveness of specific strategies and the relative value of different strategies will change as more research is done and more data become available.
**Research tells us...**

**Medication Review or Assessment** evaluates a person’s medications to reach agreement about drug therapy, optimize the impact of medications, and minimize the number of medication-related problems. To achieve quality care for older people, experts and national practice guidelines support in depth reviews, which involve more than reconciling medication discrepancies. Medication review may encompass a range of dimensions, particularly for older people. These include:

- Medication history — which medications are new? Which should be discontinued?
- Medication appropriateness — is a medication generally recommended for people 65 or older?
- Polypharmacy or medication complexity — can the person’s medication regimen be simplified to improve its effectiveness or encourage adherence?
- Barriers to medication adherence — can the older person self-administer medications? What other barriers may impede adherence and how can they be overcome?
- Medication absorption — is the drug being adequately absorbed, distributed and metabolized by the older person's body?
- Medication signs and symptoms — is there evidence that the person is experiencing an adverse drug reaction such as medication-induced delirium?

The research on medication review and assessment describes a variety of assessment interventions and examines a wide set of outcomes, including hospitalization, morbidity, mortality and quality of life. This research does not specify which interventions are most effective, and it has not shown consistent positive impacts across outcomes, studies or populations. Inconsistencies may result from difficulties in targeting the interventions, imperfections in study design and/or the multitude of factors, in addition to medication assessment, that influence patient outcomes.

Given the range of potential assessment interventions and variations in current research findings, additional research is needed to inform the redesign of interventions and help clinicians better target interventions to the people most likely to benefit. The fragmented health care system increases the risk that an older person with multiple conditions, medications, and health care providers will be harmed by incorrect or inappropriate medications. Reducing risk requires rigorous approaches to medication reconciliation and review.

**Improving medication adherence**

Research strongly supports three strategies to ensure that patients use medications correctly: 1) simplifying medications, 2) assuring the patient has support, and 3) using multifaceted programs that address an array of adherence barriers. Nevertheless, many reviews caution that the magnitude of improvements in adherence due to the interventions that have been studied is not large, or that patients need to be studied for longer periods of time to fully evaluate impact.

Packaging and arranging dosing to simplify taking medications has been shown to improve patients’ adherence. All the following make it easier for patients to take medications:

- Reducing the number of doses a person has to take.
- Combining medications into single pills.
- Using organizers such as dated blister packs and pill boxes.

Supporting and encouraging patients and their caregivers to properly follow medication regimens has been shown to be effective.

- Patients with a family caregiver helping with specific tasks (referred to as functional support) are more able to adhere to their medications.
- Specific devices to encourage patient adherence, such as contracts between patients and providers, and graphic aides have had mixed results.

Numerous multifaceted programs improve adherence, and multifaceted programs have been found to be more effective than single interventions. The intervention components typically found in multifaceted programs include:

- Education and counseling (in person, by phone, written materials).
- Tools that support development of skills (schedules, examples, rewards).
- Ways to increase convenience (simplified medications, automatic refills).

Currently available research studies have not been designed to isolate which components may be more successful than others. For example:

- Evidence is not conclusive about whether greater effectiveness results from tailoring intervention components to a specific individual’s situation.
- Attempts to compare the impact of combined interventions or categories such as educational and behavioral components have not identified differences.
What are the implications for home health care practice?

Older people increasingly rely on their medications to remain healthy. Medications should never cause harm; home care should ensure that older people benefit from their medications. Advances in health care delivery and technology help older people receive care in their own homes and communities. As the population ages, managing medications effectively must be a priority.

Based on current research, nurses and others working in home health agencies should work with older people, their families, and their physicians to:

- Compile and communicate accurate, complete, and current medication information.
- Assure that older people and everyone involved in their care understand the purpose of their medications and signs of potential problems.
- Simplify medications whenever possible given medical needs.
- Identify and address barriers to medication adherence.

To best achieve these ends, research suggests that home health care agencies should implement tools, reminders and decision support systems that support clinicians in their efforts to systematically assess, reconcile and manage medications.

Two models specifically developed to improve medication management in home health care embody these principles. They are:

**MMIS, the Medication Management Improvement System.**

The three main components of MMIS are: 1) a simple algorithm, based on data available in home health agencies, that identifies older home health patients at risk of medication problems; 2) a consulting pharmacist working with direct-care nurses to review potential medications and determine when a physician should reassess; and 3) sample “scripts” to help nurses to communicate and follow-up with the patient’s physician. More information is available at [http://www.homemeds.org](http://www.homemeds.org).

**The Geriatric CHaMP Program.**

CHaMP combines a quality improvement approach with an e-learning program to equip frontline nurse and therapy managers with team-building, practice improvement, and medication management skills. With these skills, frontline managers work with their staffs to improve care for older persons served by home health agencies. CHaMP’s medication management course focuses on: 1) using evidence-based geriatric medication practices, 2) using measurement tools to track progress, and 3) quality improvement techniques for integrating best practices into frontline care. More information is available at [http://champ-program.org](http://champ-program.org).

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### Understanding People Who Need Help with Medications

<table>
<thead>
<tr>
<th>Stage</th>
<th>Percentage of People aged 65+ in Home Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have at least one serious chronic condition</td>
<td>80%</td>
</tr>
<tr>
<td>Have a cognitive impairment</td>
<td>69%</td>
</tr>
<tr>
<td>Have a vision impairment</td>
<td>53%</td>
</tr>
<tr>
<td>Need help with grooming</td>
<td>35%</td>
</tr>
<tr>
<td>Have a hospital stay while in Home Care</td>
<td>14%</td>
</tr>
<tr>
<td>Median Length of Stay (LOS) in Home Care</td>
<td>66%</td>
</tr>
<tr>
<td>Need Help with Medications</td>
<td>30%</td>
</tr>
<tr>
<td>Able to Take Medications</td>
<td>38 Days</td>
</tr>
<tr>
<td>Median Days</td>
<td>29 Days</td>
</tr>
</tbody>
</table>

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**For More Information**

To learn more about CHaMP, the ongoing program to advance excellence in geriatric home health care, go to [http://champ-program.org/](http://champ-program.org/) or contact the Center at 212-609-6329, champ@vnsny.org.

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References


Credit for Data in Charts