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Epidemiology**University of Pennsylvania**Center for Health Equity Research
and Promotion,**Philadelphia VA Medical Center****Medication Comprehension and Safety in
Older Adults***

Editor's Note: Older adults constitute just 13% of the U.S. population, but consume 35% of all prescription drugs. They are at a particularly high risk of serious adverse events due to errors in medication-taking, but little is known about the instructions community-dwelling elders receive about their medications, or how they organize their medications at home. This Issue Brief summarizes research that describes home-based patterns of medication use in elderly patients, and for one high-risk medication, analyzes the relationship between recall of instructions and subsequent drug-related hospitalizations. These findings may help clinicians better predict and monitor their patients' adherence to prescription drug regimens.

***Medication adherence is
a function of receiving,
recalling, and following
instructions***

Most research on medication errors has emphasized error-prone systems in hospital settings. Less attention has been paid to the ambulatory care setting, despite the fact that out-of-hospital medication errors are likely to be more common. For community-dwelling patients, few systems currently exist to monitor drug administration and prevent medication errors in the home.

- In the outpatient setting, patients and their caregivers play a critical role in ensuring the safe use of medical therapies. Older adults taking high-risk medications need to receive clear, understandable information about how and when to take their medications, what to do with regard to food and missed doses, and how to spot dangerous side effects.
- Just as critical is the patient's ability to recall these instructions accurately. The form and frequency of instruction, as well as the patient's cognitive or sensory deficits, could affect this recall.
- Many older people take multiple medications, and might need a system to organize and manage their medication use. This might be particularly important in settings where older adults have multiple providers and/or fill their medications at multiple pharmacies.

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Study examines the practices of older adults taking high-risk medications at home

To understand current medication-taking practices of older people in the community, Metlay and colleagues surveyed nearly 5,000 members of a state-run program that provides prescription drug coverage to poor older adults. Those surveyed had recently filled a prescription for one of three drugs: warfarin, digoxin and phenytoin. These drugs were chosen because they carry a high risk of complications if not taken correctly.

- Study participants were members of the Pennsylvania Pharmacy Assistance Contract for the Elderly (PACE) program and the PACE Needs Enhancement Tier (PACE-NET) program. While the programs differ in income caps, both offer comprehensive prescription coverage to Pennsylvanians aged 65 and older who are not on Medicaid and meet low-income eligibility requirements.
- Participants completed a baseline telephone interview two to four weeks after filling a prescription and a follow-up interview at 12 months. The average age of study subjects was 79.
- Participants were asked if they recalled receiving instructions on the use of their medications, and about how they organized their medications. The survey included questions about functional status, depression, and cognitive impairment, all of which could affect recall of prescription advice and medication-taking practices.
- Based on the prescriptions filled at the time of enrollment, 48% of participants were taking warfarin, 41% digoxin, and 11% phenytoin. They were classified as either new users of a study medication (no prior claims within the previous 12 months) or chronic users (one or more claims for the same medication within the previous 12 months). Subjects were excluded if they resided in a skilled nursing home or assisted-living facility.

Problems with medication comprehension and organization remain common among the elderly

The results indicate that a substantial proportion of older adults do not recall receiving instructions on the use of their medications and do not take advantage of existing systems for organizing their medications.

- Thirty-two percent of subjects said that they had received no specific instructions about their medications, 35% said they had received instructions from their primary care provider, and 46% indicated they had received them from a pharmacist. The majority of patients who received instructions from their primary care provider received oral instructions, while the majority receiving instructions from a pharmacist received written instructions.
 - New users were slightly more likely to report receiving instructions than chronic users. Patients on warfarin were more likely to report instructions than those on digoxin or phenytoin.
 - Only 24% of subjects reported being asked to bring in all of their medications to review with their physicians and 39% reported being asked about their use of over-the-counter and complementary therapies at their office visits.
 - Forty-eight percent of participants on warfarin reported often or sometimes splitting their medication. This is especially disturbing given the fact that warfarin requires accurate dosing and even slight variations can increase risk of bleeding or clotting.
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- In terms of organizing medications, 54% of patients reported moving their medications from the pharmacy bottle to a pillbox with multiple compartments and filling the boxes themselves. However, 40% reported that they used no system at all.

Patient-report receipt of instructions for warfarin is associated with a reduced risk of serious bleeding events

Warfarin is frequently cited as a leading drug involved in preventable adverse drug events. Metlay and colleagues followed up with the 2,346 adults on warfarin to identify hospitalizations during the next two years. They interviewed subjects 12 and 24 months after enrollment, and obtained hospital data from a state-wide database to confirm hospitalizations that were likely to due to warfarin-related complications, such as excessive bleeding.

- The investigators identified 126 hospitalizations that were determined to be warfarin-related. The majority (67%) were gastrointestinal bleeds, 11% were intracranial bleeds, 3% were trauma-related, and 4% resulted in patient death.
- Patients who reported receiving medication instructions from a physician or a nurse, as well as a pharmacist, had a 60% reduced rate of a warfarin-related hospitalization in the subsequent two years.
- Patient report of receiving verbal instructions alone was not associated with a reduced risk of bleeding events compared to receiving no instruction at all.
- Having multiple providers was associated with greater risks for warfarin-related hospitalizations. Specifically, patients having four or more physicians prescribing medications had twice the risk, while those filling prescriptions at more than one pharmacy in the last three months had a 60% greater risk.

POLICY IMPLICATIONS

Prescription drug errors are a major cause of preventable hospitalizations in older adults, yet a substantial proportion of older adults taking such medications do not recall receiving instructions for their use. In this prospective study, patients on warfarin who did not recall such instructions were at increased risk for a serious bleeding event.

- Clearly, the failure to report receiving instructions from health care providers does not necessarily mean that instructions were not given. However, if patients cannot recall receiving any instructions, it seems likely that even if instructions are being provided, the instructional system is inadequate.
- These results point toward some potential interventions that might reduce the risk of medication-related health problems in older people. Although it is not clear whether more emphasis on oral or written communication is needed, it seems plausible that both methods are valuable. Improved communication about safe medication use could be provided through physician offices or pharmacies, or through direct-to-patient educational programs. Developing and testing these interventions should be a high priority.

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POLICY IMPLICATIONS

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- Since this study was conducted, new FDA regulations require the distribution of a medication guide with all warfarin prescriptions. Medicare now provides a reimbursement mechanism for providers to counsel about medications. The effectiveness of these interventions should be evaluated.
- The risk of warfarin-related hospitalizations, while low, is influenced by patient knowledge of medication instructions and by the number of medical and pharmaceutical care providers. Efforts to reduce the risk of bleeding for these patients should consider information systems that coordinate efforts among multiple providers and improve delivery of medication education to patients.

This Issue Brief is based on the following articles: J.P. Metlay, S. Hennessy, A.R. Localio, X. Han, W. Yang, A. Cohen, et al. Patient reported receipt of medication instructions for warfarin is associated with reduced risk of serious bleeding events. Journal of General Internal Medicine, October 2008, vol. 23, pp. 1589-1594; J.P. Metlay, A. Cohen, D. Polsky, S.E. Kimmel, R. Koppel, S. Hennessy. Medication safety in older adults: home-based practice patterns. Journal of the American Geriatrics Society, June 2005, Vol. 53, pp. 976-982.

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