Predictors of Older Adult Adherence With Emergency Department Discharge Instructions

Ivy Benjenk, BSN, MPH¹, Eva H. DuGoff, PhD, MPP¹,²,³, Gwen C. Jacobsohn, PhD⁴, Nia Cayenne, BS⁴, Courtney M. C. Jones, PhD, MPH⁵, Thomas V. Caprio, MD, MPH, MS⁶,⁷, Jeremy T. Cushman, MD, MS⁵,⁶, Rebeca K. Green, MPH⁴, Amy J. H. Kind, MD, PhD⁸,⁹, Michael Lohmeier, MD⁴, Ranran Mi, MA⁴, and Manish N. Shah, MD, MPH²,⁴,⁸

ABSTRACT

Objective: Older adults discharged from the emergency department (ED) are at high risk for adverse outcomes. Adherence to ED discharge instructions is necessary to reduce those risks. The objective of this study is to determine the individual-level factors associated with adherence with ED discharge instructions among older adult ED outpatients.

Methods: We performed a secondary analysis of data from the control group of a randomized controlled trial testing a care transitions intervention among older adults (age ≥ 60 years) discharged home from the ED in two states. Taking data from patient surveys and chart reviews, we used multivariable logistic regression to identify patient characteristics associated with adherence to printed discharge instructions. Outcomes were patient-reported medication adherence, provider follow-up visit adherence, and knowledge of “red flags” (signs of worsening health requiring further medical attention).

Results: A total 824 patients were potentially eligible, and 699 had data in at least one pillar. A total of 35% adhered to medication instructions, 76% adhered to follow-up instructions, and 35% recalled at least one red flag. In the multivariate analysis, no factors were significantly associated with failure to adhere to medications. Participants with poor health status (adjusted odds ratio [AOR] = 0.55, 95% confidence interval [CI] = 0.31 to 0.98) were less likely to adhere to follow-up instructions. Participants who were older (AORs trended downward as age category increased) or depressed (AOR = 0.39, 95% CI = 0.17 to 0.85) or had one or more functional limitations (AOR = 0.62, 95% CI = 0.41 to 0.94) were less likely to recall red flags.

Conclusion: Older adults discharged home from the ED have mixed rates of adherence to discharge instructions. Although it is thought that some subgroups may be higher risk than others, given the opportunity to improve ED-to-home transitions, EDs and health systems should consider providing additional care transition support to all older adults discharged home from the ED.

From the ¹Department of Health Policy and Management, School of Public Health, University of Maryland, College Park, MD; the ²Department of Population Health Sciences, School of Medicine and Public Health; the ³Division of Geriatrics and Gerontology, Department of Medicine, School of Medicine and Public Health; and the ⁴Department of Emergency Medicine, School of Medicine and Public Health, University of Wisconsin, Madison, WI; the ⁵Berkeley Research Group, Washington, DC; the ⁶Department of Emergency Medicine; the ⁷Department of Public Health Sciences; and the ⁸Department of Medicine, Division of Geriatrics, University of Rochester Medical Center, Rochester, NY; and the ⁹William S. Middleton Veterans Affairs Geriatrics Research, Education, and Clinical Center, Madison, WI.

Received March 31, 2020; revision received July 13, 2020; accepted July 27, 2020.

Supported by National Institutes of Health (NIH) award, grants R01AG050504 and K24AG054560, and a National Center for Advancing Translational Sciences Award, grant UL1TR000427.

Author contributions: Study concept and design—IB, EHD, GCJ, CMCJ, TVC, JTC, and MNS; acquisition of the data—IB, GCJ, NC, and RKG; analysis and interpretation of the data—IB, EHD, GCJ, RKG, RM, and MNS; drafting of the manuscript—IB and EHD; critical revision of the manuscript for important intellectual content—all authors; statistical expertise—EHD; and acquisition of funding—MNS. The authors have no relevant financial information or potential conflicts to disclose.

Supervising Editor: Tamnie E. Quest, MD.
Address for correspondence and reprints: Manish N. Shah, MD, MPH; e-mail: mnshah@medicine.wisc.edu.

ACADEMIC EMERGENCY MEDICINE 2020;00:0:1–11

© 2020 Society for Academic Emergency Medicine
doi: 10.1111/acem.14105
ISSN 1553-2712
Annually, over 20 million emergency department (ED) visits are made by older adults. While the sickest ED patients are admitted to the hospital, approximately 60% of older adult ED patients are healthy enough to be discharged home. The ED-to-home transition period is a vulnerable time for these individuals, because more than 10% of older adult patients discharged to home from the ED either are hospitalized or die within 30 days, and 22% return to the ED for further care. The vulnerability of older adults during these transitions has been recognized by the Society for Academic Emergency Medicine, the American College of Emergency Physicians, the Emergency Nurses Association, and the American Geriatrics Society in their multisociety Geriatric Emergency Department Guidelines.

Adherence to ED discharge instructions is important to facilitate a safe transition home. Previous work has found that focusing on medication adherence, follow-up appointments, and knowledge of clinical warning signs during hospital-to-home care transition for adult patients of all ages can reduce hospital revisits. Studies examining these domains of care during ED-to-home care transitions for adults of all ages have found generally low rates of adherence, with 69% to 88% of patients filling prescriptions for new medications, 29% to 67% following up with primary care providers, and 50% understanding reasons to return to the ED. Unfortunately, few studies have specifically focused on the transition from ED to home by older adult ED patients, who have high rates of conditions (e.g., depression, cognitive impairment) that may limit their capacity to access and use health care as well as engage in self-care behaviors. Consequently, little is known about the characteristics of community-dwelling older adult ED patients who adhere or do not adhere to instructions provided upon discharge.

The objective of this study was to measure rates of adherence to key care transition processes among older adult patients discharged home from the ED, particularly in the current era of value-based payment models, patient-centered medical homes, and electronic health records. Furthermore, we aimed to identify patient-level characteristics associated with nonadherence among this population.

**METHODS**

**Study Design and Setting**

We conducted a secondary data analysis of data collected from the control arm of a randomized controlled trial (RCT) of an ED-to-home care transition intervention (CTI) for community-dwelling older adults. The protocol for the RCT has been previously published. The subjects in the control arm of this trial received the usual ED discharge process, which is typically conducted by both the physician and the nurse at the institutions included in the study. All patients are provided with written discharge instructions printed from the electronic medical record (Epic). The study data contain comprehensive survey data verbally collected by research associates as well as abstracted EHR data from the participants’ ED and outpatient records. Study participants were enrolled in either the ED of an academic medical center in Madison, Wisconsin, or one of two affiliated academic medical center EDs in Rochester, New York. This study was approved by the institutional review boards at the University of Wisconsin and the University of Rochester.

**Selection of Participants**

Participants were recruited from the three EDs prior to discharge. Eligibility criteria for the primary study included age ≥ 60 years, English speaking, having a primary care physician within the ED’s health care system, community-dwelling, and having a working phone. Patients were excluded from the study if they were subsequently admitted to the hospital, stayed in the ED longer than 24 hours, were discharged from the ED to hospice or a long-term care facility, were homeless, had a transitional care team or intensive care management team in place, or were in the ED primarily for a behavioral health indication. If the patient (or their surrogate, if the patient lacked capacity) consented to the study, the patient was blindly randomized to the intervention or control group.

We did not include the treatment group for this study because those subjects received a care coordination intervention, interfering with the objective of this analysis. The control group of the study was composed of 881 subjects. We excluded 57 subjects due to missing data for a final analytic sample of 824. A post hoc comparison found that excluded individuals were similar the analytic sample with respect to age, sex, and number of chronic conditions.
Measurements
Care Transition Processes or “Pillars”. We selected care transition processes based on the CTI designed by Eric Coleman and colleagues. The CTI emphasizes that care transitions have a greater chance of success if patients feel knowledgeable about and can self-manage their condition as it pertains to the four conceptual areas known as “pillars.” These four pillars are: 1) medication self-management, 2) use of a personal health record, 3) primary care and specialist follow-up, and 4) knowledge of red flags. Care transition programs based on the CTI have been found to reduce readmissions among hospitalized older adults and increase older adult ED patients’ engagement in their care.

For this study, we examined three of the care transition pillars highlighted in the CTI model: medication self-management, primary care and specialist follow-up, and knowledge of red flags. We did not examine use of a personal health record because it is a unique component of the CTI and thus patients not receiving CTI-based care coordination services would not likely have one. We defined all three measures as binary variables: the patient either adhered to the pillar or did not adhere to the pillar.

We defined adherence with the medication self-management pillar as self-reported adherence with all routine medication instructions listed on the ED discharge instructions during a telephone survey conducted 4 days after discharge. These instructions include starting of new medications; stopping existing medications; or changing the dose, frequency, or timing of existing medications. If subjects were only given one medication instruction (e.g., start aspirin), they only had to follow the one instruction to be deemed adherent. If subjects were given multiple medication instructions (e.g., start acetaminophen, stop ibuprofen), they had to report changing each of the medications to be classified adherent. As part of their self-report, participants had to provide either generic name, brand name, classification, or purpose of each medication (e.g. Keflex, cephalexin, antibiotic, or medication for my infection). We did not assess the dosage, timing, or frequency of the medication. We included all subjects that had a recommendation to start, stop, or change a medication on their ED discharge instructions. We excluded medications with “as needed” instructions.

We defined adherence with the primary care and specialist follow-up pillar as having at least one in-person, telephone, or electronic (messaging through online patient portals) contact with their primary care provider or medical/surgical specialist within the time frame indicated on the ED discharge instructions, as documented in the patient’s EHR. For example, if the ED discharge instructions recommended following up within 3 days, we considered subjects to be adherent to the measure if they followed-up with any eligible provider within that time frame. All patients who contacted an eligible outpatient provider’s office (telephone or electronic) were counted as having followed-up, even if they did not schedule an in-person appointment or were unable to have one during the 30-day study window.

We defined adherence with the knowledge of red flags pillar as the ability to correctly recall at least one specific red flag listed on the discharge instructions during the 4-day postdischarge phone survey. We defined red flags as specific clinical signs and symptoms (e.g. nausea, back pain, swelling) that a patient was instructed to watch for and seek out medical care if observed. We excluded more general instructions (e.g., if symptoms return, any other concerns). We accepted red flags reported by subjects if they were similar to the red flags listed on the discharge instructions (e.g., weakness instead of fatigue or tiredness) or described the broader classification of red flags listed on the discharge instruction (e.g., signs of infection, instead of redness, swelling, warmth, bad smell, drainage, red streaks, or pus from wound). We did not require subjects to correctly specify severity or location associated with red flags listed on the discharge instructions (e.g., pain instead of chest pain or severe pain). This analysis only included subjects with specific red flags listed on their discharge instructions.

Characteristics. Based on the Aday-Andersen Health Behavior Model, we focused on individual-level characteristics that predispose one to use health services, enable one to use health services, and require one to use health services due to need. We examined the correlation of potential variables and excluded selected variables that were highly correlated with each other (e.g., marital status and living alone). Aside from age, we treated all variables as binary. Predisposing characteristics included age, sex, and race/ethnicity. Enabling resources included living arrangements, education, health literacy, feeling known by health care team, and length of time seeing primary care provider. Need variables included self-rated health, functional limitation, and alcohol abuse (defined as > 7 drinks/week for women or > 14 drinks/week for men based on National Institute on Aging guidelines) as
well as widely utilized screening tools for depression (Patient Health Questionnaire-9 or PHQ-9), anxiety (Generalized Anxiety Disorder-2 or GAD-2), symptoms of cognitive impairment (Blessed Orientation Memory Concentration Test or BOMC), and multimorbidity (self-reported Charlson Comorbidity Index or CCI). The GAD-2 has been validated with older adults in the general population and PHQ-2, the BOMC, and the self-reported CCI have all been validated with older adults in the ED. An advantage of using this model is that enabling and need factors have also been found to be predictors of patients’ ability to self-manage their conditions, a potentially important component of care transitions.

Data Collection
Research associates surveyed subjects while in the ED and by phone regarding their adherence to care transition processes 4 days after discharge from the ED. We abstracted information about the ED visit, including the content of ED discharge instructions from the EHR by one staff member and reviewed by a second staff member for quality assurance. The details of data collection have been described previously. Study data were collected and managed using REDCap.

We asked subjects to identify medications that they started, stopped, or changed and to identify red flags that they recalled during the 4-day postdischarge survey. We compared abstracted discharge instructions to subjects’ survey responses. Each medication and red flag listed on the discharge instructions was coded as either being adhered to or not adhered to. The coding guidelines were developed by the entire study team and were pilot tested with a test data set. A nurse reviewer (I.B.) coded medications, and the coding was validated by the emergency medicine physician reviewer (M.S.). Red flags were coded independently by two reviewers: a nurse reviewer (I.B.) and a trained research assistant (N.C.). The two reviewers discussed and resolved discrepancies through consensus. Unresolved discrepancies were adjudicated by the physician reviewer (M.S.).

Data Analysis
We used descriptive statistics to compare the individual predisposing, enabling, and need factors of the sample by eligibility and then by adherence among the eligible sample. We tested for significant differences in characteristics between adherent and nonadherent groups (bivariate) using chi-square tests. We also used multivariable logistic regression to examine the association between individual predisposing, enabling, and need factors and adherence to each pillar. Prior to running our model, we conducted several diagnostic assessments of our data including assessments of multicollinearity and influential outliers. We report the regression results as adjusted odds ratios (AORs) with 95% confidence intervals (CIs), which provide a sense of the precision of the estimates. All analyses were conducted in R statistical software.

RESULTS
Characteristics of Study Subjects
Of the 824 potential subjects in the study sample, the number of eligible subjects for each pillar’s analysis varied based on the content of their discharge instructions and the completeness of data obtained: 216 eligible subjects for medication adherence, 428 subjects for follow-up adherence, and 526 subjects for red flag adherence. Overall, 699 subjects were eligible for analysis of at least one pillar, and 125 were not eligible for any pillars. We used chi-square tests to compare differences in characteristics between subjects included and
excluded in each analysis, finding minimal differences (data not shown).

Table 1 presents the characteristics of the sample. Percentages were representative of the older adult population of the communities in which the study was conducted.35

Main Results

For the medication pillar, 35% of eligible subjects adhered to start, stop, and change instructions. For the follow-up pillar, 76% of eligible subjects followed up with an outpatient clinician within the

Figure 1. Observed rates of adherence to care transitions processes. A total of 35% of participants adhered to medication instructions, 76% adhered to follow-up instructions, and 35% exhibited knowledge of red flags listed on instructions.

Table 2
Comparisons of Characteristics Between Nonadherent and Adherent Groups in All Three Pillars

<table>
<thead>
<tr>
<th></th>
<th>Medication Management</th>
<th>Follow-up with Providers</th>
<th>Knowledge of Red Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nonadherent</td>
<td>Adherent</td>
<td>Nonadherent</td>
</tr>
<tr>
<td>Number (%)</td>
<td>140 (64.8)</td>
<td>76 (35.2)</td>
<td>104 (24.3)</td>
</tr>
<tr>
<td>Age (years), mean (±SD)</td>
<td>71.85 (±8.96)</td>
<td>72.66 (±8.93)</td>
<td>71.86 (±8.81)</td>
</tr>
<tr>
<td>Gender: female</td>
<td>78 (55.7)</td>
<td>40 (52.6)</td>
<td>52 (50.0)</td>
</tr>
<tr>
<td>Race: white</td>
<td>129 (92.1)</td>
<td>73 (96.1)</td>
<td>97 (93.3)</td>
</tr>
<tr>
<td>Education: not a college graduate</td>
<td>64 (45.7)</td>
<td>31 (40.8)</td>
<td>44 (42.3)</td>
</tr>
<tr>
<td>Living status: alone</td>
<td>45 (32.1)</td>
<td>21 (27.6)</td>
<td>33 (31.7)</td>
</tr>
<tr>
<td>Health literacy: inadequate</td>
<td>14 (10.0)</td>
<td>8 (10.5)</td>
<td>10 (9.6)</td>
</tr>
<tr>
<td>Medical team familiarity: poor</td>
<td>57 (40.7)</td>
<td>33 (43.4)</td>
<td>49 (47.1)</td>
</tr>
<tr>
<td>Primary care physician relationship &lt; 5 years</td>
<td>56 (40.0)</td>
<td>32 (42.1)</td>
<td>42 (40.4)</td>
</tr>
<tr>
<td>Chronic conditions: three or more</td>
<td>81 (57.9)</td>
<td>38 (50.0)</td>
<td>53 (51.0)</td>
</tr>
<tr>
<td>Alcohol abuse: at risk</td>
<td>15 (10.7)</td>
<td>8 (10.5)</td>
<td>10 (9.6)</td>
</tr>
<tr>
<td>Anxiety: Generalized Anxiety Disorder-2 score &gt; 3</td>
<td>16 (11.4)</td>
<td>13 (17.1)</td>
<td>17 (16.3)</td>
</tr>
<tr>
<td>Depressive symptoms: PHQ-9 score ≥ 10</td>
<td>15 (10.7)</td>
<td>9 (11.8)</td>
<td>8 (7.7)</td>
</tr>
<tr>
<td>Functional limitations: one or more</td>
<td>51 (36.4)</td>
<td>26 (34.2)</td>
<td>38 (36.5)</td>
</tr>
<tr>
<td>Self-rated health status: rated as fair or poor</td>
<td>27 (19.3)</td>
<td>16 (21.1)</td>
<td>26 (25.0)</td>
</tr>
<tr>
<td>Cognitive impairment: Blessed Orientation Memory Concentration score &gt; 10</td>
<td>31 (22.1)</td>
<td>12 (15.8)</td>
<td>26 (25.0)</td>
</tr>
</tbody>
</table>

Data are reported as n (%), unless otherwise stated. *p < 0.05, **p < 0.01.
Neither the bivariate analyses nor the multivariable logistic regression model identified significant differences in predisposing, enabling, and need factors in adherence to the medication pillar.

**Medication Pillar.** Neither the bivariate analyses nor the multivariable logistic regression model identified significant differences in predisposing, enabling, and need factors in adherence to the medication pillar.

**Follow-up Pillar.** Bivariate analyses did not yield any significant predictors of adherence to health care follow-up instructions. After regression adjustment, participants with poor health status were less likely to adhere to follow-up instructions (AOR = 0.55, 95% CI = 0.31 to 0.98).

**Red Flag Pillar.** Bivariate analyses found that with increasing age, subjects were less likely to be able to recall one or more red flags (Table 2, p < 0.01). Study subjects reporting depressive symptoms (12.8% vs. 4.9%, p < 0.01), who live alone (36.9% vs. 28.2%, p < 0.05), with less than a college degree (40.5% vs. 31.6%, p < 0.05), with low health literacy (11.3% vs. 5.3%, p < 0.05), with at least one functional limitation (39.5% vs. 24.3%, p < 0.001), or with symptoms of cognitive impairment (22.3% vs. 12.1%, p < 0.01) were also less likely to recall a red flag. In the regression model, older age (AOR = 0.96, 95% CI = 0.94 to 0.98), depressive symptoms (AOR = 0.39, 95% CI = 0.17 to 0.85), and having one or more functional limitations (AOR = 0.62, 95% CI = 0.41 to 0.94) were associated lower odds of recalling a red flag.

**DISCUSSION**

We found that among older adult ED patients discharged home, a low proportion reported adherence to medication instructions (35%) and recalled at least one red flag (35%) related to their illness 4 days after discharge. A better, but still less than ideal, proportion of patients (76%) adhered to follow-up instructions. Adjusted analyses did not identify a consistent set of individual-level factors associated with nonadherence for the three examined domains, preventing us from identifying a particular patient type at particularly high risk and in need of support. Thus, despite this era of value-based payment models, patient-centered medical homes, and electronic health records, we find that the typical discharge-to-home transition process leaves many older ED patients underprepared for self-managing their conditions at home and at risk of adverse events.

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Multivariable Analysis of Adherence in the Three Pillars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Medication Adherence</td>
</tr>
<tr>
<td>216</td>
<td>428</td>
</tr>
<tr>
<td>Age</td>
<td>1.03 (0.99–1.06)</td>
</tr>
<tr>
<td>Gender: male</td>
<td>0.96 (0.53–1.76)</td>
</tr>
<tr>
<td>Race: white</td>
<td>2.21 (0.62–10.49)</td>
</tr>
<tr>
<td>Education: not a college graduate</td>
<td>0.78 (0.40–1.48)</td>
</tr>
<tr>
<td>Living status: alone</td>
<td>0.86 (0.44–1.67)</td>
</tr>
<tr>
<td>Health literacy: inadequate</td>
<td>1.05 (0.36–2.90)</td>
</tr>
<tr>
<td>Medical team familiarity: poor</td>
<td>1.18 (0.65–2.16)</td>
</tr>
<tr>
<td>Primary care physician relationship: &lt;5 years</td>
<td>1.03 (0.56–1.89)</td>
</tr>
<tr>
<td>Chronic conditions: three or more</td>
<td>0.69 (0.36–1.30)</td>
</tr>
<tr>
<td>Alcohol abuse: at risk</td>
<td>0.75 (0.27–1.92)</td>
</tr>
<tr>
<td>Anxiety: Generalized Anxiety Disorder-2 score &gt; 3</td>
<td>1.98 (0.79–5.00)</td>
</tr>
<tr>
<td>Depressive symptoms: PHQ-9 score ≥ 10</td>
<td>1.01 (0.32–3.06)</td>
</tr>
<tr>
<td>Functional limitations: one or more</td>
<td>0.87 (0.44–1.67)</td>
</tr>
<tr>
<td>Self-rated health status: rated as fair or poor</td>
<td>0.62 (0.27–1.34)</td>
</tr>
<tr>
<td>Cognitive impairment: Blessed Orientation Memory Concentration score &gt; 10</td>
<td>1.28 (0.55–2.93)</td>
</tr>
</tbody>
</table>

Data are reported as AOR (95% CI). *p < 0.05. All variables included in the model are presented in the table.
Our findings are consistent with previous studies among ED patients of all ages examining patient comprehension of discharge instructions, which typically find low rates of comprehension and adherence. Studies have found that as many as one-third of adult patients do not understand their post-ED care instructions and that most patients with deficient understanding of their post-ED care are unaware of their lack of knowledge. A small study of 92 adults over 65 years of age found that over half did not understand the circumstances for which they should return to the ED.

One explanation of the low rates of adherence to the CTI discharge pillars is that ED providers do not emphasize these topics in the discharge process. Past research has shown that patients may be better able to follow instructions when instructions are meaningful and actionable, reviewed in an unhurried matter, and address language and physical disability barriers, which may be difficult to do in a busy ED environment. In a single urban ED study including patients of all ages, Rhodes et al. found that only 28% of ED patients are verbally educated on their medication instructions, only 24% are educated to follow-up, and only 20% were educated about red flags. The written discharge instructions themselves may be difficult to comprehend; a number of studies have found that ED discharge instructions are often at written at inappropriate high reading levels and many suffer from a large amount of complicated text.

Alternatively, patients may receive too much information during the discharge process, making it difficult to understand and remember what is most important. New instructions, which may conflict with prior information that they have received from their outpatient providers, may actually exacerbate treatment burden (patient’s perceived burden with health care regimen), which could contribute to non-adherence. Treatment plans need to be tailored to patient needs and level of self-management capacity. Whenever possible, family members and caregivers should be included in the discharge process to promote understanding and adherence. More work is generally needed to better support older adult ED patients being discharged home.

Another possible explanation of the low rates of medication adherence and red flag knowledge is that unrecognized cognitive impairment, which is common in the ED setting, may prevent patients from retaining the information provided. Other work has found that teach-back techniques improve patient comprehension of discharge instructions in the ED setting, but it is infrequently used in practice. Finally, it is important to consider that older adults typically have high rates of polypharmacy, which can add additional layers of complication when trying to explain additions or modifications to multiple medications (or even changing one of many).

While we found adherence to the medication pillar to be very low, in reality adherence with this pillar is likely even lower, because studies have found that self-reported information is overestimated. Compared to other studies of all adult ED patients, our adherence rate to medication instructions was lower; however, similar rates have been found in studies of older adults discharged from inpatient units. It is concerning that patients did not follow medication instructions because many of the medications prescribed, such as antibiotics for infections, are important interventions.

We did not find significant differences between individuals who adhered to their medication instructions and those who did not. This finding likely results from the relatively small number of patients in our sample who received instructions to add, change, or stop a regularly scheduled medication. Additional research is needed to understand why many older patients do not follow medication instructions. For instance, some may not understand their discharge instructions, experience barriers to filling their prescriptions or removing medications from prefilled medication boxes, or decide not to make the change without confirmation by their outpatient provider. Nonetheless, our findings support the call for EDs and health systems focus on transitional care in the ED context as a way to improve adherence, including options such as developing programs with pharmacist-based counseling, follow-up reminder phone calls, or on-site pharmacies.

We found similar rates for recall of red flags. Similar to the medication pillar, our approach likely overestimated patients’ knowledge of the reasons to seek further care, because patients who were able to name a single red flag were categorized positively. We also found that subjects who were older or depressed and had one or more functional limitations had the lowest rates of red flag recall. While it is not surprising that these are the characteristics of patients with the lowest rates of recall, it is especially concerning as they are also at higher risk for adverse events and declines in health and functionality. Due to their low rates of knowledge, as well as their general risk factors of...
adverse outcomes, EDs and health systems should consider additional care transition supports to reinforce the information given at discharge. These supports may include follow-up phone calls; telemedicine visits; or home visits from nurses, community health workers, or community paramedics. ED providers may also benefit from formal training on interpersonal and relational skills to enhance their ability to deliver and design patient-centered discharge instructions in a meaningful manner.

We found better rates of adherence to the follow-up pillar. Adherence may be higher than those seen in previous studies because we included both in-person and electronic (telephone and online) contacts or because of the primary care transformation occurring over the past decade. Both health systems in which the study was conducted participate in accountable care organization contracts. Under these contracts, providers are held accountable for the excess medical expenditures of their patients. To reduce preventable acute care utilization, both systems have interventions that could have contributed to the higher follow-up rates in our sample. That said, 24% of subjects that were deemed to require timely follow-up care did not receive that care within the recommended time frame, regardless of setting. Despite the changes in primary care, patients are still falling through the cracks and failing to receive necessary evaluation and monitoring.

LIMITATIONS

There are several limitations to this study. The sample reflects those who are willing to enroll in a RCT and may not be generalizable to the broader population of older adult ED users. Volunteer bias is a systemic issue in RCTs that may result in our findings being more positive than what may be seen in the broader communities. We also note that we drew on ED patients in midsized urban areas with higher education levels than the average older adult, limiting generalizability.

Because we did not directly observe ED encounters, we do not have data describing the details of the discharge process for each patient. As a result, we cannot include those factors in our analyses.

Our analytic sample was relatively small, especially for the medication pillar, which limited our ability to see differences in patient-level characteristic between our adherent and nonadherent groups. Thus, even though the point estimates for the AORs were notable, the CIs were wide. We measured follow-up adherence based on visits to providers within the ED’s health system. Because the subjects in our study all reported having a primary care physician in the health system, and local insurance plans strongly incentivize within-network care, we believe that this approach captured the vast majority of follow-up appointments.

CONCLUSION

Older adult ED patients discharged home after care have low rates of medication adherence, poor recall of red flags related to their illness, and better but still less-than-ideal rates of follow-up adherence. These findings may partially explain the high morbidity after ED discharge. EDs and health systems should consider providing additional care transitions supports, such as transforming the discharge process, for all older adults discharged home from the ED to address these deficiencies, rather than attempting to identify subgroups or characteristics of those more likely not to adhere to instructions.

References


60. Biese K, LaMantia M, Shofer F et al. A randomized trial exploring the effect of a telephone call follow-up on care plan compliance among older adults discharged home.


