

(Table 1). This association remained significant after controlling for the difference between groups in percentage living alone, which could influence quality of communication if the participant's caregiver was involved in transitional care coordination. Veterans with a stronger Spanish language preference were likely to have lower CTM scores (1 interview item, average CTM score 69.4; 2 items, average CTM score 66.7; 3 or 4 items, average CTM score 57.1). There was no difference in postdischarge medication-related symptoms (15.4% vs 14.3%;  $P = .92$ ) or 30-day hospital readmission (13.6% vs 19.0%;  $P = .56$ ) between bilingual and English speakers.

## DISCUSSION

Older Spanish–English bilingual veterans reported poorer communication quality related to care transitions than English-speaking veterans, as indicated by lower CTM scores, even though medication problems and hospital readmission were no different. These findings underscore the importance of ascertaining language preference even in individuals with some English proficiency, because the communication barrier may not be as evident to providers coordinating posthospital care. These findings indicate that components of transitional care may need to be customized for older adults whose preferred language is Spanish, even if they can communicate in English. It may also be necessary to involve professional language translators or caregivers fluent in English to close a communication gap.

Limitations include the sampling of Spanish-speaking veterans at a single tertiary care center, which may limit generalizability. In addition, there may be residual confounding because the sample size precludes multivariable adjustment. Spanish- and English-language proficiency was not directly assessed in study participants who indicated a Spanish-language preference. Although the U.S. military has used language tests in all service branches to ensure that all applicants can follow English commands,<sup>8</sup> the standards of English proficiency to follow commands may be substantially different from those needed for adequate understanding of managing one's health during care transitions.

## CONCLUSION

Quality of care transitions communication was lower for bilingual than for English-speaking older adults. Bilingual individuals without help at home may be at particular risk and should be targeted for enhanced language-sensitive transitional care.

Susanna S. O'Kula, MD

*Icahn School of Medicine at Mount Sinai, New York,  
New York*

Eve Gottesman, BS

Shatice Jones, BS

Daniel Signor, MS

*James J. Peters Veterans Affairs Medical Center, Bronx,  
New York*

William W. Hung, MD, MPH

Kenneth S. Boockvar, MD, MS

*Icahn School of Medicine at Mount Sinai, New York,  
New York*

*James J. Peters Veterans Affairs Medical Center, Bronx,  
New York*

## ACKNOWLEDGMENTS

We gratefully acknowledge the contributions of Courtney Dunn, MSW.

Presented in part at the American Geriatrics Society Annual Scientific Meeting, Seattle, Washington, May 2–5, 2012.

**Conflict of Interest:** The authors have no conflicts of interest to disclose.

**Author Contributions:** O'Kula, Boockvar: concept and design, acquisition of data, analysis and interpretation of data, drafting the article. Gottesman, Jones: acquisition of data. Signor: acquisition of data, analysis and interpretation of data. Hung: concept and design, analysis and interpretation of data, drafting the article. All authors revised the manuscript critically for important intellectual content and approved the final version.

**Sponsor's Role:** None.

## REFERENCES

1. Coleman EA. Falling through the cracks: Challenges and opportunities for improving transitional care for persons with continuous complex care needs. *J Am Geriatr Soc* 2003;51:549–555.
2. Karliner LS, Kim SE, Meltzer DO et al. Influence of language barriers on outcomes of hospital care for general medicine inpatients. *J Hosp Med* 2010;5:276–282.
3. Schyve P. Language differences as a barrier to quality and safety in health care: The Joint Commission perspective. *J Gen Intern Med* 2007;22:360–361.
4. Parry C, Mahoney E, Chalmers SA et al. Assessing the quality of transitional care: Further applications of the Care Transitions Measure. *Med Care* 2008;46:317–322.
5. Gandhi TK, Weingart SN, Borus J et al. Adverse drug events in ambulatory care. *N Engl J Med* 2003;348:1556–1564.
6. Katz S, Down TD, Cash HR et al. Progress in the development of the Index of ADL. *Gerontologist* 1970;10:20–30.
7. Lawton MP, Brody EM. Assessment of older people: Self-maintaining and instrumental activities of daily living. *Gerontologist* 1969;9:179–186.
8. History of Military Testing. The Official Site of the ASVAB Enlistment Testing Program [on-line]. Available at: [http://official-asvab.com/history\\_res.htm](http://official-asvab.com/history_res.htm) Accessed June 4, 2015.

## ADHERENCE TO MULTIPLE MEDICATIONS IN OLDER ADULTS WITH ASTHMA

*To the Editor:* Asthma is a common illness in older adults and contributes to more hospital admissions and deaths than in younger adults and children.<sup>1</sup> Low medication adherence to asthma-control medications such as inhaled corticosteroids may be an important contributor to high levels of asthma morbidity, because up to half of older adults with asthma fail to take them regularly.<sup>2</sup> Although various socioeconomic factors contribute to adherence practices in individuals of all ages, older adults are more likely to have multiple comorbidities and attendant polypharmacy. Competing priorities for care and complicated medication regimens in individuals with multimorbidity complicates self-management and may contribute to low adherence.

**Table 1. Adherence to Medications for Asthma and Comorbidities in Older Adults with Asthma**

| Condition Pairs                        | n   | Good Medication Adherence, n (%) |                      |                       |         | Kappa | Correlation Coefficient | P-Value |
|----------------------------------------|-----|----------------------------------|----------------------|-----------------------|---------|-------|-------------------------|---------|
|                                        |     | Both Conditions                  | First Condition Only | Second Condition Only | None    |       |                         |         |
| Asthma–hypertension                    | 227 | 60 (26)                          | 20 (9)               | 86 (38)               | 61 (27) | 0.14  | 0.16                    | .01     |
| Asthma–hypercholesterolemia            | 147 | 51 (35)                          | 12 (8)               | 48 (33)               | 36 (25) | 0.22  | 0.25                    | .02     |
| Asthma–diabetes mellitus               | 90  | 18 (20)                          | 6 (7)                | 39 (43)               | 27 (30) | 0.11  | 0.15                    | .2      |
| Hypertension–diabetes mellitus         | 85  | 45 (53)                          | 20 (24)              | 10 (12)               | 10 (12) | 0.16  | 0.27                    | .002    |
| Hypertension–hypercholesterolemia      | 121 | 71 (59)                          | 11 (9)               | 12 (10)               | 27 (22) | 0.56  | 0.46                    | <.001   |
| Hypercholesterolemia–diabetes mellitus | 64  | 39 (61)                          | 11 (17)              | 4 (6)                 | 10 (16) | 0.42  | 0.40                    | <.001   |

There is little research on patterns of adherence to inhaled corticosteroids and other medications in older adults with asthma with multimorbidity, a serious limitation for developing comprehensive self-management interventions for this population. Therefore, adherence behaviors to medications for asthma and comorbidities were evaluated in a cohort of older asthmatics.

## METHODS

Data from an observational study of 452 English- and Spanish-speaking adults aged 60 and older with a physician diagnosis of asthma of moderate or greater severity were analyzed. Individuals with other chronic respiratory diseases, a smoking history of more than 10 pack-years, and severe cognitive impairment were excluded. Of those included, 356 were prescribed asthma-control medications and included in the analyses. Three comorbid conditions (hypertension, hypercholesterolemia, diabetes mellitus) and the medications specifically used to treat them were focused on. Conditions and medications were identified according to self-report and confirmed using medical record review.

Adherence to asthma-control medications was assessed using the Medication Adherence Rating Scale. Good adherence was defined as a score of 4.5 or greater.<sup>3,4</sup> Adherence to hypertension, hypercholesterolemia, and diabetes mellitus medications was measured using the Morisky Medication Adherence Scale (good adherence, score >4).<sup>5</sup> Adherence scores for individuals taking multiple medications for the same condition were averaged.

The kappa statistic was used to assess the extent of within-participant agreement in their reports of adherence to medications for asthma and comorbidities and for their medications for different comorbidities ( $\leq 0.2$  poor, 0.21–0.4 fair, 0.41–0.6 moderate,  $>0.6$  substantial agreement). Spearman correlation coefficients ( $r$ ) were also calculated to compare medication adherence of different conditions.

## RESULTS

Of 356 participants, 64% had hypertension, 41% hypercholesterolemia, and 25% diabetes mellitus. Adherence to medications was 39% for asthma, 61% for hypertension, 70% for hypercholesterolemia, and 66% for diabetes mellitus. Similar low adherence patterns were observed in subjects with asthma and all three comorbidities, and overall adherence to medications for asthma and comorbidities was lower than adherence to medications for combinations of comorbidities (Table 1).

Adherence to hypertension and hypercholesterolemia medications (kappa = 0.56,  $r = 0.46$ ,  $P < .001$ ) and to hypertension and diabetes mellitus medications (kappa = 0.42,  $r = 0.40$ ,  $P < .001$ ) had the strongest agreement and correlation, whereas adherence to medications for asthma and comorbidities had considerably lower agreement and correlation (Table 1).

## DISCUSSION

Adherence to asthma medications weakly predicts adherence to medications for hypertension, hyperlipidemia, and diabetes mellitus, whereas adherence to medications for one of these comorbidities is a stronger predictor of adherence to another. The use of self-report limits these findings, but they are nonetheless important for clinical care because they demonstrate that within-individual adherence is inconsistent for asthma and comorbidities. Self-management support programs for individuals with asthma or other chronic diseases typically focus on individual conditions rather than considering the complexities of multiple comorbidities.<sup>6</sup> The current results highlight the importance of addressing adherence with individuals for all of their chronic illnesses and working with them to develop and implement strategies to self-manage their multiple medications effectively. Still, more research is needed to determine how people prioritize medication adherence for coexisting illnesses. Such work may contribute to improvements in education and self-management support for older adults with asthma with multimorbidity, and perhaps other chronic illness constellations, and better outcomes.

Emily R. Goodman, MS

Alex D. Federman, MD, MPH

Melissa Martynenko, MPA, MPH

Division of General Internal Medicine, Icahn School of Medicine at Mount Sinai, New York, New York

Rachel O'Connor, MPH

Michael S. Wolf, PhD, MPH

Division of General Internal Medicine, Feinberg School of Medicine, Northwestern University, Chicago, Illinois

Juan P. Wisnivesky, MD, DrPH

Division of General Internal Medicine, Division of Pulmonary, Critical Care and Sleep Medicine, Icahn School of Medicine at Mount Sinai, New York, New York

## ACKNOWLEDGMENTS

Research reported in this publication was supported by Grant 5R01HL096612 from the National Heart, Lung, and Blood Institute, National Institutes of Health.

**Conflict of Interest:** The authors declare no competing interests. JP Wisnivesky is a member of the research board of EHE International and has received consulting honoraria from Quintiles, BMS, and Merck and a research grant from Aventis Pharmaceutical. MS Wolf has received consulting honoraria from Luto UK.

**Author Contributions:** All authors contributed to this paper.

**Sponsor's Role:** None.

## REFERENCES

1. Cydulka RK, McFadden ER Jr, Emerman CL et al. Patterns of hospitalization in elderly patients with asthma and chronic obstructive pulmonary disease. *Am J Respir Crit Care Med* 1997;156:1807–1812.
2. Williams LK, Joseph CL, Peterson EL et al. Patients with asthma who do not fill their inhaled corticosteroids: A study of primary nonadherence. *J Allergy Clin Immunol* 2007;120:1153–1159.
3. Cohen JL, Mann DM, Wisnivesky JP et al. Assessing the validity of self-reported medication adherence among inner-city asthmatic adults: The Medication Adherence Report Scale for Asthma. *Ann Allergy Asthma Immunol* 2009;103:325–331.
4. Horne R. Compliance, adherence, and concordance: Implications for asthma treatment. *Chest* 2006;130:65s–72s.
5. Morisky DE, Ang A, Krousel-Wood M et al. Predictive validity of a medication adherence measure in an outpatient setting. *J Clin Hypertens* 2008;10:348–354.
6. Redelmeier DA, Tan SH, Booth GL. The treatment of unrelated disorders in patients with chronic medical diseases. *N Engl J Med* 1998;338:1516–1520.

## CASE REPORTS

### THERAPY-RELATED SPONTANEOUS PECTORAL MUSCLE HEMATOMA: A CASE REPORT AND REVIEW OF THE LITERATURE

*To the Editor:* Trauma to the chest wall or invasive medical procedures of the thorax are generally the cause pectoral muscle hematomas (PMHs), which is a rare condition.<sup>1,2</sup> Occasionally, there may be no history of trauma or invasive medical procedure, with hematoma occurring spontaneously. Blood thinners can be the under-

lying etiological agent.<sup>2–5</sup> This letter presents an unusual case characterized by spontaneous pectoral muscle bleeding in a woman undergoing warfarin therapy and reviews other spontaneous (nontraumatic) cases of PMH related to blood thinner medication.

A 79-year-old woman was hospitalized with the diagnosis of pneumonia and acute kidney failure. Piperacillin with tazobactam and furosemide infusion was initiated. Her medical history included Parkinson's disease, Alzheimer's disease, heart failure, and mitral valve replacement. She was taking memantine, warfarin, furosemide, lansoprazole, and a combination of levodopa, carbidopa, and entacapone. The day after she was hospitalized, a swelling approximately 5 cm in diameter developed in her right breast. Laboratory results were hemoglobin 8.6 g/dL (normal 12–16 g/dL), white blood cell count 9,510/ $\mu$ L (normal 3,500–10,500/ $\mu$ L), platelets 198,000/ $\mu$ L (normal 130,000–400,000/ $\mu$ L), international normalized ratio (INR) 7.74 (normal 0.8–1.2), alanine transaminase 28 U/L (normal 0–55 U/L), aspartate transaminase 51 U/L (normal 5–34 U/L), creatinine 1.67 mg/dL (normal 0.57–1.11 mg/dL). Ultrasonographic evaluation of the chest wall was consistent with PMH. She had no history of fall or trauma. The swelling grew over the subsequent few hours (Figure 1A). Computed tomography (CT) of the thorax showed a 14.7- by 14.2- by 8.6-cm PMH that was not in contact with the mediastinum or lung parenchyma (Figure 1B). The hematoma increased in diameter during follow-up. Tachycardia and hypotension developed consistent with the hemorrhagic shock. Four units of red blood cell suspension and three units of fresh frozen plasma were administered, leading to a decrease in INR to 1.3. Her hemodynamic condition improved, and there was no significant decline in repeated hemoglobin measurements. Right pectoral region pain was the only symptom. No symptoms or signs of new bleeding were detected during the rest of her hospitalization. Enoxaparin was recommended instead of warfarin for maintenance treatment.

Spontaneous PMH due to blood thinners is rare; four cases have been documented in the English-language literature,<sup>2–5</sup> although more cases have been reported in other languages. Clinically insignificant bleeding may not have been presented as case reports,<sup>6</sup> so the actual incidence may be higher. Table 1 presents a summary of the features of therapy-related spontaneous PMH cases. Various blood thinner medications may be the reason. The current case is

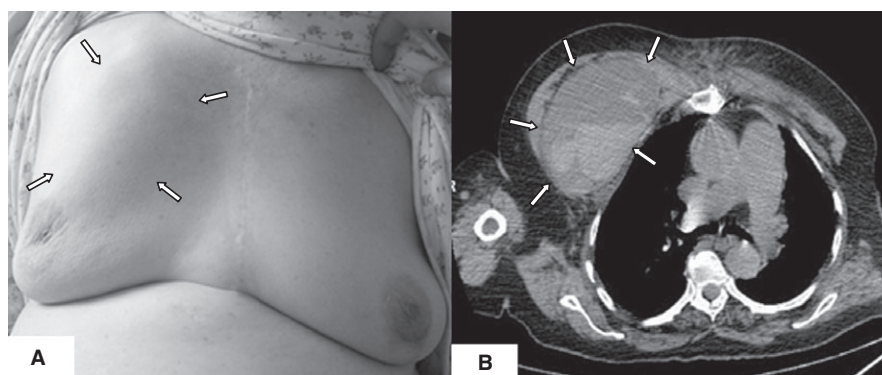


**Figure 1.** (A) Image of swelling of right anterior chest region caused by the pectoral hematoma. (B) Thoracic tomography image consistent with pectoral hematoma.