# Development and Initial Assessment of the Medication User Self-Evaluation (MUSE) Tool

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## ABSTRACT

**Background:** Using patient-reported data to supplement claims-based indicators may be helpful in identifying Medicare beneficiaries likely to benefit from medication therapy management (MTM) services.

**Objective:** Our objective was to develop and initially assess a patient medication user self-evaluation (MUSE) tool to identify Medicare Part D beneficiaries who would benefit from a comprehensive medication review.

**Methods:** A random sample of 225 patient medication profiles was created from a survey of Medicare beneficiaries; the survey also included demographic characteristics, responses to adherence questions, and reported symptoms. Three clinical pharmacists used the patient profiles to make judgments regarding the likelihood (low, moderate, or high) that each patient would benefit from an MTM visit in the next 3 months. A total of 150 cases were used for model calibration, and 75 were used for validation. Ordinal logistic regression models were fit to predict the likelihood of benefit from an MTM visit by using different combinations of potential MUSE items. Final model selection was based on the Akaike information criterion and the percent agreement between model prediction and expert judgments in the validation data. Measures considered for inclusion in the MUSE tool were related to medication use, medical conditions, and health care utilization.

**Results:** The final MUSE items incorporated number of medications, number of physicians, number of pharmacies, number of hospitalizations in the past 6 months, having forgotten to take medications, cost-related problems, and number of medical conditions.

**Conclusion:** The 7-item MUSE tool could be used in targeting MTM services, such as comprehensive medication reviews, among Medicare beneficiaries. (*Clin Ther*. 2013;35:344–350) © 2013 Elsevier HS Journals, Inc. All rights reserved.

**Key words:** comprehensive medication review, Medicare, medication therapy management, tool.

## INTRODUCTION

Medication therapy management (MTM) services, a required benefit for Medicare Part D beneficiaries meeting specific criteria, have been shown to decrease inappropriate medication use and potentially reduce overall health care costs.[1–3] Currently, the primary targeting mechanisms for MTM services in most Medicare Part D plans are based only on the number of conditions (at least 2), the number of medications (≥8), and estimated annual drug expenditure (at least $3000), following criteria set by the Centers for Medicare & Medicaid.[4,5] In most instances, prescription claims databases are used to identify beneficiaries who are eligible for MTM services. However, there are other risk factors for adverse outcomes associated with drug therapy problems that are not identifiable through claims databases. These factors include medication-taking behaviors and the use of medications for which no claim record is submitted (eg, $4 generic drug prescriptions), as well as recent hospitalizations. Using patient-reported data to supplement information obtainable in claims databases could improve identification of those patients most likely to benefit from MTM services, such as a comprehensive medication review (CMR). There is strong interest in increasing the frequency of CMRs because of their ability to improve

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medication use.[1] In addition, the Centers for Medicare & Medicaid has given high priority to CMRs for MTM programs and the potential for MTM programs to influence Medicare plan quality ratings.[4] Screenings for CMRs that use self-reported information could be conducted by pharmacists or perhaps through a health plan's Website. Pharmacists could then proceed with a CMR if warranted.

Two previous studies have examined self-administered questionnaires regarding medication-taking risks.[6,7] Both studies based their questionnaires on the 6 prognostic indicators for adverse outcomes validated by Koecheler et al[8] for a clinic population and tailored their questions for patient self-administration. The study by Levy[6] tested the correlation between each of the 10 items and a severity score based on drug regimen reviews; only 5 of the 10 questions showed significant relationships with the severity score. Langford et al[7] then used these 5 questions to screen adult ambulatory patients for pharmacist referral. Although the referral rates were higher in the intervention group that used the 5-item questionnaire, the medication-related problems were only evaluated in the 23 individuals who underwent a medication review. These initial studies did not include questions regarding cost-related barriers of access to medications or about potential complications from medication-related problems such as hospitalizations. Neither of the 2 studies used a statistical model to predict medication risk or likelihood of benefit from a pharmacist intervention, nor did either study assess the benefits of a medication review for those patients identified according to their tool results as likely to not benefit from a regimen review. Therefore, the main objective of the current pilot study was to develop and assess a brief medication user self-evaluation (MUSE) tool that could be used to identify Medicare Part D beneficiaries who could be targeted to receive a CMR.

## METHODS

Based on the literature and in conjunction with our research partner, OutcomesMTM (West Des Moines, Iowa), we developed a set of 10 questions that were considered for the current study. The study had 2 data sources. First, we used data from a cross-sectional survey containing information about health, health status, and medication lists. We also obtained clinical pharmacist judgments about those reported medications from the survey. For the survey, Harris Interactive Inc (Rochester, New York) maintains a panel of individuals who have double opted-in to be invited to participate in online surveys. For this study, a nonprobability sample of 1024 individuals aged ≥65 years, US residents, and Medicare beneficiaries were recruited from their panel. Using mostly previously published measures, information about prescribed medications, access and utilization of health care, and demographic characteristics were collected in the online survey. From the survey results, patient profiles were created in Microsoft Access (Microsoft Corporation, Redmond, Washington) for clinical pharmacist judgment and included sex, age, medication name, strength, directions, quantity taken in the past 30 days, reason for medication, adherence questions, and reported symptoms. The 3 (yes/no) adherence questions were part of the Morisky self-reported questionnaire to assess medication adherence that has been validated with blood pressure control and included: whether the patient had forgotten to take medication, whether he or she had been careless about taking medication, and whether he or she had stopped taking medications when feeling better or worse.[9] Respondents used a checklist of 10 symptoms to report their symptom experience during the previous month, as these symptoms had been used previously to identify potential adverse drug events.[10] This sampling approach provided a broader sample than those used in the previous studies; it also offered us a mechanism for gaining insights into the value of the questions when trained pharmacists make judgments about the potential benefit of a CMR using an individual's profile.

After excluding respondents who did not take any prescription medications on a regular basis or those who did not provide their medication lists, the Medicare survey respondents were stratified into 3 groups based on their self-reported number of regularly taken prescriptions: 1 to 3 medications, 4 to 6 medications, and ≥7 medications. This classification was intended to be able to evaluate the tool across patients using only few medications as well as those taking many. From each stratum, 75 respondents were randomly selected (225 total), which constituted the sample of data assessed by the 3 pharmacist judges. This intentionally resulted in an oversampling of subjects taking ≥7 medications and an undersampling in the other 2 strata; this method was designed to capture more individuals with higher risk profiles and to reduce the amount of