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## Brief Report

## Validation of the MEDSAIL Tool to Screen for Capacity for Safe and Independent Living Among Nursing Home Residents



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## A B S T R A C T

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**Objectives:** Capacity for safe and independent living (SAIL) refers to an individual's ability to solve problems associated with everyday life and perform activities necessary for living independently. Little guidance exists on the assessment of capacity for SAIL among nursing home residents. As a result, capacity for SAIL is not fully considered in the development of discharge plans to ensure safety and independence in the community. We reasoned that this problem could be addressed with the Making and Executing Decisions for Safe and Independent Living (MEDSAIL) tool, developed to screen for capacity for SAIL among community-dwelling older adults. In this report, we describe findings on the validity of the MEDSAIL when used with nursing home residents.

**Design:** Prospective cross-sectional pilot study.

**Setting and Participants:** Twenty-four residents of a Veterans Health Affairs Community Living Center (CLC; nursing home); exclusion criteria were cognitive impairment too severe to complete the protocol, diagnosis of serious mental illness or developmental disability, inability to hear, or inability to communicate verbally.

**Methods:** Participants completed 2 assessments: the MEDSAIL interview administered by a research assistant and the criterion standard capacity interview administered by a geriatric psychiatrist. We examined internal consistency, divergent validity, and criterion-based validity.

**Results:** Five of 7 MEDSAIL scenarios approximated acceptable levels of internal consistency ( $\alpha > 0.70$ ). MEDSAIL scores were highly positively correlated with criterion standard capacity determination ( $0.88, P = .001$ ), and the Wilcoxon rank-sum test statistic for the 2 assessments was also statistically significant ( $P = .001$ ).

**Conclusions and Implications:** MEDSAIL has promise as a user-friendly brief screening tool for use by nursing home staff to understand resident capacity for SAIL. This information can be used in the development of discharge plans to keep the resident safe and independent in the community. In addition, tailoring the MEDSAIL scenarios specifically to the nursing home setting may further enhance the tool's validity and utility in this new application. Published by Elsevier Inc. on behalf of AMDA – The Society for Post-Acute and Long-Term Care Medicine.

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Older adults prefer to live independently in the community for as long as possible.<sup>1</sup> In support of this preference, greater emphasis has been placed on rebalancing long-term services and supports in recent years, moving care from residential facilities to the community.<sup>2</sup> Nursing home staff routinely make tough decisions about resident choices and preferences, including which residents are ready for discharge to the community and the types of services and supports necessary to keep them safe.

Transitions of care represent a period of increased risk for older adults.<sup>3–6</sup> Key to improving discharge from nursing homes is understanding how the older adult functions in the context of the living environment.<sup>7</sup> According to the model of person-environment fit,<sup>8</sup> finding an equilibrium between the needs and abilities of a person and the demands and supports available in the environment will yield maximum functioning, allowing a person to live safely in the least restrictive environment possible. We use the term capacity for safe and independent living (SAIL) to describe an older adult's ability to solve problems associated with everyday life<sup>9</sup> and to perform "a broad array of activities considered essential for independent living."<sup>10</sup> Older adults with low levels of capacity for SAIL are at risk for unwanted outcomes, including frequent hospital and emergency department visits, long-term care entry, morbidity, mortality, abuse, and neglect.<sup>11–15</sup>

In Veterans Health Administration nursing homes (Community Living Centers; CLCs), interdisciplinary teams may benefit from greater access to disciplines involved in making determinations about capacity for SAIL, including mental health providers, occupational therapists, and physical therapists. However, community nursing home staff lack ready access to these disciplines and traditionally receive little, if any, training on the assessment of capacity for SAIL, and few standardized instruments are available.<sup>16–21</sup> The Resident Assessment Instrument,<sup>22</sup> administered to all nursing home residents at admission, then readministered annually and following a status change, measures cognition and decision making (eg, the resident knows scheduled meal times). However, these items are not sufficient to judge capacity for SAIL in the community. In previous work, we developed a screening tool, Making and Executing Decisions for Safe and Independent Living (MEDSAIL),<sup>23</sup> for health and social service providers to screen for capacity for SAIL in community-based older adults. Reasoning that MEDSAIL may have applications in the nursing home setting, we examined the psychometric properties of MEDSAIL when used with nursing home residents.

## Methods

### Design

We performed a prospective cross-sectional pilot test of the MEDSAIL in the nursing home population by conducting interviews with CLC residents and abstracting data from the electronic medical record. The presentation of our findings is guided by the STARD checklist<sup>24</sup> for the reporting of studies of diagnostic accuracy. This study was approved by the Institutional Review Boards at Baylor College of Medicine and Michael E. DeBakey VA Medical Center in Houston, TX.

### Setting

The study was conducted in the Community Living Center (nursing home; CLC) at Michael E. DeBakey VA Medical Center, consisting of 4 units with 141 beds. The units provide long-stay care, short-stay rehabilitation, and hospice/palliative care. The hospice unit was not included in the study.

### Participants

CLC medical records were screened by a geriatrician to identify potential participants. Residents were excluded from participation for indications of cognitive impairment severe enough to preclude them from completing the assessment based on documented diagnosis of severe dementia, medications, and provider notes. Additional exclusion criteria (as indicated in the medical record) included a diagnosis of serious mental illness or developmental disability, inability to hear even with assistive devices, or inability to communicate verbally even with assistance. The research assistant obtained consent from residents who were able to provide informed consent based on their ability to teach back elements of the consent form. For those who could not provide consent, the legally authorized representative was contacted to obtain consent and the resident was asked to give assent. Participants were asked to complete 2 separate assessments: the MEDSAIL interview administered by the research assistant and the criterion standard capacity interview administered by a geriatric psychiatrist.

## Measures

### MEDSAIL

MEDSAIL consists of questions that elicit responses to 7 decision-making scenarios an older adult might encounter in everyday life (eg, "You run out of a medication that you take regularly").<sup>23</sup> MEDSAIL takes less than 15 minutes to administer. The interviewer first chooses 2 scenarios most relevant to the respondent's situation and then, for each scenario in turn, asks the respondent a series of questions based on 5 domains: understanding, appreciation, expressing a choice, reasoning (problem solving/consequential reasoning and comparative reasoning), and generating consequences. These domains are derived from established theoretical frameworks for evaluating capacity to consent to medical decisions.<sup>16,18,19,25</sup> MEDSAIL differs from traditional cognitive assessments because it encourages administrators to prompt respondents to elaborate or clarify responses, which is consistent with research supporting the need to probe within narrow criterion standards to establish capacity for SAIL effectively. Each domain is scored in terms of logic and completeness of the response on a scale of 0 to 2 (0 = no response or illogical/incomplete, 1 = logical, but incomplete, 2 = complete and logical). Each scenario can have a maximum score of 10 points and the final score is an average of scores from the 2 scenarios. MEDSAIL was administered by a research assistant with a master's degree who documented responses through both audio recordings and written notes. Audio recordings of interviews were transcribed and MEDSAIL scoring was completed by a member of the team blinded to ability to provide consent and findings of the criterion standard interview.

### Criterion Standard

Trained geriatric psychiatrists conducted an interview with residents based on the standardized physician assessment to make formal determinations of capacity for the Harris County, Texas, court system.<sup>26</sup> Domains included in this assessment include physical condition (physical diagnosis, severity, prognosis, and treatment history), mental functioning (mental diagnosis, severity, prognosis, and treatment history), cognitive deficits (orientation to time and place), ability to make responsible decisions across a variety of domains (eg, financial decisions, operating a motor vehicle, marriage, and administer own medications), and developmental disability (presence of an intellectual or developmental disability). This assessment combined with clinical judgment results in a determination of full, partial, or no decision-making capacity.

## Montreal Cognitive Assessment

The geriatric psychiatrists also administered the Montreal Cognitive Assessment (MoCA), which is a brief 30-item test of cognitive impairment.<sup>27</sup> Scores range from 0 to 30, with scores greater than 26 considered normal. In the initial study, older adults with mild cognitive impairment had mean scores of 22.1 and persons with Alzheimer's disease scored a mean of 16.2.<sup>27</sup>

## Patient Health Questionnaire 9

The Patient Health Questionnaire 9 (PHQ-9)<sup>28</sup> is a 9-item assessment based on diagnostic criteria for depression focused on the patient's experience of symptoms over the prior 2 weeks. Scores on the PHQ-9 range from 0 to 27, with scores greater than 10 indicative of the presence of depression. PHQ-9 is widely used in the nursing home setting, and participant scores were abstracted from the electronic medical record.

## Activities of Daily Living

The Activities of Daily Living (ADL) assessment consists of 7 items: bed mobility, transfer, locomotion, dressing, eating, toilet use, and personal hygiene. For each item, scores range from 0 (total independence) to 4 (total dependence). The total score is a sum of the scores on the individual items ranging from 0 to 28, with higher scores indicating greater dependence.<sup>29</sup> Participant scores were abstracted from the electronic medical record.

## Resident Characteristics

From the CLC's electronic medical record database, we abstracted the following additional data for residents who enrolled in the study: sex, age, race/ethnicity, marital status, delirium (Confusion Assessment Method), and active neurologic diagnoses (eg, Alzheimer's disease, dementia, stroke).

## Analyses

Data were summarized using descriptive statistics. To determine internal consistency of the scenarios, Cronbach alpha coefficients were calculated. To determine divergent validity, we examined the correlations between MEDSAIL scores and items that would not be expected to correlate with capacity for SAIL (ie, MoCA, PHQ-9, and ADL). To test criterion-based validity, we examined correlation of MEDSAIL scores with criterion standard capacity determinations and performed a Wilcoxon rank-sum test to compare the mean ranks of the 2 assessments.

## Results

### Descriptive Statistics

Thirty CLC residents were enrolled in the study with 25 completing both the MEDSAIL and criterion standard interviews. For those who did not complete both interviews, reasons included leaving the CLC ( $n = 3$ ) and no longer feeling well enough to participate ( $n = 2$ ). One participant was excluded from the analyses for being an extreme outlier, leaving a total sample size of 24. Participant characteristics and assessment scores are presented in Table 1. Overall, participants had a mean age of 68.2 years, 50% were white, and 25% were married. All participants were male.

**Table 1**

Participant Characteristics Overall and by Capacity Group

|                     | No Capacity<br>(n = 5) | Partial Capacity<br>(n = 6) | Full Capacity<br>(n = 13) | Overall<br>(n = 24) |
|---------------------|------------------------|-----------------------------|---------------------------|---------------------|
| Age                 | 70.2 (9.7)             | 76.3 (5.0)                  | 63.7 (6.3)                | 68.2 (8.5)          |
| Race, n (%)         |                        |                             |                           |                     |
| White               | 3 (60)                 | 3 (50)                      | 6 (46)                    | 12 (50)             |
| African American    | 2 (40)                 | 2 (33)                      | 5 (39)                    | 9 (38)              |
| Other               | 0                      | 1 (17)                      | 2 (15)                    | 3 (13)              |
| Married, n (%)      | 2 (40)                 | 1 (17)                      | 3 (23)                    | 6 (25)              |
| MEDSAIL             | 3.6 (0.7)              | 6.0 (1.7)                   | 8.5 (0.9)                 | 6.9 (2.3)           |
| MoCA                | 13.0 (8.3)             | 16.5 (3.4)                  | 24.8 (2.4)                | 20.3 (6.7)          |
| PHQ-9               | 2.0 (2.8)              | 3.2 (3.7)                   | 0.8 (1.5)                 | 1.6 (2.6)           |
| ADL                 | 3.4 (5.0)              | 1.0 (2.0)                   | 1.5 (2.1)                 | 1.75 (2.9)          |
| CAM                 | 0.4 (0.9)              | 0                           | 0                         | .08 (0.4)           |
| Diagnoses, n (%)    |                        |                             |                           |                     |
| Alzheimer's disease | 0                      | 1 (17)                      | 0                         | 1 (4)               |
| Dementia            | 1 (20)                 | 1 (17)                      | 0                         | 2 (8)               |
| Stroke              | 1 (20)                 | 0                           | 0                         | 1 (4)               |

Unless otherwise noted, values are mean (standard deviation).

## Internal Consistency

We examined the internal consistency of the 5 domains (appreciation, expressing a choice, problem solving, comparative reasoning, and generating consequences) tested in MEDSAIL using Cronbach alpha. All participants completed scenario 1 and a randomly chosen second scenario. Scenario 6 was randomly chosen and completed by only 1 person; therefore, it is not considered in the internal consistency analysis. Five scenarios approximated acceptable internal consistency ( $\alpha > 0.70$ ), ranging from  $\alpha = 0.68$  to  $\alpha = 0.83$ ; only scenario 5 was low ( $\alpha = 0.10$ ).

## Criterion-Based and Divergent Validity

Table 2 presents the descriptive statistics for MEDSAIL individual scenario and final scores, and Table 3 presents correlations of MEDSAIL final scores with divergent measure scores. Given that few residents in our study sample were determined to have no capacity, we combined the No Capacity and Partial Capacity groups for analysis and reporting. As seen in Table 2, mean scores for both scenarios and mean final scores are noticeably ( $\sim 75\%$ ) lower for the No Capacity + Partial Capacity than for the Full Capacity group, and the difference is statistically significant ( $P < .01$ ). This finding is corroborated by both the high correlations of the criterion standard and MEDSAIL scores and their ranks (0.88 and 0.83, respectively, and statistically significant at  $P = .001$ ) and the Wilcoxon rank-sum test statistic for the ranks of the criterion standard determinations and MEDSAIL scores (statistically significant at  $P = .001$ ). Within both groups, mean scores for the second scenario are higher than those for the first scenario, but the difference is only statistically significant for the Full Capacity group.

**Table 2**

Descriptive Statistics for MEDSAIL Individual Scenario Scores and Final Scores, No Capacity and Partial Capacity Groups Combined

|                                                    | No Capacity + Partial<br>Capacity, Mean (SD)<br>(n = 11) | Full Capacity,<br>Mean (SD)<br>(n = 13) | Total,<br>Mean (SD)<br>(N = 24) |
|----------------------------------------------------|----------------------------------------------------------|-----------------------------------------|---------------------------------|
| MEDSAIL scenario 1 score                           | 4.7 (2.0)*                                               | 8.1 (0.8)                               | 6.6 (2.3)                       |
| MEDSAIL randomly selected<br>second scenario score | 5.1 (1.8)*                                               | 8.9 (1.1)                               | 7.1 (2.4)                       |
| MEDSAIL final score                                | 4.9 (1.8)*                                               | 8.5 (0.9) <sup>†</sup>                  | 6.9 (2.3) <sup>†</sup>          |

\*Within-scenario, group-wise mean difference from Full Capacity significant at  $P < .01$ .

<sup>†</sup>Within-group, scenario-wise mean difference significant at  $P < .05$ .

**Table 3**

Correlations of MEDSAIL Final Scores With Convergent and Divergent Measure Scores, No Capacity, and Partial Capacity Groups Combined

|                                          | No Capacity +<br>Partial Capacity<br>(n = 11) | Full Capacity<br>(n = 13) | Total<br>(N = 24) |
|------------------------------------------|-----------------------------------------------|---------------------------|-------------------|
| MEDSAIL final score<br>correlation with: |                                               |                           |                   |
| MoCA                                     | 0.28                                          | 0.34                      | 0.72*             |
| PHQ-9                                    | 0.34                                          | 0.00                      | −0.15             |
| ADL                                      | −0.35                                         | −0.33                     | −0.29             |

\*Within-group correlation significant at  $P < .01$ .

( $P < .05$ ). In Table 3, correlations between MEDSAIL scores and overall MoCA scores were statistically significant ( $P < .01$ )

## Discussion

This study examined the psychometric properties of the MEDSAIL screening tool in a pilot sample of nursing home residents, a new and somewhat different population for applying this tool. Our findings provide positive early evidence for validity of the MEDSAIL in a nursing home population, given the observed strong correlation of MEDSAIL scores with independent determinations of capacity by trained geriatric psychiatrists. The observed low correlation between MEDSAIL and the measure of cognition is consistent with our previous validation work.<sup>23</sup> The constructs assessed in typical measures of cognition are not sufficient to determine capacity for SAIL. Mean MoCA scores for our sample were low in general, with the mean score for the full capacity group (24.8) still below the “normal” classification.

We acknowledge that the current study has important limitations, including a small sample size. The site for this study primarily functions as a short-stay nursing home, which created a short window to identify potential participants, obtain consent, and complete the MEDSAIL and criterion standard interviews. The lengthy process for obtaining consent from legally authorized representatives challenged our ability to recruit participants with lower capacity for SAIL.

Contrary to earlier validation work with community-dwelling older adults,<sup>23</sup> the current study identified issues with internal consistency, particularly for scenario 5. Further analysis of scenario 5 revealed that removing a single item (“What would you do to prevent yourself from getting calls like this in the future?”) from that scenario would have the effect of increasing alpha to the acceptable range. Anecdotally, respondents sometimes struggle to identify responses for this item regardless of level of capacity, likely because of lack of familiarity with effective options to stop unwanted telephone calls. This is a finding we will explore in future validation work. In addition, logical next steps include developing scenarios relevant to the decisions encountered daily in residential care settings, particularly related to discharge care planning, exploring use of MEDSAIL in new populations (eg, persons with serious mental illness), and testing administration of MEDSAIL by nursing home staff. A larger-scale study with even representation across the capacity spectrum is also warranted to examine issues with internal consistency and to determine cut scores that are clinically meaningful.

## Conclusions and Implications

Comprehensive assessment for capacity is time intensive and requires access to health care providers from a number of disciplines, which may be challenging in typical nursing home settings. Capacity has traditionally been conceptualized as a global domain, but increasingly, the focus is shifting to narrow domain-specific capacities (eg, medical decision-making, voting, research).<sup>30</sup> MEDSAIL provides

an efficient approach to screening for the domain-specific capacity for SAIL that can be used by any member of the interdisciplinary team. In considering capacity for SAIL, nursing home staff have quick access to assessments of cognition and ADL. These instruments may assess deficits in executive function but do not evaluate the ability to “implement and adapt plans, especially when faced with predictable and unexpected challenges,”<sup>31</sup>(p5267) which is critical for executive capacity. Such cognitive assessments also do not give the administrator the opportunity to probe the respondent to allow for reasonable explanations for a decision that one might deem inappropriate at a surface level. ADL assessments provide information on an older adult’s ability to perform physical activities in their daily life, which is an important component of a comprehensive assessment of capacity for SAIL, but alone lacks focus on decisional or executive capacity. Our findings indicate that, with further tailoring to the nursing home context, MEDSAIL holds promise as a time-saving and more nuanced approach to screening for capacity for SAIL in nursing home residents. Understanding capacity for SAIL as the domain-specific capacity that applies to resident-centered discharge planning can improve outcomes for older adults as they return home.

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