



Screening for Functional Cognition Using a Simple to Score Performance-Based Test of Cognition & Medication Management

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Introduction

- The center for Medicare and Medicaid services has identified functional cognition as an important domain for screening in post-acute settings
- Performance-based screening tools of functional cognition are used by occupational therapists to identify whether an individual is at high risk for impaired functional cognition significant enough to impair essential IADLs and community independence^{1,2}
- Current performance-based functional cognition assessments exist, but many are considered too complex to be used without significant training and too lengthy to be used as screening measures in acute and post-acute care settings³
- The Mini-Cog, Medication Transfer Screen-Revised, and the Medi-Cog are three brief assessments that are used to screen individuals for cognitive impairment and medication adherence^{4,5}. Functional cognition screens have potential to identify individuals who would benefit from further evaluation to identify functional cognitive deficits that would impact discharge recommendations

Purpose: The purpose of the current study was to evaluate the sensitivity and specificity of three brief screening measures in their ability to identify impairment on a performance-based IADL task. We also examined the discriminant validity of each of these three measures by comparing the scores of individuals classified as unimpaired or impaired on the screening measures to a series of cognitive measures and a self-report measure of ADL/IADL independence

Research Design Methods

Design and Participants

- Cross-sectional observational sample of 185 participants over the age 55 living independently in the community (see Table 1)

Measures

- Brief Interview of Mental Status (BIMS)
- Trails Making Test A (TMT A)
- Trails Making Test B (TMT B)
- Montreal Cognitive Assessment (MoCA)
- Mini-Cog
- Medication Transfer Screen-Revised (MTS-Revised)
- Medi-Cog (Mini-Cog + MTS-Revised)
- Performance Assessment of Self-Care Skills (PASS)
- Alzheimer's Disease Cooperative Study Activities of Daily Living (ADCS)

Procedures and Analysis

- Descriptive statistics and frequency distributions (see Table 1)
- A receiver operating characteristic (ROC) curve analysis was used to determine the area under the curve (AUC) for the three screening measures using the combined number of cues needed on the PASS shopping and checkbook balancing tasks (PSCT) (see Table 2)
- "Impaired" and "Unimpaired" groups were established using criterion scores and ROC curve analysis of the measures, the groups were compared using student's independent t tests (see Table 3 and Figure 1)

Results

Table 1. Participant Demographic Information and Assessment Scores

	Mean (SD)	Range
Age	70.68 (8.30)	55-93
Number of Chronic Health Conditions	1.21 (1.30)	0-7
Education (years)	15.17 (3.01)	8-27
BIMS	14.56 (.90)	11-15
TMT A	44.04 (24.05)	19.66-247.23
TMT B	124 (88.15)	29.40-651.79
MoCA	23.90 (3.70)	14-30
Mini-Cog	3.99 (1.24)	0-5
MTS-Revised	4.02 (1.09)	1-5
Medi-Cog	8.01 (1.84)	3-10
PSCT Number of Cues	10.34 (9.73)	0-48
ADCS	74.88 (4.68)	42-78
	N (%)	
Female	141 (72.7%)	
White	148 (76.3%)	

Table 2. ROC Summary Using PSCT # Cues As Index Measure

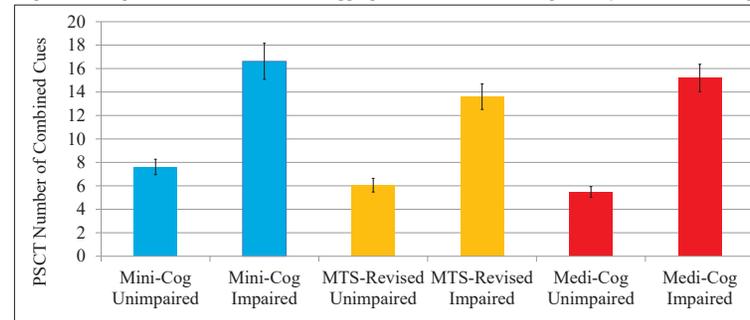
Test, (cutoff)	AUC	Sensitivity	Specificity
Mini-Cog (4)	.75	.41	.91
MTS-Revised (4)	.73	.33	.91
MTS-Revised (5)	.73	.60	.73
Medi-Cog (8)	.82	.51	.90
Medi-Cog (9)	.82	.71	.78

*Below cutoff point is defined as impairment

Table 3. Medi-Cog Status: Student's Independent Groups t Tests

	Medi-Cog Unimpaired (n=91) Mean (SD)	Medi-Cog Impaired (n=94) Mean (SD)	t(1,183); p =
BIMS	14.73 (.76)	14.39 (.99)	2.56; p < .05
Trails A	36.06 (11.80)	51.78 (29.78)	-4.69; p < .001
Trails B	86.36 (32.77)	160.45 (107.73)	-6.28; p < .001
MoCA	26.03 (2.56)	21.83 (3.46)	9.37; p < .001
PSCT # of Cues	5.48 (4.38)	15.19 (11.12)	-7.75; p < .001
ADCS	76.14 (2.36)	73.65 (5.90)	3.75; p < .001

Figure 1. Average Number of Cues on PASS Shopping and Checkbook Balancing Tasks by Measure and Group



Conclusions

- Predictive Validity: The Medi-Cog demonstrated the highest AUC statistic (.82) using the PASS shopping and checkbook balancing tasks combined number of cues as an index measure
- A cutoff score of 9 on the Medi-Cog provided the overall best combination of sensitivity and specificity for detecting impairment on the PSCT combined number of cues as an index measure
- All three screens demonstrated discriminative validity, represented by significant differences between unimpaired and impaired groups of the screens on cognitive measures and a self-report ADL/IADL scale
- The Medi-Cog may more accurately identify individuals at risk for functional cognitive impairment than the Mini-Cog or the Medication Transfer Screen-Revised alone

Implications for Practice

- The Medi-Cog (Mini-Cog + Medication Transfer Screen-Revised) may be an effective screen to identify individuals at risk for functional cognition impairment, and further research is warranted to validate these results in an acute setting
- The ability to easily identify individuals who require comprehensive evaluation will allow for appropriate referrals, interventions, and better discharge recommendations
- A more accurate identification of individuals with functional cognitive impairment may ultimately reduce unnecessary spending associated with hospital readmission and optimize patient outcomes

Acknowledgments

We would like to thank the graduate students who participated in data collection: Nellie Bubb, Hayley Engel, Erika Hoffman, Lora Johnson, Shela Ma, Courtney Smith, Brittany Nguyen, and Carl Oliver. We would like to thank the community members who volunteered to participate in this research. Support for this project was provided through the Gertrude Gaston Fund.

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