

Primary Data Collection of Cognitive Impairment

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CLIN-STAR WEBINAR



ABC Guide to ADRD Research

June 7, 2022
4-5pm ET (1-2pm PT)



Organized in
partnership with the
Clin-STAR Academic
Resource Center at
UCSF.



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Disclosures

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- No Financial disclosures

Outline

Primary Data Collection of Cognitive Function: In the context of my research

- Pros
- Cons
- Outcomes
- Challenges
- Lessons Learned
- Future Directions

How I Fit

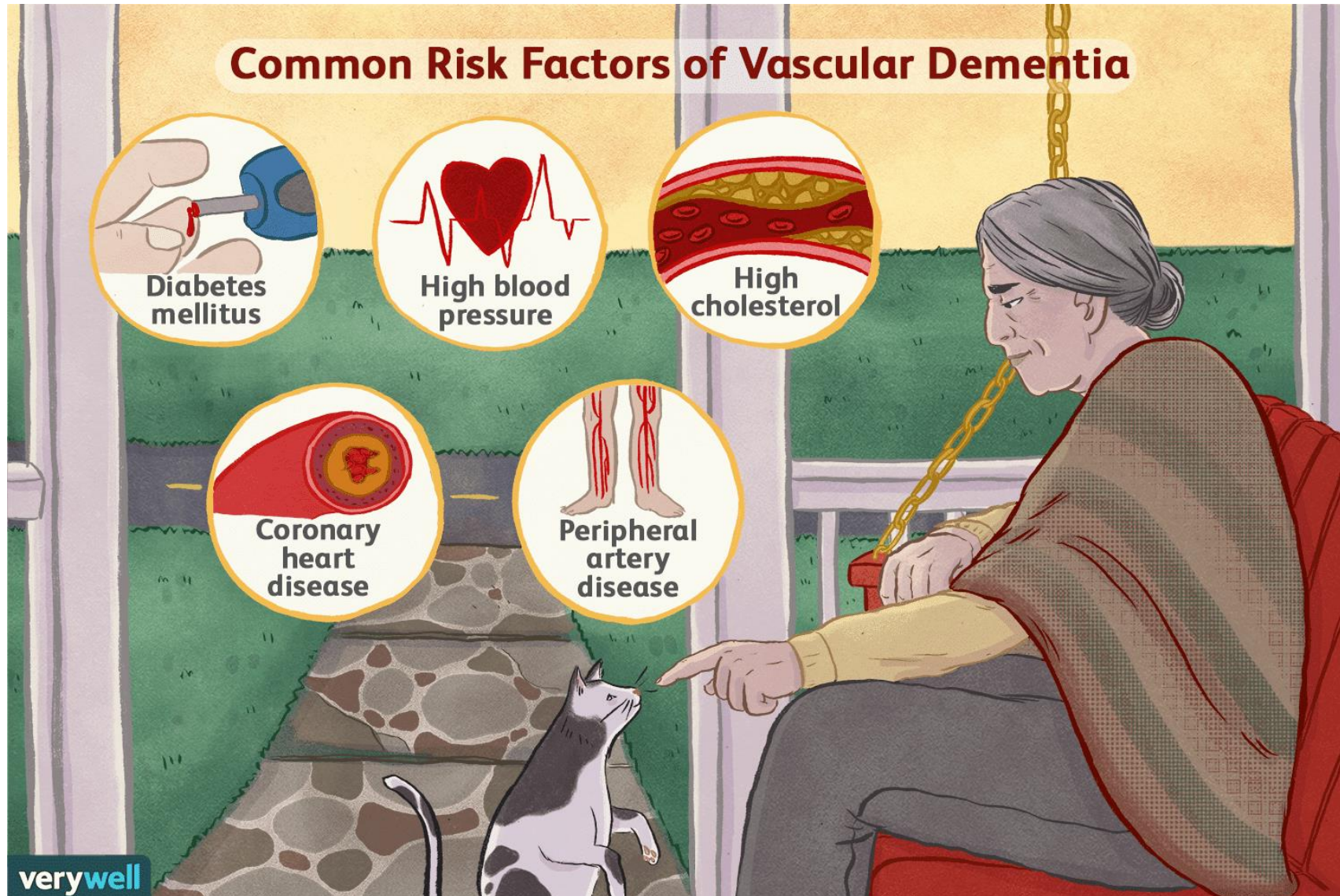
- Vascular Surgeon
- Health Services Researcher
 - Co-Director, Collaborative for Surgical Health Outcomes & Research in Equity
(**C-SHORE**)
- Age Friendly Health System
 - Vascular Surgery Outpatient Clinic Participant
- Geriatric Surgical Verification
 - Standards and Verification Committee Member



Vascular Patients are Complex

Overall Ranking	NSQIP 2017									
	Preoperative			Intraoperative			Postoperative			
	ASA class \geq 4	Major Comorbidities	Emergent Operation	Concurrent Procedure	Additional Procedure	Length of Hospital Stay	Non-Home Discharge	Readmission	Major Complication	Mortality
1. Cardiac	Cardiac	Vascular	General	Plastics	Plastics	Cardiac	Orthopedic	Vascular	Cardiac	Cardiac
2. Vascular	Vascular	Cardiac	Cardiac	General	Thoracic	Thoracic	Vascular	Cardiac	Vascular	Vascular
3. Thoracic	Thoracic	Thoracic	Vascular	ENT	Neurologic	Vascular	Neurologic	Thoracic	Thoracic	Thoracic
4. Neurologic	Neurologic	Urology	Orthopedic	Thoracic	Cardiac	Neurologic	Cardiac	Urology	Neurologic	Neurologic
5. General	General	Neurologic	Neurologic	Urology	Vascular	General	Thoracic	Neurologic	General	General
6. Urology	Urology	General	Thoracic	Neurologic	General	Orthopedic	General	General	Urology	Orthopedic
7. Orthopedic	Orthopedic	Orthopedic	Urology	Cardiac	Urology	Urology	Urology	Orthopedic	Orthopedic	Urology
8. ENT	ENT	ENT	ENT	Vascular	ENT	Plastics	Plastics	Plastics	Plastics	ENT
9. Plastics	Plastics	Plastics	Plastics	Orthopedic	Orthopedic	ENT	ENT	ENT	ENT	Plastics

PAD is a Risk Factor for Vascular Dementia



Research Objective

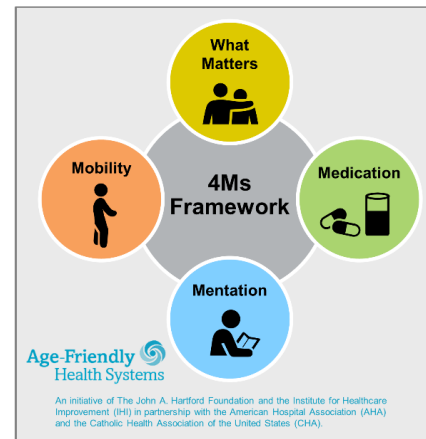
- Estimate prevalence of **Cognitive Impairment (CI)**
- Identify **CI** risk factors in patients with PAD
- Is **CI** associated with **worsening clinical status**?

Need Primary Data Collection!

- No **CI** data in surgical registries
 - NSQIP, VQI
- Large administrative datasets
 - ADRD – often not coded
 - Mild cognitive impairment often unrecognized
- Few prior studies

Choosing a Test

- Sensitivity
- Domains
- Time Required
- Acceptability
 - Subjects
 - Staff
 - Reviewers
- Generalizability



Cognitive Tests	Age Friendly Health System	Geriatric Surgical Verification System
Mini-COG	Mini-COG	Mini-COG
MoCA	MoCA	
SLUMS	SLUMS	
MMSE		
NIH Toolbox – Cognition Battery		
7M		
3M		
SAGE at Home		

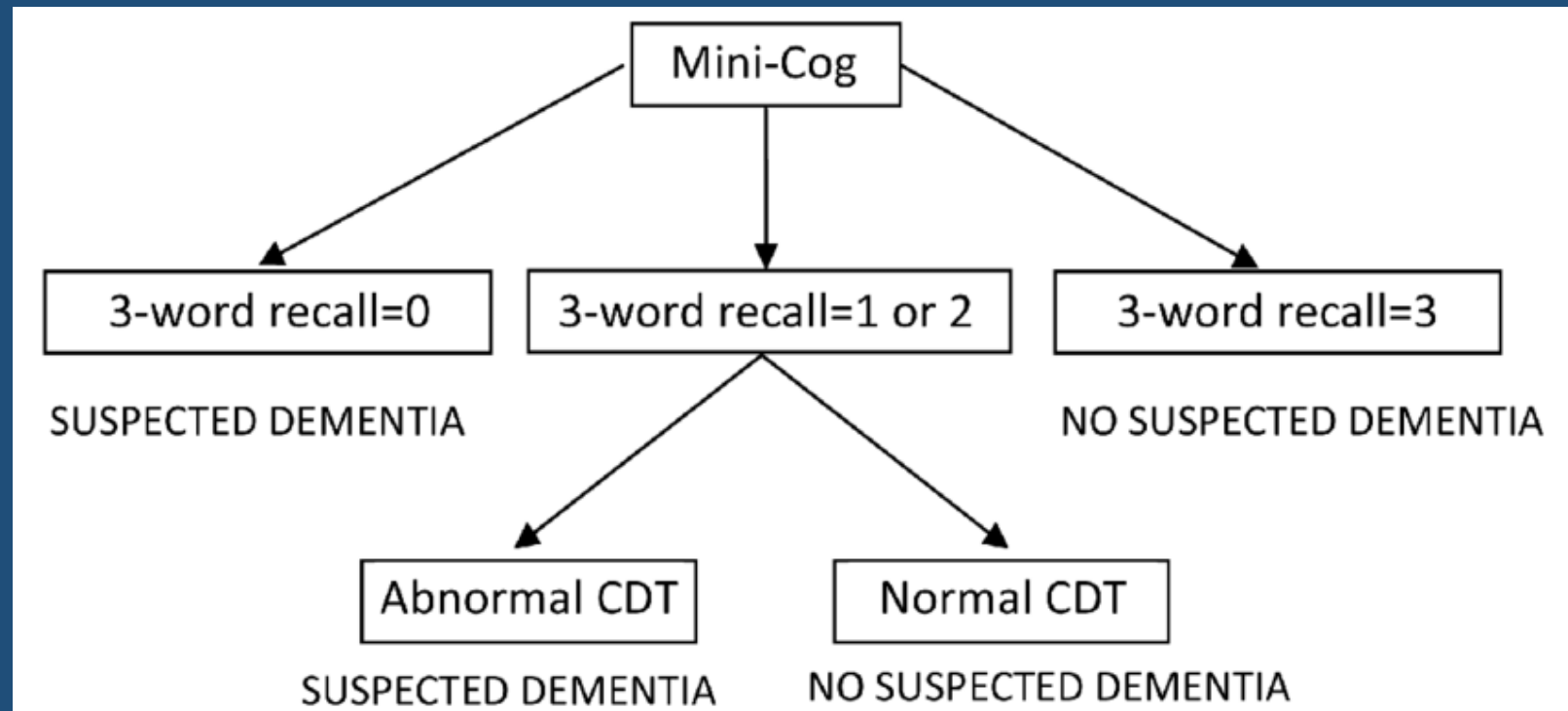
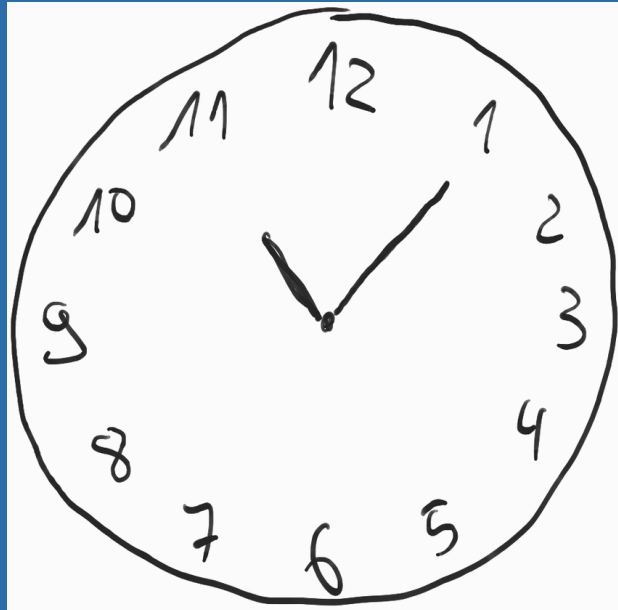
CI in Veterans with PAD Study Design

**Single Level 1a VA
Outpatient Clinic**

Inclusion Criteria

- PAD surveillance
- 7/2020- 1/19/2022

Mini COG in PAD



- N = 32
- 3 (9%) screened positive
- 23 (72%) < 5 points
- Duration 1:46 minutes

- Efficient
- Acceptable
- missing mild cognitive impairment

Montreal Cognitive Assessment

Validated Cognitive Impairment Screen

- **Domains**

- Visuospatial/Executive, Abstraction
- Naming, Repetition, Fluency
- Memory
- Attention

- **Mild Cognitive Impairment**

- MOCA Score 18-25

- **Certified Tester**

- **Telephone Version**

MONTREAL COGNITIVE ASSESSMENT (MOCA)

NAME : _____ Education : _____ Date of birth : _____
 Sex : _____ DATE : _____

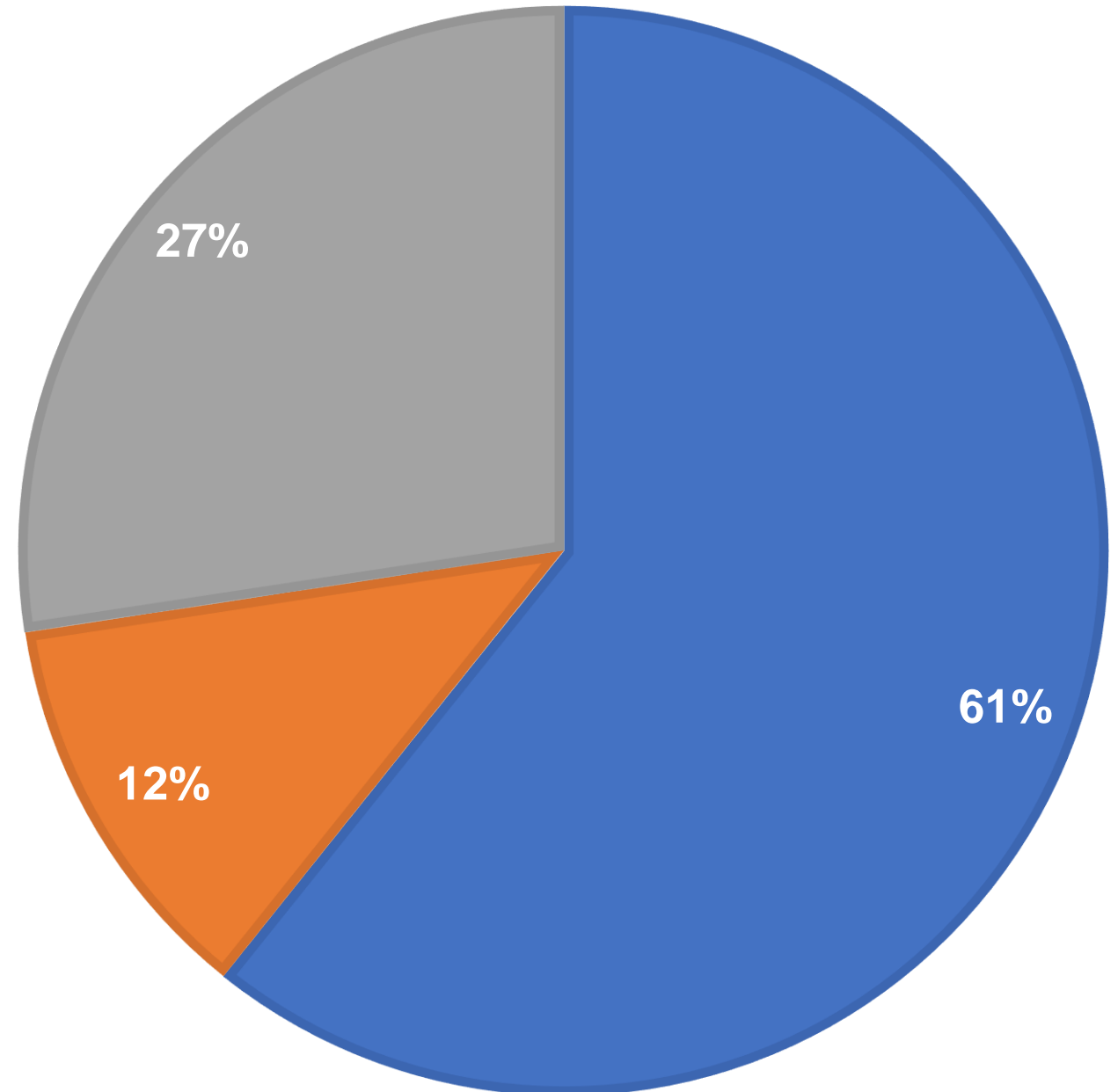
VISUOSPATIAL / EXECUTIVE		Copy cube		Draw CLOCK (Ten past eleven) (3 points)		POINTS	
				<input type="checkbox"/> Contour <input type="checkbox"/> Numbers <input type="checkbox"/> Hands			___/5
NAMING							
						___/3	
MEMORY							
Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.		FACE	VELVET	CHURCH	DAISY	RED	No points
1st trial							
2nd trial							
ATTENTION							
Read list of digits (1 digit/ sec).		Subject has to repeat them in the forward order		[] 2 1 8 5 4		___/2	
		Subject has to repeat them in the backward order		[] 7 4 2			
Read list of letters. The subject must tap with his hand at each letter A. No points if ≥ 2 errors		[] F B A C M N A A J K L B A F A K D E A A A J A M O F A A B					___/1
Serial 7 subtraction starting at 100		[] 93	[] 86	[] 79	[] 72	[] 65	___/3
		4 or 5 correct subtractions: 3 pts, 2 or 3 correct: 2 pts, 1 correct: 1 pt, 0 correct: 0 pt					
LANGUAGE							
Repeat : I only know that John is the one to help today. []		The cat always hid under the couch when dogs were in the room. []					___/2
Fluency / Name maximum number of words in one minute that begin with the letter F		[] ____ (N ≥ 11 words)					___/1
ABSTRACTION							
Similarity between e.g. banana - orange = fruit		[]	train - bicycle	[]	watch - ruler	___/2	
DELAYED RECALL							
Has to recall words WITH NO CUE		FACE	VELVET	CHURCH	DAISY	RED	Points for UNCUED recall only
Category cue		[]	[]	[]	[]	[]	
Optional Multiple choice cue							
ORIENTATION							
[] Date		[] Month	[] Year	[] Day	[] Place	[] City	___/6
© Z.Nasreddine MD Version November 7, 2004 Normal ≥ 26 / 30							
www.mocatest.org						TOTAL	___/30
Add 1 point if ≤ 12 yr edu							

MoCA

9/1/2020-8/31/2021

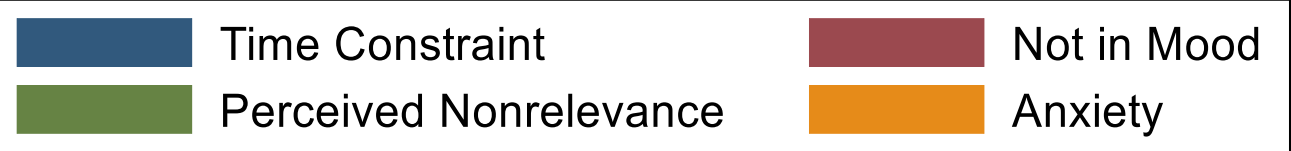
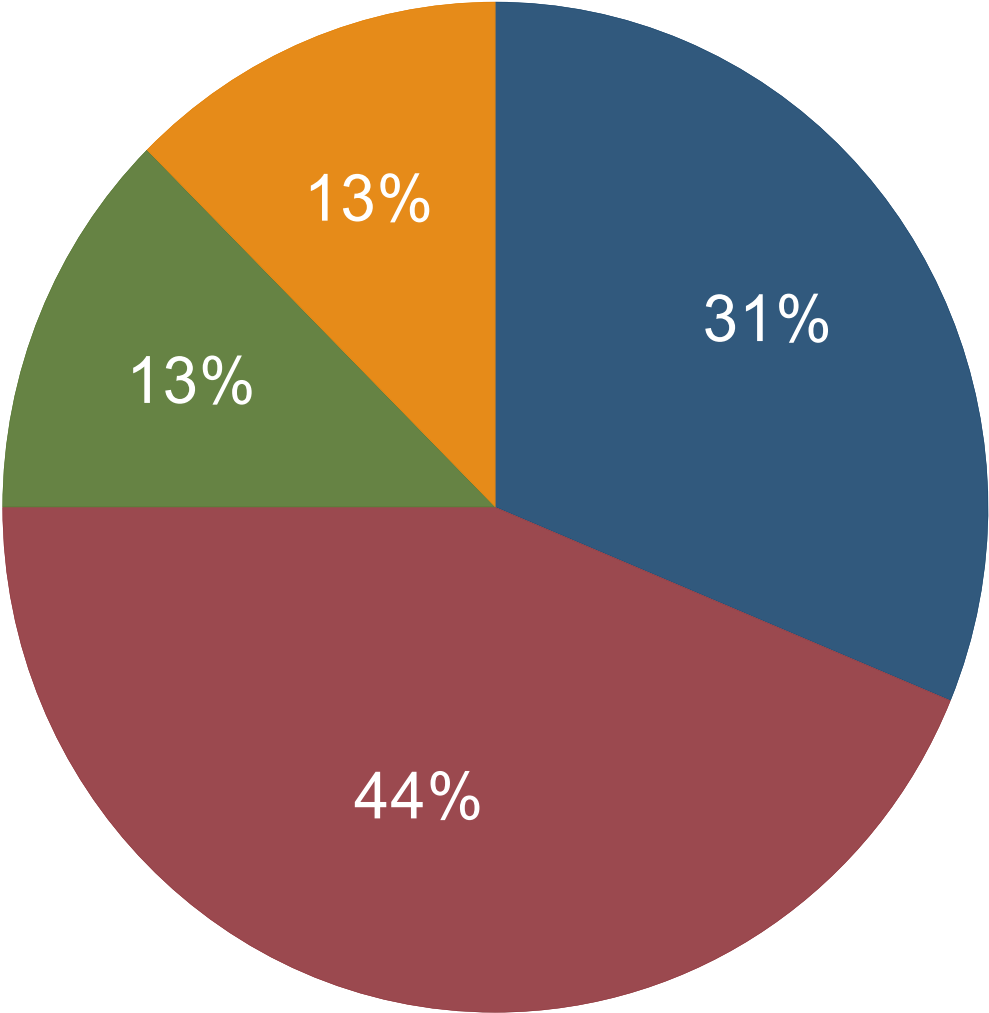
- 135 met eligibility criteria
 - 82 screened
 - 37 Incomplete/left prior to screen
 - 16 refused

■ Screened ■ Refused ■ Incomplete



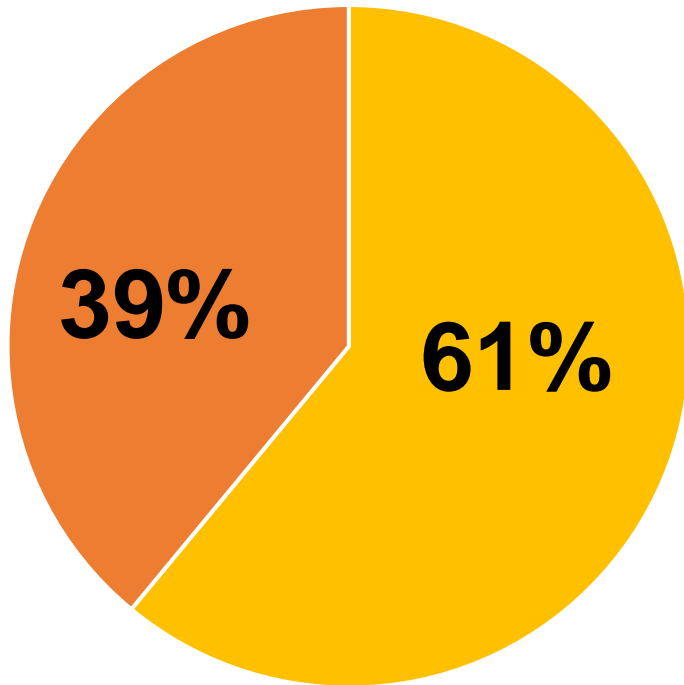
Declined Participation Reasons

N=16



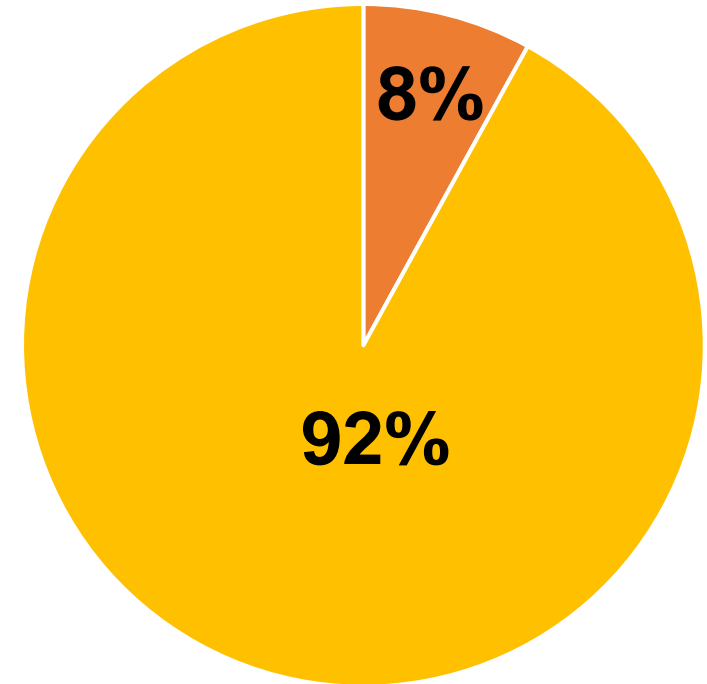
Majority with “New” Cognitive Impairment

n=125



■ CI ■ No CI

n=77



■ History ■ New Diagnosis

Duration 12:09 (7:28-20:35) minutes

What to do with Positive Results

- MoCA is a screening test **only**
- Counselling by Clinician
- Notification to Primary Care Physician
- Referral to Geriatrician
- Further Neuropsychiatric testing may be indicated

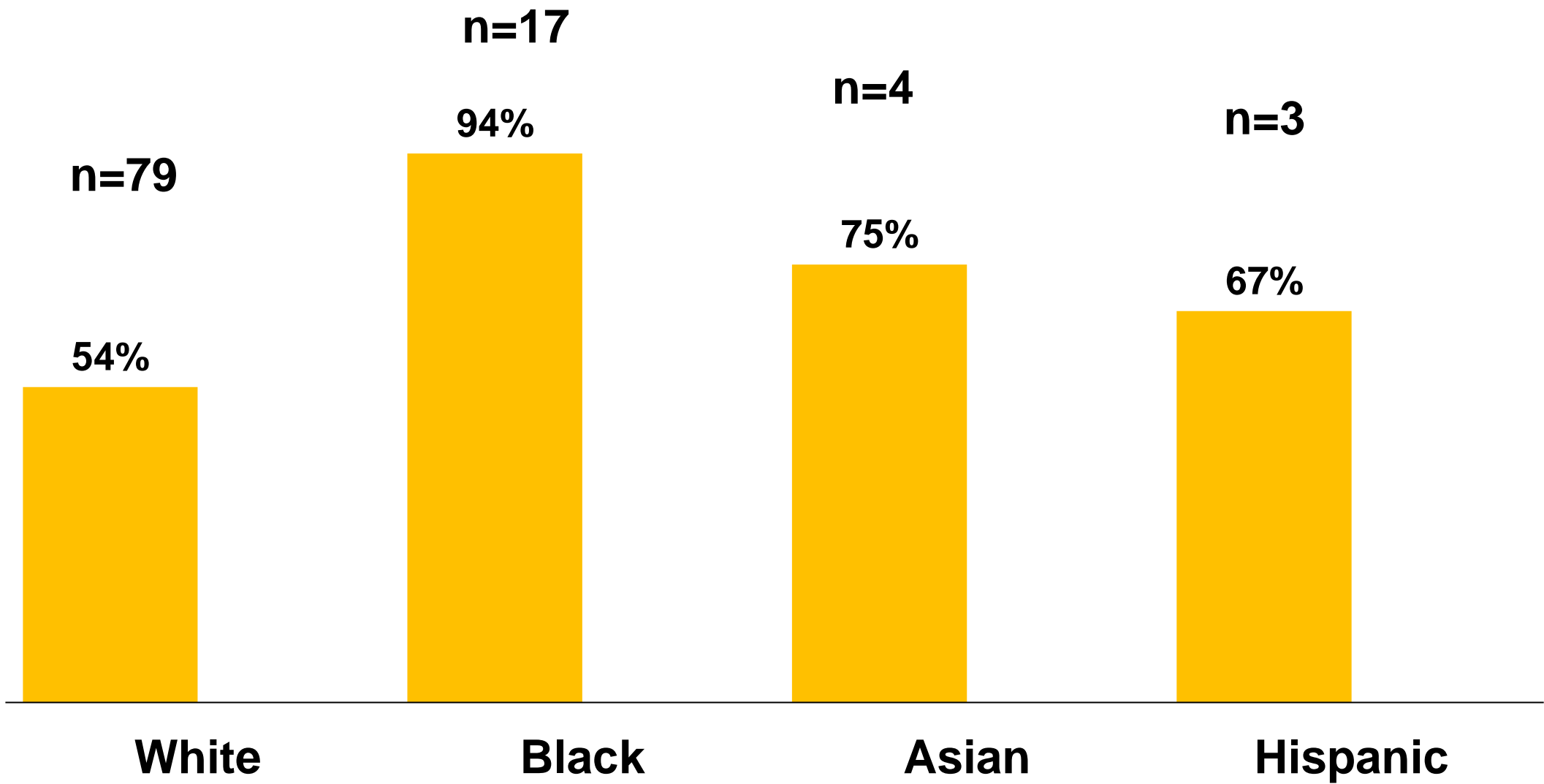
Baseline Characteristics

Covariate	Total n=125	CI n=77	No CI n=48	p-value
Age (years)	73.4 ± 6.7	74.4 ± 6.3	71.8 ± 7.1	0.03
Hypertension	109 (87)	72 (66)	37 (34)	<0.01
Coronary Artery Disease	50 (40)	28 (56)	49 (44)	0.29
Prior PCI/CABG	33 (26)	21 (64)	12 (36)	0.78
Insulin-Dependent Diabetes Mellitus	25 (20)	19 (76)	6 (24)	0.10
Chronic Kidney Disease	34 (27)	25 (74)	9 (26)	0.10
Prior Stroke/TIA	19 (15)	15 (79)	4 (21)	0.10
Post-Traumatic Stress Disorder	25 (20)	20 (80)	5 (20)	0.03
Depression	36 (29)	25 (69)	11 (31)	0.25

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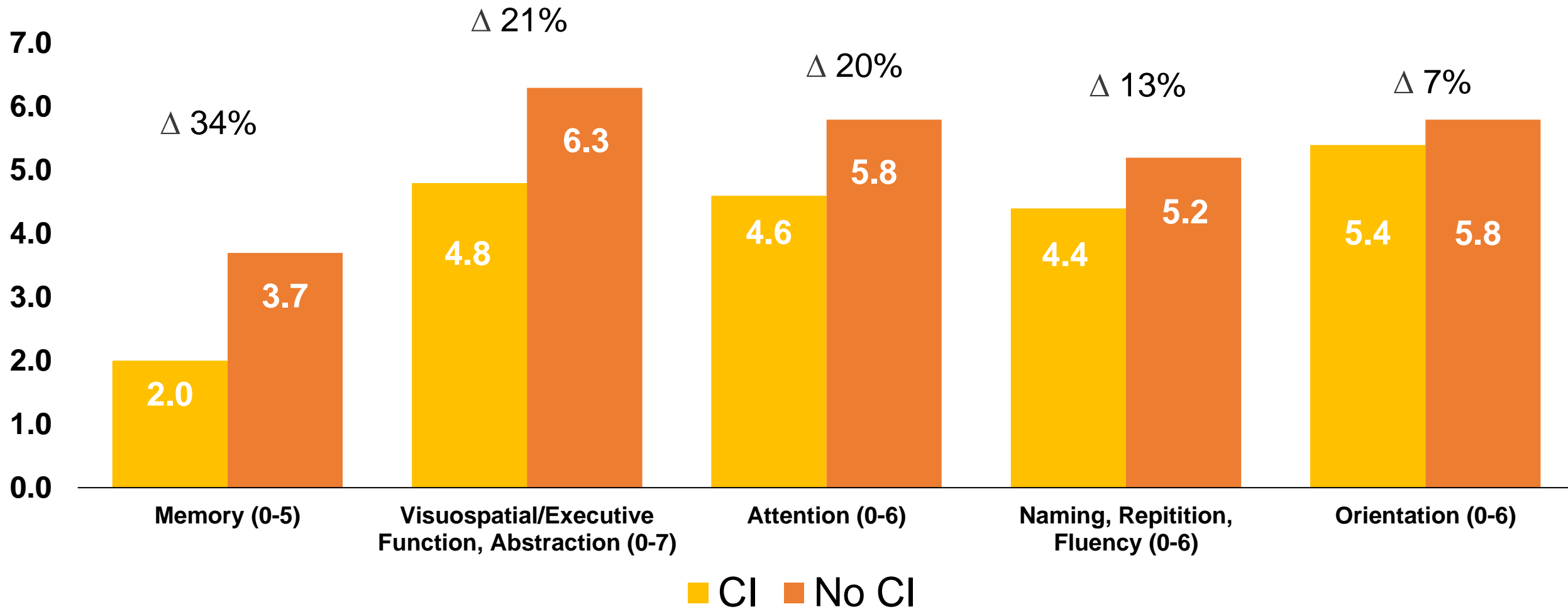
Race & Ethnicity by Cognitive Impairment *



* p-value <0.01

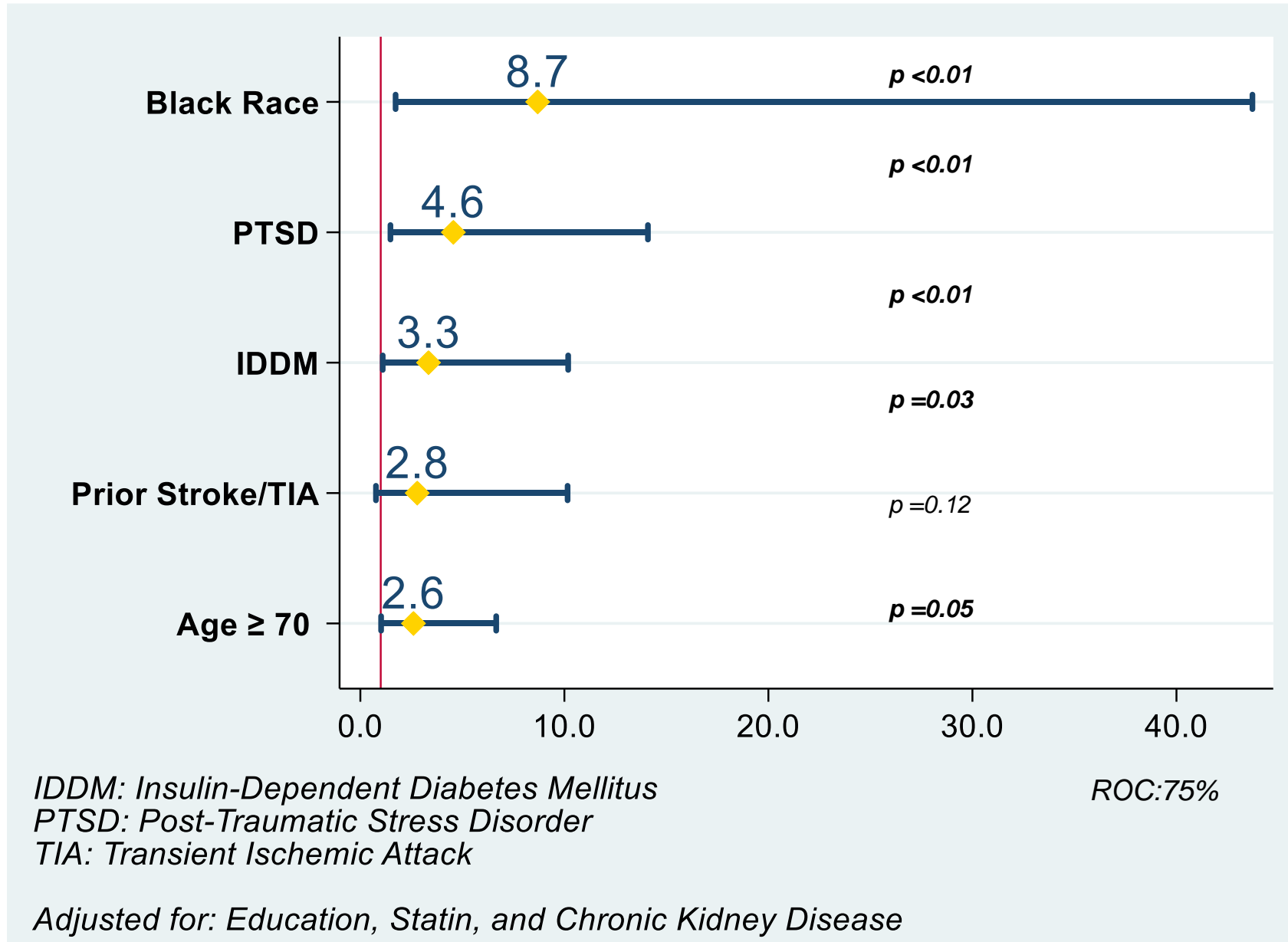
■ CI

MOCA Domains by CI Status



* p -value < 0.01 for each domain

Multivariable Logistic Regression: Unrecognized CI



CI Associated with Worsening Clinical Status

Revascularization within 3 months, new or non-healing wound

Covariate	Total n=125	CI n=77	No CI n=48	p-value
Asymptomatic	15 (12)	10 (12)	5 (10)	
Improvement	6 (5)	1 (1)	5 (10)	
Stable	39 (31)	19 (25)	20 (42)	
Worsening	65 (52)	47 (62)	18 (38)	0.01

CI Associated with Worsening Clinical

Multivariable Logistic Regression: Worsening Clinical Status

Covariate	AOR	95%CI	p-value
Cognitive Impairment	3.7	1.5-9.5	<0.01

** Adjusted for Prior Major Amputation, Education, Statin, PTSD, Prior Stroke/TIA, IDDM, Hypertension, and Chronic Kidney Disease*

Pros

Why use Primary Data Collection?

- Opportunity
 - Poorly coded in major datasets
 - Paucity of Data
- Often unrecognized clinically
- Potential major impact on clinical outcomes
- Better understanding **CRITICAL**

Outcomes

- Cognitive function over time
- Maintaining independence
 - ADLs/IADLs
 - Living at home
- Specific clinical outcomes
 - Worsening clinical severity
 - In-Hospital Delirium
 - Medication compliance
- Surgical Outcomes
 - Major Cardiac Events
 - Urinary Tract Infections,
 - Inpatient Falls,
 - Readmission,
 - Nursing home discharge
 - LOS

Cons of Primary Data Collection

- Many different instruments
- Little consensus on which to use
- Often time intensive
- Shifting definitions of subtypes
- Generalizability/population dependent
- Lack of evidence on how to incorporate into decision making
- Perceived potential harm of routine screening

Challenges

- Getting Started
 - IRB bottleneck
 - In-person screening
- Time required to perform evaluation
 - Workflow
 - Balancing sensitivity and specificity
- Addressing positive screens
- Incorporating into care
- Caregiver Inclusion
- Repeated measures – practice effects

Lessons Learned

- Addresses a Major Gap
- Addressing workflow
 - Routine
 - Separate Room
 - Trained screener
- Continual Reassessment of Process

Future Directions

- Tablet based assessments
 - TabCAT
 - NIH examiner
- Short and long-term outcomes after Vascular Surgery
- PrehabPal
 - Self Assessment
 - Linked to directed approaches

The Team, The Team, The Team!

Fundamentally Multidisciplinary

- Louise Walter, MD
- Ken Covinsky, MD
- Emily Finlayson, MD
- Michael Conte, MD
- Katherine Possin, PhD
- Rebecca Sudore, MD
- Deborah Barnes, PhD
- Eric Smith, MS
- Ricky Gutierrez
- Anne Fabiny, MD
- Team Mentorship
- Research Team
- Clinical Collaboration
- Clinical and Research Team Coordination