

5-Cog Paradigm

- Joe Verghese, MBBS, MS
- Albert Einstein College of Medicine, Bronx, NY
- Renaissance School of Medicine
Stony Brook University, NY
- Joe.verghese@einsteinmed.edu
- NAPA Advisory council 2024

1

DetectCID is a collaborative research effort directed and funded by the National Institute of Neurological Disorders and Stroke (NINDS) and the National Institute on Aging (NIA), components of the National Institutes of Health (NIH).



- Albert Einstein College of Medicine, Bronx, NY
- UCSF, San Francisco, CA
- Northwestern University, Chicago, IL


U01NS105565, NINDS (2018-2023). PO: Rebecca Hommer, Scientific: Roderick Corriveau

2

AIMS: 5-Cog 1.0


(2019-2023)

Test the ability of the 5-Cog paradigm (cognitive battery and decision tree) to improve dementia care in older primary care patients with cognitive concerns.



- Silver tsunami with higher cognitive impairment burden
- Higher cognitive concern awareness
- Primary care - frontline of dementia diagnosis and care
- Medicare Annual Wellness visit
- New diagnostics
- New therapeutics

3



nature medicine

Article <https://doi.org/10.1038/s41591-024-03012-8>


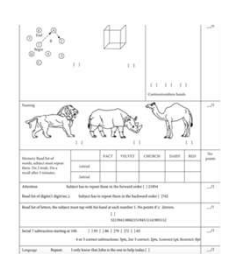
Non-literacy biased, culturally fair cognitive detection tool in primary care patients with cognitive concerns: a randomized controlled trial

Received: 20 November 2023 Joe Vergese^{1,2}, Rachel Chalmer², Marnina Stimmel¹, Erica Weiss¹,
 Accepted: 22 April 2024 Jessica Zwerling¹, Rubina Malik², David Rasekh², Asif Ansari^{2,3},
 Published online: 04 June 2024 Roderick A. Corriveau⁴, Amy R. Ehrlich⁵, Culling Wang^{3,4} & Emmeline Ayers¹

- Dementia is often undiagnosed in primary care.
- Black and Hispanic patients have missed or delayed diagnosis of dementia more often compared to Whites.
- Barriers to implementing routine cognitive detection and related care in primary care are at the level of the instrument, patient, clinician, and healthcare system.
- Many tests developed in White populations, and do not adequately account for cultural differences or health inequity.


4

- **5-Cog paradigm =
5-Cog Battery + 5-Cog recommendations**
- **5-Cog is not the best test ever!**
- **Goal is to improve dementia care**

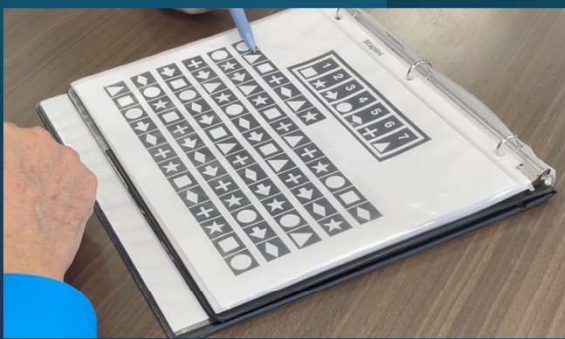



5

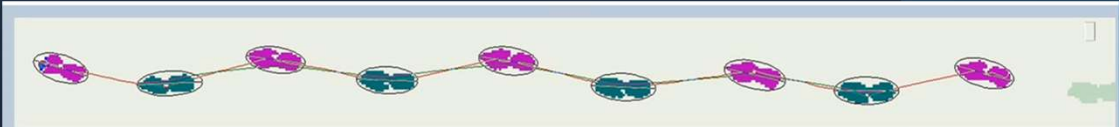
The 5-Cog battery: 3 tests in 5 minutes. Cutscores selected by PCPs



**Picture-based Memory Impairment Screen:
PMIS**

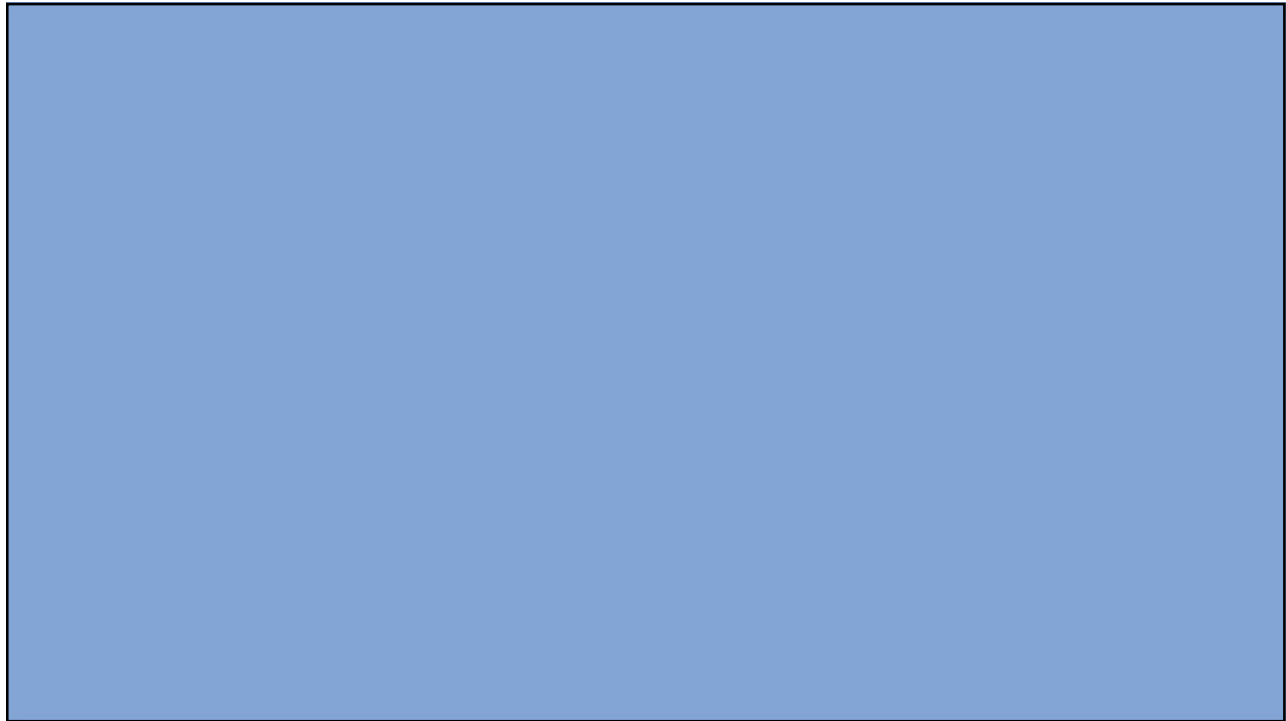


Symbol match



Timed walk: Motoric Cognitive Risk syndrome


6



7

The 5-Cog Paradigm:

Brief Cognitive Assessment
+
Clinical Decision Support



Montefiore Einstein

8

Thank you!

- Mairim Melecio-Vazquez
- Leslie Torres Castro
- Gabriela Carmona
- Diana Gomez
- Pratibha Yadav
- Rachel Chalmer
- Emmeline Ayers

9

Target population

Adults aged 65 and older presenting with cognitive concerns to primary care clinics

Single primary care clinic in Bronx

<p>What does the USPSTF recommend?</p>	<p>For asymptomatic, community-dwelling adults age 65 years and older: <u>I statement</u> The USPSTF found that the evidence is insufficient to assess the balance of benefits and harms of screening for cognitive impairment in older adults. More research is needed.</p>
--	---

USPTF. JAMA 2020


10

Albert Einstein College of Medicine
Departments of Medicine and
Neurology
Integrated Division of Geriatrics and
Cognitive and Motor Aging

EINSTEIN
Albert Einstein College of Medicine

National Institutes of Health
National Institute of Neurological
Disorders and Stroke
National Institute on Aging
Detect CID Consortium

You may be eligible to participate in a research study
on memory.




- Are you concerned about your memory?
Yes [] No [] *Sometimes*
- Are your loved ones concerned about your memory?
Yes [] No [x]

Give this flyer to your nurse.
If you qualify to participate in the research study, the research coordinator will speak with you before your visit with your doctor. The study interview will be completed at your visit today and will last about 65 minutes.
You will receive 20 dollars if you complete the study.

5-Cog battery to improve detection of cognitive impairment and dementia
Principal Investigator: Joe Verghese, MBBCh, MS
Telephone #: 718-430-3808

Albert Einstein College of Medicine
1225 Morris Park Avenue
Van Etten, Room 308
Bronx, NY 10461




Covid 2020

Enrollment and consent


11


Block randomize – patient not PCP


	5-COG	CONTROL
Tests	PMIS MCR Symbol match	Grip strength Health literacy
Outcome	Improved dementia care MCI/dementia	Frailty Health literacy
Time	5 minutes	5 minutes
Timing	Before PCP	Before PCP
Recommendations	Yes	Yes




patients with low
HEALTH LITERACY...

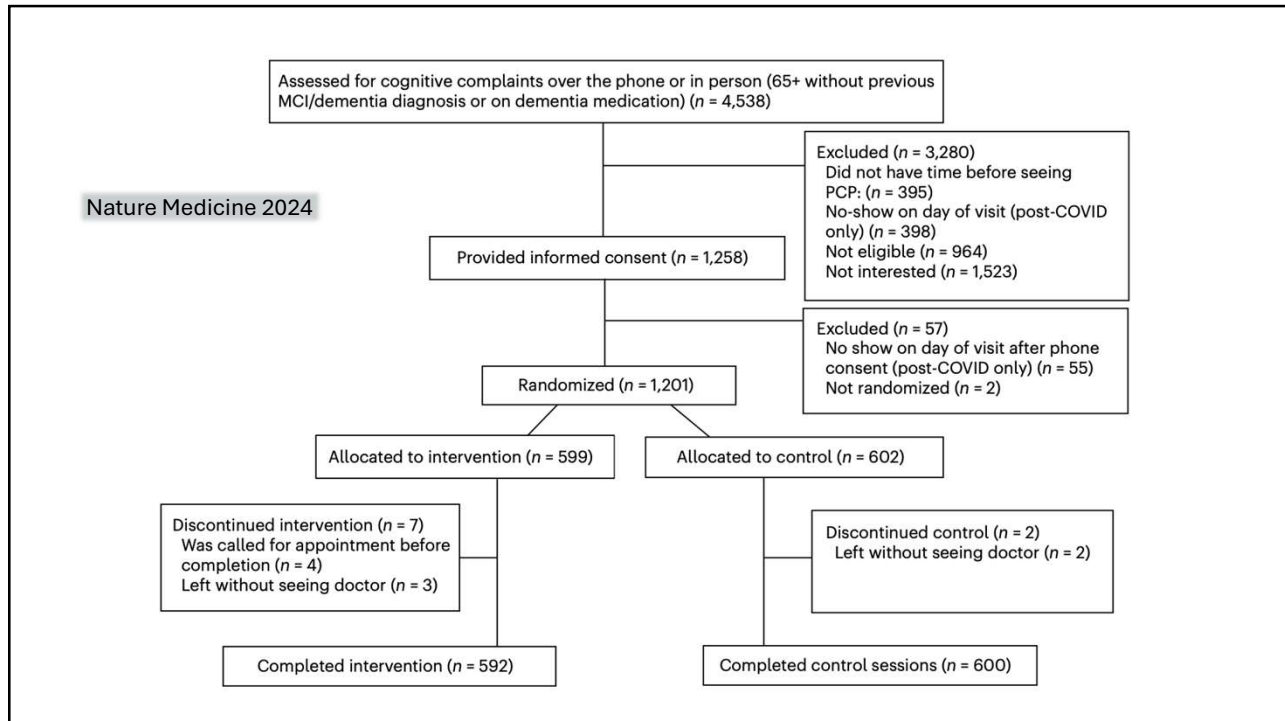

Are more
likely to visit an
**EMERGENCY
ROOM**


Have more
**HOSPITAL
STAYS**


Are less
likely to follow
**TREATMENT
PLANS**


Have higher
**MORTALITY
RATES**

12



13

Nature Medicine 2024

Variables	Intervention (N=599)	Active control (N=602)
Age, years (mean±s.d.)	72.88±6.38	72.64±6.67
Sex		
Female, n (%)	431 (72.0)	434 (72.1)
Male, n (%)	168 (28.0)	168 (27.9)
Race or ethnic group, n (%)		
Black	305 (50.9)	280 (46.5)
White	59 (9.8)	59 (9.8)
Asian	13 (2.2)	10 (1.7)
American Indian/Alaskan native	4 (0.7)	4 (0.7)
Hawaiian	2 (0.3)	1 (0.2)
More than one race	33 (5.5)	28 (4.7)
Other	29 (4.8)	38 (6.3)
Not reported/refused	154 (25.7)	182 (30.2)
Hispanic or Latino ethnic group, n (%)	323 (53.9)	344 (57.1)
Education		
Years of education, mean±s.d.	11.24±4.10	10.95±4.26
Some high school or less, n (%)	232 (38.7)	253 (42.0)
High school graduate or higher, n (%)	367 (61.3)	349 (58.0)
Socioeconomic disadvantaged neighborhood residency, n (%)	100	100
Language of test administration, n (%)		
English	339 (56.6)	342 (56.8)
Spanish	260 (43.4)	260 (43.2)

14

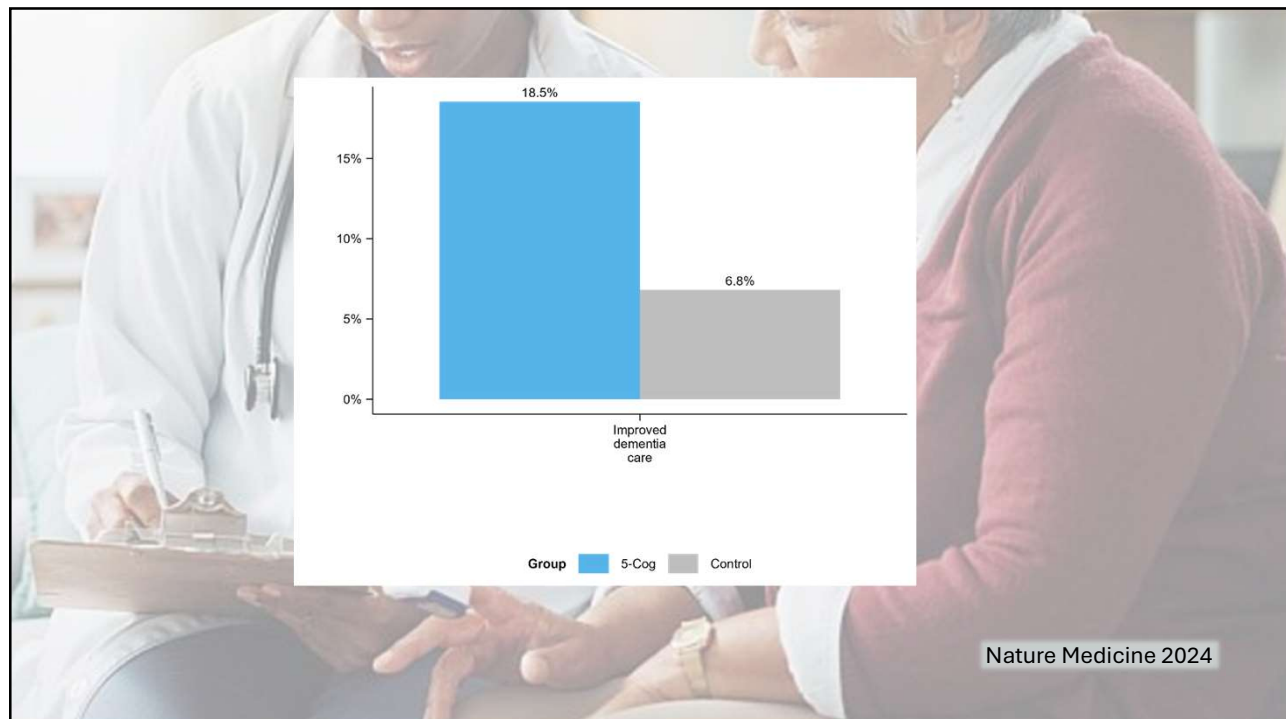
Outcomes

Primary: Improved dementia care (90 days)

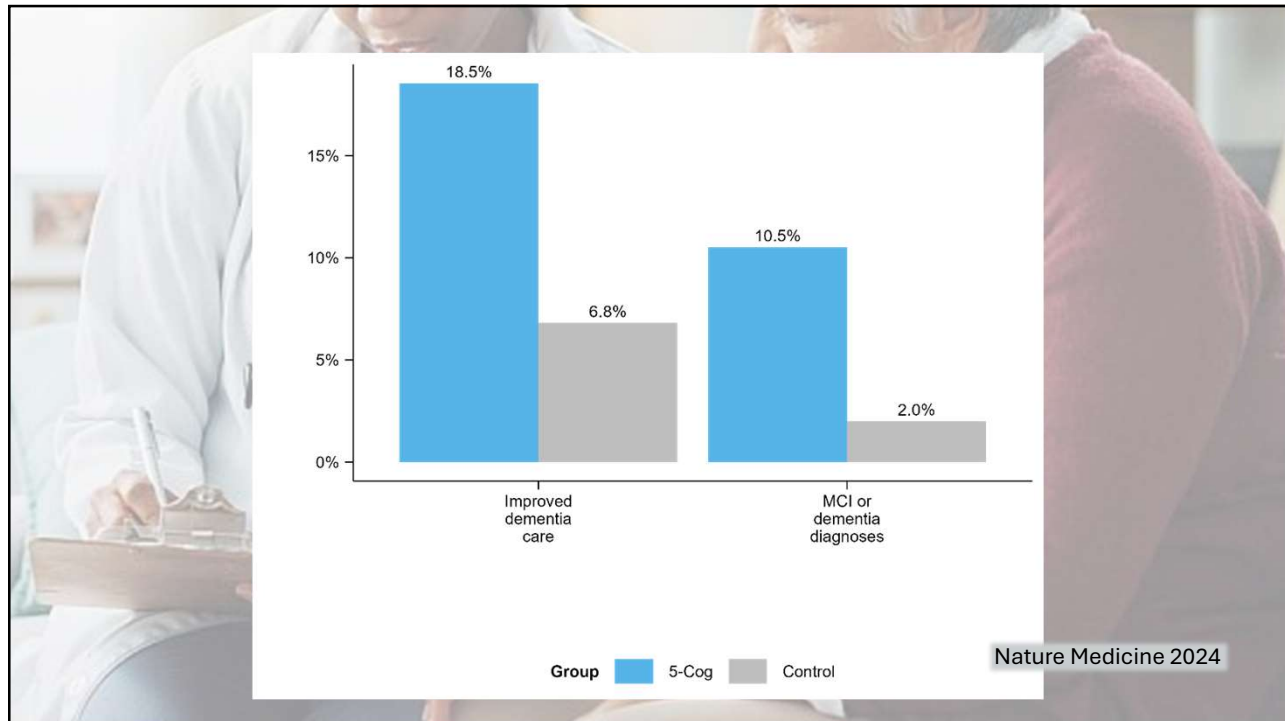
- New MCI/dementia diagnoses by PCP
- Laboratory/imaging tests (cognitive indication only)
- Specialist referral for cognitive evaluation
- New dementia medication prescriptions

Secondary: Hospitalization/ED visits for any reason 12 months

15



16

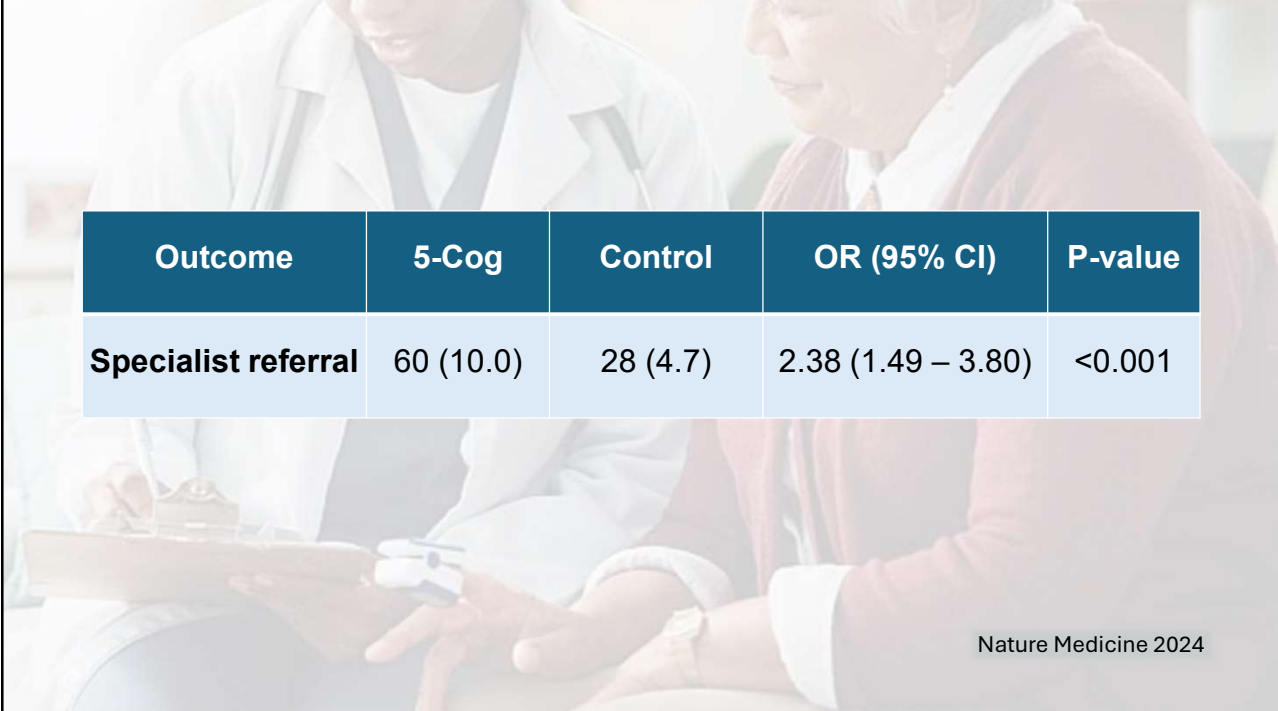


17

Outcome	5-Cog	Control	OR (95% CI)	P-value
Imaging ordered	39 (6.5)	9 (1.5)	4.80 (2.29 – 10.06)	<0.001
Tests ordered	73 (12.2)	12 (2.0)	7.64 (4.05 – 14.39)	<0.001

Nature Medicine 2024

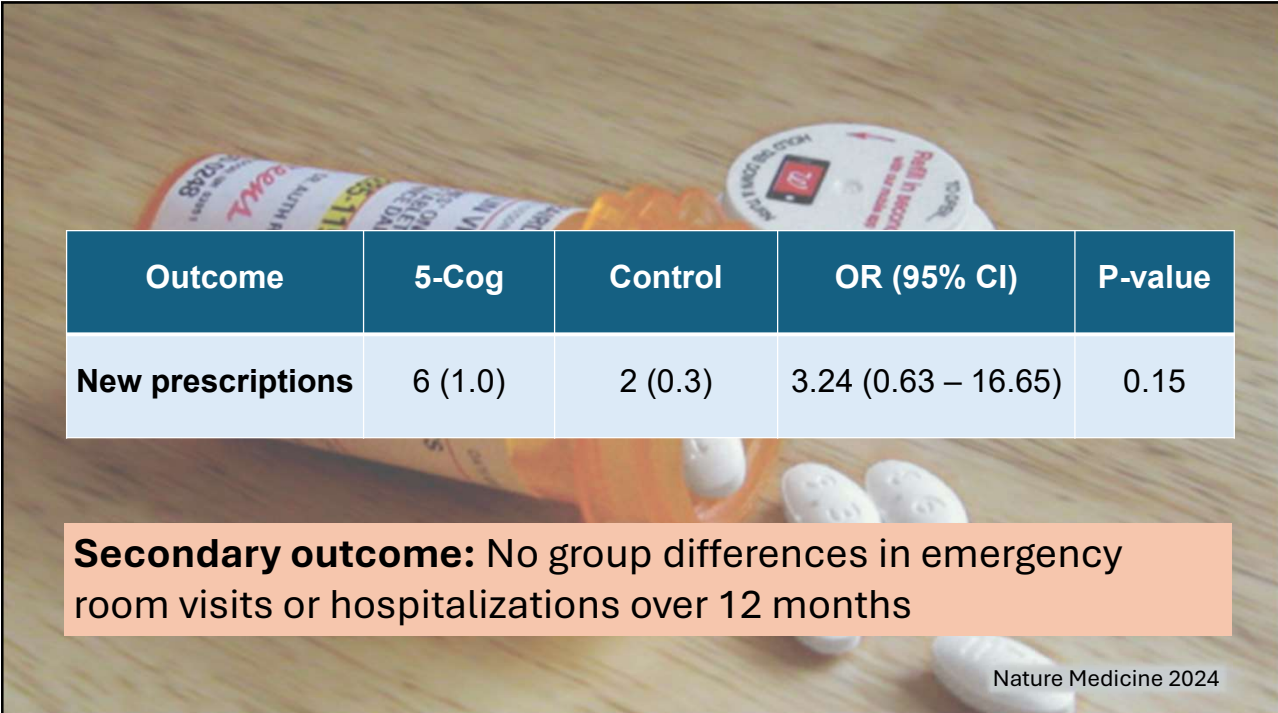
18



Outcome	5-Cog	Control	OR (95% CI)	P-value
Specialist referral	60 (10.0)	28 (4.7)	2.38 (1.49 – 3.80)	<0.001

Nature Medicine 2024

19



Outcome	5-Cog	Control	OR (95% CI)	P-value
New prescriptions	6 (1.0)	2 (0.3)	3.24 (0.63 – 16.65)	0.15

Secondary outcome: No group differences in emergency room visits or hospitalizations over 12 months

Nature Medicine 2024

20



No study related adverse events (medical symptoms or signs, anxiety, depressive symptoms, etc.).

No notes indicating possible harm were recorded by clinicians in the EMR during the 90-day observation period.

Risk factors for dementia and self-harm: A linkage study

Adrian R. Walker, Preeyaporn Srasuebkul ✉, Julian N. Trollor, Anne P. F. Wand, Brian Draper, Rachael C. Cvejic, Annette Moxey, Simone Reppermund

First published: 01 May 2023 | <https://doi.org/10.1002/alz.13080>

Highlights

- Most self-harm in people living with dementia occurs within 24 months of diagnosis.
- Men living with dementia were more likely to self-harm than women.
- People living with dementia with poor mental health are more likely to self-harm.
- Self-harm in older people may indicate undiagnosed or prodromal dementia.
- Mental health supports are needed shortly after a dementia diagnosis.

21

Strengths

- High prevalence of cognitive concerns: ~40%
- >90% racial/ethnic minorities
- 100% socioeconomically disadvantaged neighborhoods
- 40% <high school
- English and Spanish testing
- Real world primary care
- Actions relevant to patient care
- Large effect size

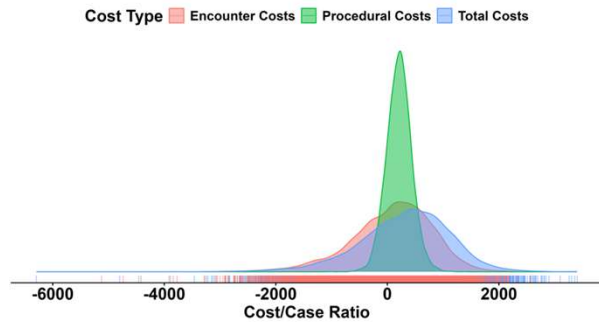
Limitations

- Covid-19 effect
- PCPs not blinded
- Diagnoses by PCPs
- Other care indicators
- Asymptomatic patients
- Single center
- Neuropsychological tests
- Implementation issues

22

Cost-Effectiveness of 5-Cog Paradigm

- Direct costs from EPIC EHR for encounter and procedural costs were aggregated based on relevance to 5-Cog decision tree.
- Bootstrapped ICERs (Cost/Case) were well under literature considered willingness-to-pay thresholds (< \$50,000)



Cost Aspect	Cost/Case Ratio for 5-Cog (95% CI)	Cost/Case Ratio for Control (95% CI)	ICER (95% CI)
Total Medical Expenditures Post Intervention	\$1988 (\$1414 – \$3052)	\$8715 (\$4464 – \$24441)	\$306 (-\$2250 – \$1419)
Total Encounter related Expenditures Post Intervention	\$1319 (\$1004 – \$1783)	\$2967 (\$418 – \$20383)	\$212 (-\$223 – \$675.2)

Unpublished: Congivaram H, Verghese J, French DD

23

5-Cog 2.0

- Pragmatic cluster randomized trial
- 5-Cog vs Usual care
- Hybrid effectiveness-implementation design
- 22 Primary care clinics: Bronx 6, Indiana 16
- 6,600 participants

Outcomes

- MCI/dementia diagnoses (primary)
- Improved dementia care (secondary)
- Implementation barriers
- Cost effectiveness



Dr. Malaz Boustani

Indiana University

5-Cog 3.0?

5U01NS105565, NINDS (2022-2027). PO: Rebecca Hommer, Scientific: Roderick Corriveau

24



Thanks to 5 Cog 1.0
and 5 Cog 2.0 teams!

Joe.verghese@einsteinmed.edu

Einstein makes the 5-Cog battery available free of cost to all researchers for academic pursuits under a simple letter agreement. However, Einstein charges a fee if there is a commercial application for the test and requires a copyright license agreement.