Trade-Offs in Cognitive Testing in Primary Care: Recruitment Matters

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Background

Most cognitive impairment (CI) goes undetected in primary care, yet there is no consensus on how cognitive testing should be initiated. The US Preventive Services Task Force has not recommended universal screening, while Medicare requires Annual Wellness Visit assessment without specifying a method. Existing literature focuses on which test to use, but choosing whom to test may be equally consequential. Health systems face trade-offs between case detection, false positives, and workforce capacity when selecting a testing strategy.

Methods

1,000 hypothetical individuals aged 70 without a prior CI diagnosis were modeled. Of these, 92 had undetected CI (MCI or dementia) and 908 were cognitively normal (MCI prevalence 7.2%, dementia 0.9%). **Testing initiation strategies were:**

Reactive: Testing is initiated in response to concerns about cognition or memory raised organically by the patient or caregiver; or based on clinician observation.

Selective: Testing is initiated based on systematic and proactive identification of elevated risk from the electronic health record.

Inclusive: Testing is offered to all 70-year-olds who do not have a pre-existing cognitive impairment diagnosis. We assume 50% participation.

Table 1. Probability of testing by cognitive status

	Reactive	Selective	Inclusive
No CI	0.5%	9%	50%
MCI	20%	80%	50%
Dementia	90%	100%	50%

TabCAT BHA Cognitive Score with -1.5z cut-off has 66% sensitivity for MCI, 96% sensitivity for dementia, and 93% specificity for any CI.

Results

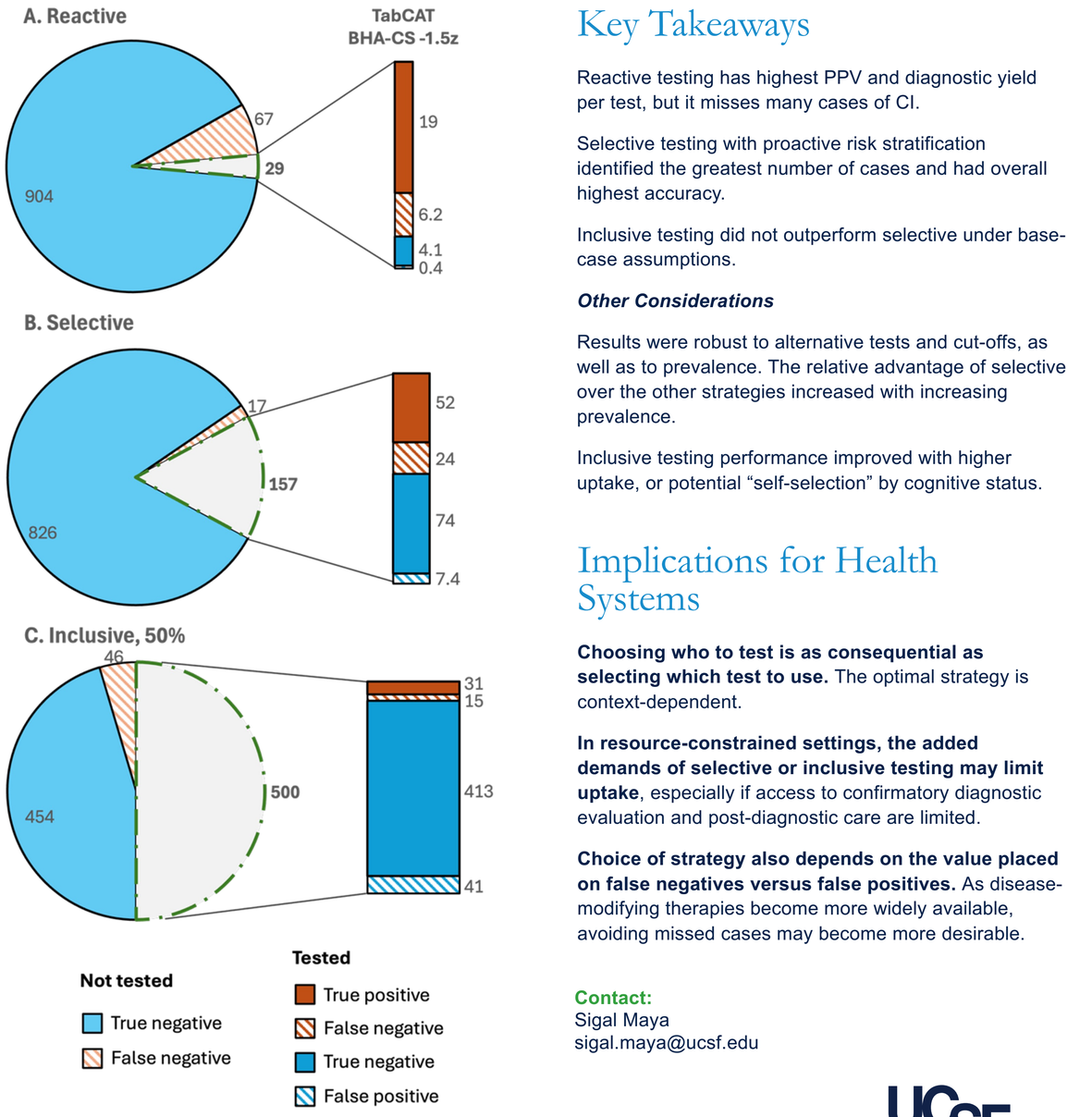
Proactive, risk-based selective testing maximizes detection of undiagnosed cognitive impairment and overall classification accuracy.

Table 2. Outcomes of testing initiation strategies

	Reactive	Selective	Inclusive
Per-test diagnostic yield	**66%**	33%	6%
% of cases identified	21%	**57%**	34%
Total accuracy	92.7%	**95.2%**	89.8%
Positive predictive value	**98%**	88%	43%
Negative predictive value	93%	**96%**	93%

Table 3. Comparative performance in identifying true positives

	TP (Δ)	FP (Δ)	ΔTP : ΔFP
Reactive	19	**0.4**	
Selective	**52** (+33)	7.4 (+7)	5 : 1
Inclusive	31 (-21)	41 (+34)	1 : 1.6



Key Takeaways

Reactive testing has highest PPV and diagnostic yield per test, but it misses many cases of CI.

Selective testing with proactive risk stratification identified the greatest number of cases and had overall highest accuracy.

Inclusive testing did not outperform selective under base-case assumptions.

Other Considerations

Results were robust to alternative tests and cut-offs, as well as to prevalence. The relative advantage of selective over the other strategies increased with increasing prevalence.

Inclusive testing performance improved with higher uptake, or potential "self-selection" by cognitive status.

Implications for Health Systems

Choosing who to test is as consequential as selecting which test to use. The optimal strategy is context-dependent.

In resource-constrained settings, the added demands of selective or inclusive testing may limit uptake, especially if access to confirmatory diagnostic evaluation and post-diagnostic care are limited.

Choice of strategy also depends on the value placed on false negatives versus false positives. As disease-modifying therapies become more widely available, avoiding missed cases may become more desirable.

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