

Advancing Detection and Treatment of Impaired Cognition in the Emergency Department

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- No other disclosures

Learning Objectives

- Understand the prevalence and care issues among patients presenting to the ED with cognitive impairment
- Evaluate current and near future ED screening methods
- Evaluate current and near future ED treatment options

Scope of the Problem: Lots of Visits

- The ED is a critical source of acute, unscheduled care for older adults
- Older adults living with dementia use the ED at twice the rate of controls
- About half of these visits result in discharge

Green RK, Shah MN, Clark LR, Batt RJ, Chin NA, Patterson BW.
Comparing emergency department use among individuals
with varying levels of cognitive impairment. *BMC Geriatr.*
2022 May 2;22(1):382. doi: 10.1186/s12877-022-03093-5.
PMID: 35501721; PMCID: PMC9059422.

Scope of the Problem: ED Environment



Scope of the Problem: We don't know who is cognitively intact

- ~25% of older adult patients have impaired cognition from any cause
- ADRD and Delirium are our two big ones here
- We miss most cases of both:
 - Reliance on either prior documentation or clinical gestalt misses more than half of all cases of permanent impaired cognition
 - Delirium is unrecognized up to 90% of the time, especially hypoactive delirium.

Han JH, Zimmerman EE, Cutler N, Schnelle J, Morandi A, Dittus RS, Storrow AB, Ely EW. Delirium in older emergency department patients: recognition, risk factors, and psychomotor subtypes. *Acad Emerg Med.* 2009 Mar;16(3):193-200. doi: 10.1111/j.1553-2712.2008.00339.x. Epub 2009 Jan 20. PMID: 19154565; PMCID: PMC5015887.

Dementia vs. Delirium

- A huge distinction
- Group all impaired cognition together where it makes sense, separate where it doesn't

Scope of the Problem: Missing Impairment Leads to Poor Outcomes

- Impaired cognition is associated with poor outcomes
- Unrecognized impaired cognition is worse
- >50% rate of adverse events after discharges by PLWD
- When cognitive impairment doesn't get recognized in ED it isn't on the floor in a large majority of cases

So Why Don't We Just Do Better?

- Geriatric ED Guidelines recommend screening older adults for impaired cognition.

ED Based Cognitive Screening

- Delirium: bCAM (brief Confusion Assessment Test), 3-D CAM
- Impaired Cognition: Short Blessed Test (SBT), Ottawa 3DY (03DY), Brief Alzheimer's Screen
- Both? The 4AT
 - 2 minutes to administer
 - Alertness, Abbreviated Mental Test, Attention (months of year backwards), Acute Change or fluctuating course
 - Scores 1-3 impaired cognition, 4 or more delirium

Nowroozpoor A, Dusssetschleger J, Perry W, Sano M, Aloysi A, Belleville M, Brackett A, Hirshon JM, Hung W, Moccia JM, Ohuabunwa U, Shah MN, Hwang U: GEAR 2.0-ADC Network. Detecting Cognitive Impairment and Dementia in the Emergency Department: A Scoping Review. *J Am Med Dir Assoc.* 2022 Aug;23(8):1314.e31-1314.e88. doi: 10.1016/j.jamda.2022.03.019. PMID: 35940682; PMCID: PMC10804640.

Carpenter CR, Bassett ER, Fischer GM, Shirshakan J, Galvin JE, Morris JC. Four sensitive screening tools to detect cognitive dysfunction in geriatric emergency department patients: brief Alzheimer's Screen, Short Blessed Test, Ottawa 3DY, and the caregiver-completed AD8. *Acad Emerg Med.* 2011 Apr;18(4):374-84. doi: 10.1111/j.1553-2712.2011.01040.x. PMID: 21496140; PMCID: PMC3080244.

O'Sullivan D, Brady N, Manning E, O'Shea E, O'Grady S, O'Regan N, Timmons S. Validation of the 6-Item Cognitive Impairment Test and the 4AT test for combined delirium and dementia screening in older Emergency Department attendees. *Age Ageing.* 2018 Jan 1;47(1):61-68. doi: 10.1093/ageing/afx149. PMID: 28985260; PMCID: PMC5860384.

But we don't use these

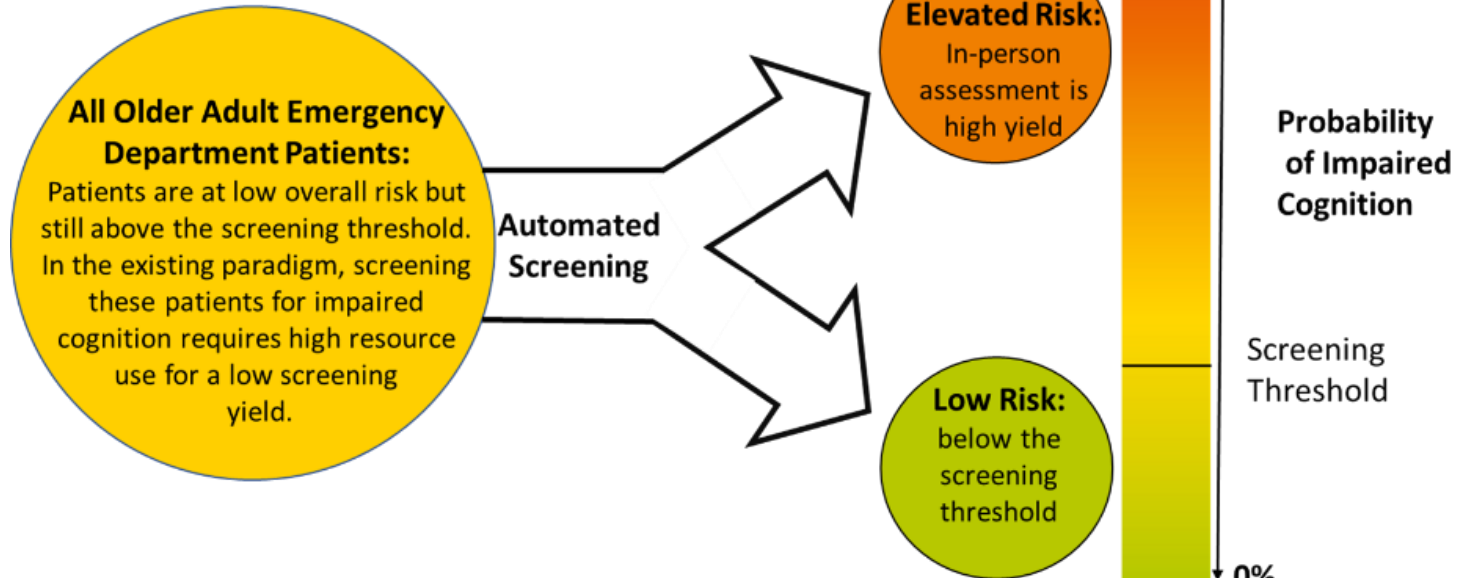
- Even most geriatric accredited ED's don't universally screen for cognitive impairment
 - Barriers to adding any new screening for anything
 - Why screen for something if you don't have a clear associated action?

So what do we do?

- 1. Screen Better
- 2. Develop care processes for patients with impaired cognition

Better Screening

Adding an Automated Classifier:
Risk stratification reserves testing resources for high-yield patients



Haimovich AD, Shah MN, Southerland LT, Hwang U, Patterson BW. Automating risk stratification for geriatric syndromes in the emergency department. *J Am Geriatr Soc.* 2024 Jan;72(1):258-267. doi: 10.1111/jgs.18594. Epub 2023 Oct 9. PMID: 37811698; PMCID: PMC10866303.

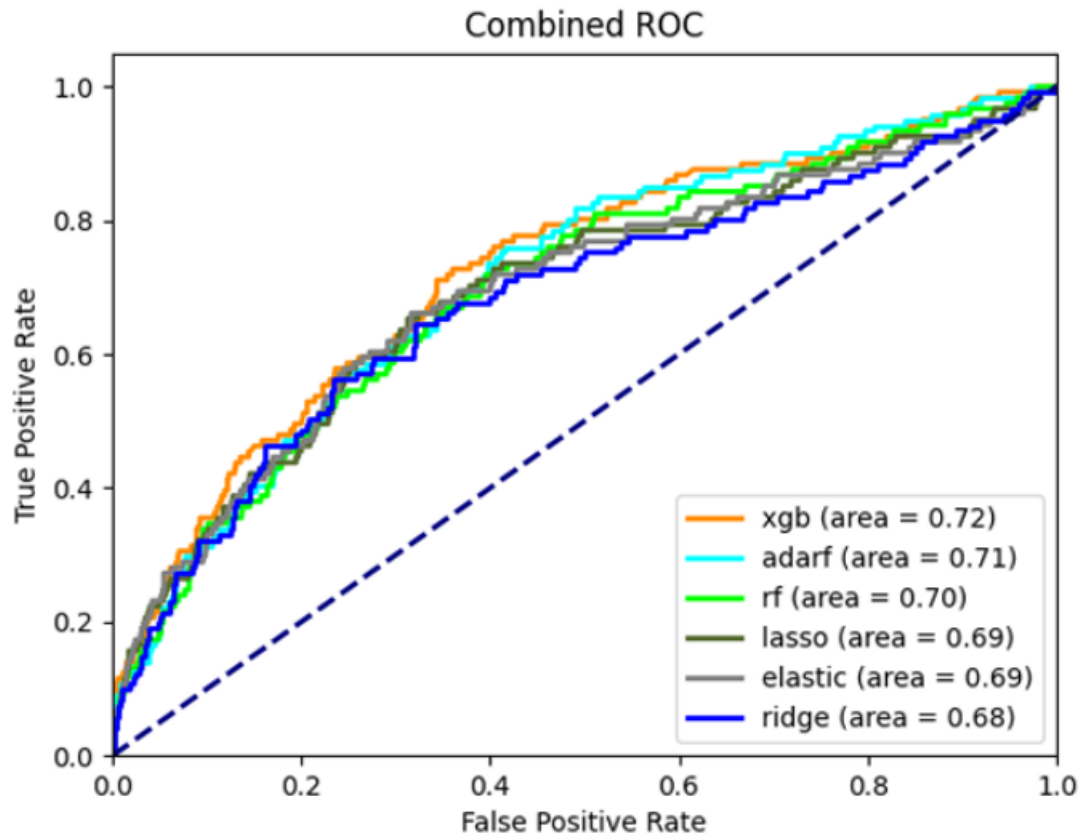
Determining Risk for Impaired Cognition Using Available Data

- Several Studies looking at phenotyping patients with known dementia in the EHR
- At least 12 studies looking at predicting patients at high risk for having or developing dementia
- General Concern: bias and sufficiency of EHR data

Walling AM, Pevnick J, Bennett AV, Vydiswaran VGV, Ritchie CS. Dementia and electronic health record phenotypes: a scoping review of available phenotypes and opportunities for future research. *J Am Med Inform Assoc.* 2023 Jun 20;30(7):1333-1348. doi: 10.1093/jamia/ocad086. PMID: 37252836; PMCID: PMC10280354.

What about in the ED?

- Take an existing set of patients: 1736 patients, 60 or older, discharged from ED, who had Blessed Orientation Memory Concentration (BOMC) testing as part of an RCT
- 7% had CI (BOMC 10 or >)
- Look at features: age, healthcare utilization data, comorbidities,



Yadgir SR, Engstrom C, Jacobsohn GC, Green RK, Jones CMC, Cushman JT, Caprio TV, Kind AJH, Lohmeier M, Shah MN, Patterson BW. Machine learning-assisted screening for cognitive impairment in the emergency department. *J Am Geriatr Soc.* 2022 Mar;70(3):831-837. doi: 10.1111/jgs.17491. Epub 2021 Oct 13. PMID: 34643944; PMCID: PMC8904269.



Early Results

TABLE 2. XGBoost model results at various thresholds

Threshold	Negative predictive value	Positive predictive value	Sensitivity	Specificity
0.10	1.00	0.07	1.00	0.02
0.20	0.99	0.07	0.99	0.06
0.40	0.97	0.13	0.73	0.64
0.50	0.96	0.15	0.58	0.76
0.80	0.94	0.47	0.12	0.99
0.90	0.93	0.57	0.07	1.00

Going Forward

- With larger sets of tagged data and newer data science techniques quite reasonable to assume we'll get better
- Lots of similar work outside the ED
- Remember, we aren't trying to label patients, just a high-risk cohort

Once We Detect:

- Here we can re-separate delirium and dementia
- Delirium: often admit vs. fix underlying source in a closely monitored environment
- Dementia: here we need to look to new models of care

Caring for Persons Living With Dementia in the ED

- Care models are built on identification
- Improving care within the ED
- Care Transitions

ED-LEAD

Emergency departments seek to transform Alzheimer's and dementia care through \$55M national research grant

Posted on November 14, 2023



<https://emed.wisc.edu/news/emergency-departments-transforming-alzheimers-and-dementia-care-research-grant/>

ED-LEAD Goal

ED-LEAD seeks to improve the care of PLWD and their care partners by addressing emergency and post-emergency care through different combinations of three dyad (PLWD + care partner) focused programs:

Program 1: Emergency Care Redesign (ECR)

Program 2: Community Paramedic-led Transition Intervention (CPTI)

Program 3: Nurse-led Telephonic Care (NLTC)

The Opportunity

- 80 site pragmatic trial
 - Includes 6 sites in Wisconsin
 - Emphasis on real-world implementation and adaptability
- Sites randomized to receive usual care or the three programs alone or in combination
- Seed funding to start these programs, see what works, and continue long-term

Study Outcomes

OUTCOMES

1) ED revisits

- Within 30 days (primary outcome), 14 days, and 6 months (secondary) of discharge

2) Hospitalization

- Within 14 days, 30 days, and 6 months of discharge (secondary)

3) Healthy days at home

- Within 6 months of discharge (secondary)



Improve transitional care and reduce future ED visits and hospitalizations

Health-Related Outcomes of ED-LEAD



ED-LEAD Implementation

- Pilot phase at UW Madison & NYU (October 2024)
- Randomization phase (80 site roll out)
 - 6-month pre-implementation period
 - Changes to electronic health record (EHR), staff hiring & training, preparing for operational changes
 - 6-month implementation period
 - Enrollment & delivery of programs
 - Medicare claims follow-up

Programs Overview

Program 1: Emergency Care Redesign (ECR)

Within the ED

Program 2: Community Paramedic-led Transition Intervention (CPTI)

30 days post-discharge

Program 3: Nurse-led Telephonic Care (NLTC)

6 months post-discharge

Improving Care within the ED:

- Comprehensive geriatric assessment
- Focusing on care partners
- Detecting delirium
- Fall Prevention
- Appropriate analgesia
- Changes to physical environment: lighting, noise, proximity to nursing, windows

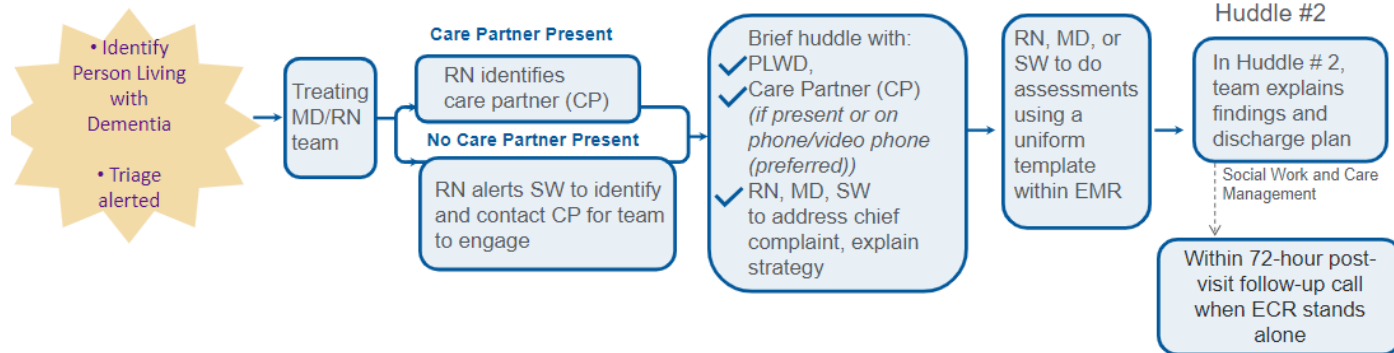
Dresden SM, Taylor Z, Serina P, Kennedy M, Wescott AB, Hogan T, Shah MN, Hwang U; GEAR 2.0-ADC Network. Optimal Emergency Department Care Practices for Persons Living With Dementia: A Scoping Review. *J Am Med Dir Assoc.* 2022 Aug;23(8):1314.e1-1314.e29. doi: 10.1016/j.jamda.2022.05.024.

PMID: 35940683.

Emergency Care Redesign

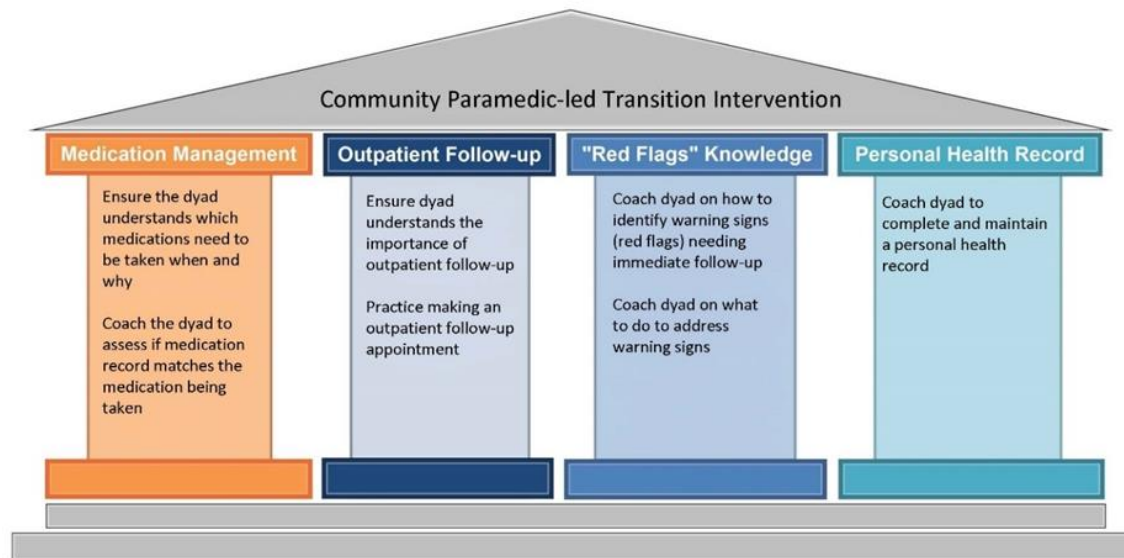
- Attention to psychosocial needs of person living with dementia/care partner
- Two in-person huddles
- 72-hour follow-up phone call

Workflow proposed:



Community Paramedic-led Transitions Intervention

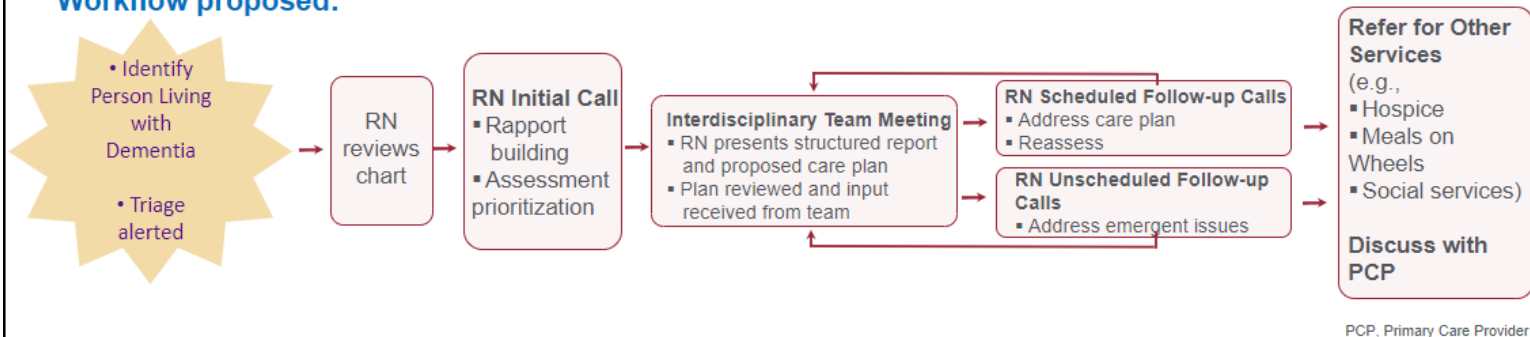
- Coaching model focused on the “four pillars”
- 1 home visit and up to 3 follow-up phone calls
- The team’s previous study found that CPTI significantly reduced the odds that patients with impaired cognition returned to the ED for care within 30 days



Nurse-Led Telephonic Care

- Structured program with initial assessment, care plan development, follow-up phone calls for 6 months
- Behavioral symptom support for care partners and training for nurses
- Nursing learning network across multiple sites

Workflow proposed:



Questions/Comments?

- Thanks to my collaborators, especially Manish Shah, Andrea Gilmore-Bykovskyi, and Megan Jenkins-Morales