

**DETECTING AND MANAGING DELIRIUM IN
PERSONS WITH DEMENTIA:**
Integrating Technology and Human Intelligence

Donna M Fick, PhD, GCNS, FGSA, AGSF, FAAN
Director of the Tressa Nese and Helen
Diskovich Center of Geriatric Nursing
Excellence

PennState
Ross and Carol Nese
College of Nursing

CONTACT:
✉ dmf21@psu.edu
✈ @agilis

[illegible]

Disclosures

Conflicts of Interest: none

Thank you and Acknowledgement to:
NIA/NIH Grant #R01 AG030618

Gratitude to: MPI Dr. Edward Marcantonio
Co-Investigator's
Older adults & families
Field team/RA's/Students

[illegible]

Objectives

- | Briefly describe the evidence & gaps in Delirium and Delirium in Persons with Dementia (PWD)
- | Discuss quantitative and qualitative results of the NIH READI trial on Delirium and DSD
- | Discuss future research and practice challenges and opportunities in delirium care

[illegible]



Building Community

Must include culture curiosity, shared values (What Matters) & "knowing" your community

LEARN from each other / Listen

Co-design & shared credit and resources is integral (PCORI quotes & grant budget)

Technology can & will play a role

Human touch and care for others is timeless celebrations, praise and shared stories

4

READI-SET-GO Community Strengths

Co-PIs:
Dr. Donna Fick & Dr. Ed Marcantonio

RAs:
Gay Chiles, Caroline Leslie, Michele Henry, Kayli Barefoot, Kayla Probert, Melissa Kilpa, Shash Banerjee, Jess Garrity

Statistical Support:
Emily Wolfson, Dr. Long Ngo

IT & Data support:
Dr. John Hannan
Site Data Leads

Co-Is:
Dr. Marie Boltz, Dr. Sharon Inouye

PMs PDs, Clinical Coordinators:
Kerry Palihnich, Lily Fanburg, Dr. Jessica Fleming, Michelle Ward

Collaborators:
Dr. Priyanka Shrestha, Dr. Erica Husser

Clinical Site Leaders:
Tiffany Cabibbo, Michele Szkolnicki, Shelly Calder, Rollin Wright, Leandra Davis

5



But first a story:

(THE WHY)

Juanita

6

Case Study: Mr. K.

Case trajectory:

66-year-old male Mr. K. with down syndrome who worked PT & is on Medicaid.

Presented to a rural hospital with prior IADLS—living with his mom, cooking, cleaning, walking 1 mile per day and volunteering at his local food bank. He has had decline in cognition, per his mother but was not assessed.

He is admitted with pneumonia. He won't stay in bed, is restless & at times sleepy, with occasional disorganized & illogical speech, and disruptive outbursts.

You remember that you learned something about delirium but you have 4 other patients to tend to...

Option 1

You check the prn orders & give Mr. K. lorazepam which sedates him. He does not bother you for the rest of the night. Medication is continued and Seroquel is added – Mr. K. stays in bed with minimal responsiveness to nursing staff until discharge two days later when they are able to find a Medicaid NH bed.

He goes to the NH in a wheelchair, communicating and eating poorly with a decline in mental and physical function.

In the NH he is kept in the WC and kept on the meds from the hospital. He is not assessed for delirium in real time—and his cognitive and physical functional decline accelerates.

7

Delirium Can Be a Medical Emergency



News about Family Awarded \$10 Million After Mother's Death At ... >



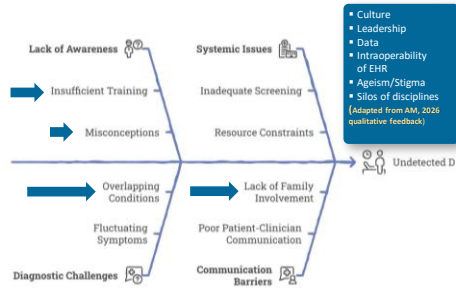
DELIRIUM - 4d

Family awarded \$10 million after mother's death at Cincinnati hospital

Terri Price, a 69-year-old grandmother, died in March 2020 after being admitted to the...

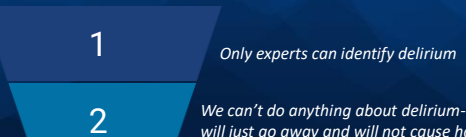
8

Causes of Undetected Delirium in Healthcare Settings



9

Myths



- 1 *Only experts can identify delirium*
- 2 *We can't do anything about delirium-it will just go away and will not cause harm*

[illegible]

Delirium and Outcomes

- └ Meta-analyses of observational studies show that delirium is independently associated with:
 - In-hospital complications
 - Mortality (hospital + long term)
 - Institutionalization (post-hospital + long term)
 - Incident (new) dementia
- └ Delirium associated with long term cognitive decline in 24/24 studies, OR=2.3 [1.9-2.9]

Witlox, JAMA 2010; Goldberg, JAMA Neurology 2020

Delirium in PWD Outcomes

Delirium incidence (medical service): 32%	
Length of Stay	Delirium: 9.2 days No delirium: 5.6 days
1-month mortality rate: 25%	
1-month function: ↓ADLs, ↓IADLs	

Fick et al, *J Hosp Med*, 2013

Delirium in Patients with Dementia: Why It Matters

- High prevalence & risk
 - ~30–70% of hospitalized older adults with dementia develop delirium (Fick et al., 2022; De Biasi et al., 2023)
 - >3× higher mortality risk (Thein et al., 2020)
 - Our (your) current data from RSG shows nurse are missing this group
- Worse long-term outcomes
 - Accelerated cognitive decline (Goldberg et al., 2020)
 - Experiencing delirium in persons with dementia causes cognitive decline in persons with dementia to proceed at 2.2 times the rate versus without delirium (Gross et al., Arch Int Med, 2012)
 - >2× higher institutionalization risk (Witlox et al., 2010)
 - Persistent symptoms and poor recovery common (De Biasi et al., 2023)
- Why health care professionals should care and GAPS
 - Delirium is common, serious, and **OFTEN MISSED** in dementia (De Biasi et al., 2023)
 - Contributes directly to **complications, longer stays, and decline** (Thein et al., 2020)
 - This is happening to real people—**POWER** of your **STORIES**

13

Across Settings of Care

- In a **community setting**, a study found that 3.64% of patients evaluated at a memory care clinic, the majority of whom had an underlying dementia or cognitive impairment diagnosis, were subsequently diagnosed with delirium (Manni et al., 2021)
- Study in **Nursing Home patients** found that those with delirium in the hospital were more likely to have the delirium missed in the NH and be labeled with a new incident dementia (Briesacher et al, 2021)
- Delirium occurrence increases with age:

9% of those aged 50-64	35% of those aged 65-89
20% of those aged 65-74	50% of those aged 90+

(Gan et al., 2025)

14

Delirium Prevention Works

- Multicomponent:
HELP, proactive geriatrics consultation, Age-Friendly Care Bundle
- Single component:
↓ sedation, mobilization in ICU, IV (Current trial-acetaminophen in cardiac surgery)



Inouye et. al. *NEJM*, 1999; Marcantonio et. al., *JAGS*, 2001
Needham et. al., *JAMA* 2008; Subramaniam et. al, *JAMA* 2019
Rosner et al., *JAGS* 2026

15

What is Delirium?

Delirium is an **acute, reversible state of confusion** that comes on suddenly (hours, days, weeks) and last hours to days or longer. There is often impaired thinking, inattention, altered loc and behavior changes.

Delirium is common (25-30% in Med-Surg, > 50% in other populations like surgical, ICU, persons with dementia). Over 70% in Dementia

There are no medications approved for the treatment of delirium and treating with medications can cause or worsen delirium.

Clinicians treat delirium by identifying and treating the underlying causes, preventing complications, & restoring function.

Nursing, family, other clinician burden of delirium is great-especially if undetected or poorly treated.

16

CAM Diagnostic Algorithm

- └ Feature 1: Acute change, fluctuating course
- └ Feature 2: Inattention
- └ Feature 3: Disorganized thinking
- └ Feature 4: Altered level of consciousness

Positive Delirium:

Requires presence of:

- Features 1 and 2
- and *either* 3 or 4

Inouye et. al., *Ann Int Med*, 1990.

17



18

3D-CAM: 3-Minute Diagnostic Assessment for CAM-defined Delirium

CAM Feature	Cognitive testing & Patient Symptom Probes	Interviewer Observations
Feature 1: Acute Change/Fluctuating Course	Self-report of confusion, disorientation, hallucinations	Fluctuation: consciousness, attention, speech/thinking
Feature 2: Inattention	Digit span: 3, 4 backwards Days of week, Months of year backwards	Trouble keeping track of interview Inappropriately distracted
Feature 3: Disorganized Thinking	Orientation: year, day of the week, location (hospital)	Flow of ideas: unclear, illogical Conversation: rambling, off-target, OR limited, sparse
Feature 4: Altered Level of Consciousness	None	Sleepy, stupor, or comatose Or Vigilance

Any one "positive" item triggers Feature



19

Ultra-brief Delirium Screens

- Initial screen to rule out delirium quickly
 - Not diagnostic: only modest specificity
- Best single item (MOYB): detects >80%
- UB-2: Best two item screen (DOW, MOYB)
 - Sensitivity 93%, Specificity 62%
 - Takes 35 seconds to administer

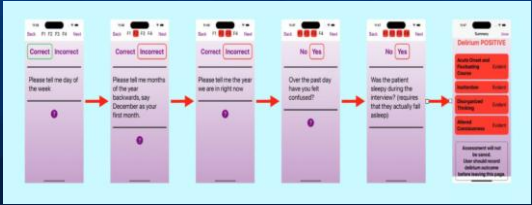


Fick et. al., J Hosp Med, 2015

20

UB-CAM Delirium Screen App

Available (for free) at Apple and Google Play Store



Kusmik et. al., JAGS 2023

21

Contact Information:

Donna Marie Fick | Edward R. Marcantonio
dmf21@psu.edu | emarcant@bidmc.harvard.edu

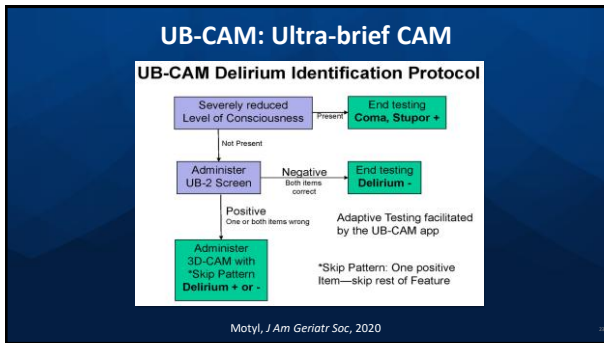
Link to our website:
<https://www.ub-cam-delirium-screening.org>
FREE training materials and videos

UB-CAM app can be downloaded here using the QR codes below:

SCAN ME

Acknowledgement of funding by NIH-NIA R01AGO30618 and gratitude to the full study team and older adults

22



23

READI: UB-CAM Implementation Study

Marcantonio, Fick, et. al, *Ann Int Med* 2022

BIDMC & PA Community Hospital

527 hospitalized older adults

>1/3 with dementia / AD

399 MDs, RNs, CNAs vs reference standard

MAIN FINDINGS

UB-CAM completed > 97%

Overall accuracy = 89%

Avg. completion time: 1 min 15 secs

Skip pattern ↓ admin time, no ↓ accuracy

RNs = MDs, CNAs can administer UB-2

24

Data on Accuracy UB-CAM in PWD (N=183)

81

Mean age of persons with AD/ADRD in the study

42%

Male

88%

Non-Hispanic white

Dementia measure—Proxy AD8, Chart review and adjudication of uncertain cases

Nonverbal cases excluded

Overall rate of delirium in persons with AD/ADRD enrolled in READ!

73/183 (40%)

The UB-CAM two-step protocol overall accuracy: 79% (CI, 75% to 84%)

Sensitivity: 66%

Specificity: 86%

Importantly, the UB-CAM had a positive predictive value of over 2/3 in PLWD, and a likelihood ratio positive of 4.6, meaning that a positive test increased the likelihood of delirium by 4.6 times.

25

DSD Qualitative Data Themes N=14

1. Low baseline cognition makes the detection of delirium challenging

2. Chalking up behavior or mental changes to dementia.

3. Knowing the person helps with detecting delirium.

4. Role of family: assessment and support.

"Sometimes when they have dementia, I don't even ask them any questions..." (RN)

"I'm not sure it can separate delirium from dementia (pause) someone with dementia will have a hard time communicating." (MD)

"They are going to fail those questions whether they are delirious or not." (MD)

"They have dementia so you expect this. People who are confused they get up and they fall." (MD)

"A lot of the times the nursing assistants know the patients better than the nurses do, or the doctors. We are the ones that spend real time with them." (CNA)

"I think they are pretty good indicators (in picking up DSD), but it depends on the stage of dementia". (RN)

26

Comparative Study

Ann Intern Med. 2022 Jan;175(1):65-73. doi: 10.7326/A21-1887. Epub 2021 Nov 9. <https://pubmed.ncbi.nlm.nih.gov/34748377/>

Comparative Implementation of a Brief App-Directed Protocol for Delirium Identification by Hospitalists, Nurses, and Nursing Assistants : A Cohort Study

Edward R Maricantano ¹, Donna M Fick ², Yoonjin Jung ³, Sharon K Hooge ⁴, Marie Billo ⁵, Douglas L Leslie ⁶, Jozsa K Husar ⁷, Ryszarda Stenette ¹, Kristen Moore ⁷, Kimberlyann Saltsome ⁸, Jonathan Suta ⁹, Malaz Boustaniri ¹⁰, Long H Ngo ¹¹

Affiliations: [expand](#)

PMID: 34748377 PMCID: PMC8938856 DOI: 10.7326/A21-1887

JAMA Internal Medicine

Home Issues Multimedia

Issue | JAMA Internal Medicine | Vol. 182, No. 7

Invited Commentary | Aging and Health

Improving Delirium Identification in Hospitalized Older Adults

Edward R. Maricantano, MD, MEd¹, Donna M. Fick, RN, PhD² <https://pubmed.ncbi.nlm.nih.gov/40423986/>

27

How Do We Bring Delirium Screening to All?



Implementing Systematic Delirium Identification and Management with UB-CAM

MPI Fick, Penn State Nese CON
Marcantonio, Beth Israel/Harvard
3 Sites in CENTRAL PA & BOSTON

READI-SET-GO !

- Hospitalized older adults aged 70+
- EHR integration, **stepped-wedge design**
- 6 acute med-surg units, 3 hospitals

Aim #1: accuracy of delirium detection
Aim #2: patient, family and staff outcomes (1,050 older adults)
Aim #3: rate of complications from delirium (sample of 20,000)

NIH Funding 2023-2028 R01AG030618



28

Quotes from Stakeholders—Persons Living with Dementia and Caregivers with Delirium Experience

"We should not be a burden to the nurse or doctor—we do not like the word burden" (we took this out of the scale-use distress)	If you want to have a successful training, have a person with lived experience train students to educate about what is and what not respectful, what needs are there and start off with right language.
"They run to Haldol as treatment; confusion turns into a psych evaluation rather than an evaluation for what could have caused this reaction (whether they are dehydrated or other reasons).	"Slow down while asking questions, education is first step need to be done before anything, make recordings of people living with dementia and show it in class and show it to hospital staff"

29

When people are at the table as a community is just as or more important—co-creating **BEFORE** we have a solution in mind—before grant aims or delirium practice plan finalized. (*We Will Be Jaguars by Nenquimo*)

Appropriate smallness—right sizing of expectations-small & ordinary acts everyday builds a community (*Kate Bowler*)

The "WHEN" and "How" of Community



30



34

Improving delirium assessments

- **Objective tools**--accurate, validated, trained
- **Tools in EHR** (easy to do right thing) & other technology
- **Think delirium** (Before labeling/exp in AC)
- **Leadership, System, Policies**-- prioritizing/incentivizing (CMS Measure)
- **Experience**--seeing it work-ex nurse with pt infection & drug delirium that was initially ok)
- **Training**--Integrate into Annual Competencies/Feedback
- **Human Stories**--celebrate staff, engage older adults and families



35



HANDS ON EDUCATION & support embedded into system

36

Behavior Approach In the Moment

- OTHER APPROACH for staff in the moment **"TA-DA-A"**
T (Tolerate), **A** (Anticipate triggers) **DA** (Don't Agitate), **A** (Activity/ambulate)
- Helps to have staff actually practice this and practice stopping and reflecting (breathing) when encounter behaviors rather than reacting or medicating OA
- ALL Behavior Has Meaning-consider BSPs for all persons with dementia-USE DICE <https://diceapproach.com/>

37

Case Study: MR. K Revisited

- COMMUNICATE—You call and talk to the family (or NH, hospital, neighbor) to get his baseline before his hospitalization with the goal of optimizing his abilities and prior function (KNOW the pt & What Matters).
- SCREEN—You screen for delirium and he is delirium positive. Instead of covering up behavior with meds—YOU check if the patient needs to toilet, is in pain, fearful or other reasons for the behavior (ABHM). What makes him happy, fearful, who are important people in his life?
- ACT—ASSESS CAUSES & ask What activities do they enjoy? Provide distraction activities from the BRAIN toolkit. You work with OT/PT/RT to restore his function with mobility, nutrition/hydration, deprescribing and activities that have meaning for him. You TAPE a one-minute video from his family in case he get restless (see paper by Wazynski et al., 2018)
- ENGAGE—Family PT/aide take them for a walk & do simple exercises in bed to keep moving when sicker. Assess daily for other delirium risks/causes, initiate scheduled toileting & every 12 hour Tylenol. After antibiotics & hydration he is less confused & can follow some instructions, by day three he is delirium negative and goes home with delirium prevention tips & home support/f/u clinic Area Agency on Aging.

38

Future Research

- Improvements in UB-CAM & other **Tools for Delirium in ADRD**
- Using **AI** to detect Delirium—LLM, Sensors in home, Posture, Gait, Eye tracking—(Wang et al., 2025. Mayo Clinic AI group)
- Severity measures** for Delirium and Delirium/ADRD
- Pathophysiology and **Biomarkers**/Connection with D/D/D
- Individualized **Behavior Support Plans** in EHR as Prevention
- Policy-CMS Age-Friendly Measure Outcomes**
<https://www.johnahartford.org/resources/view/cms-guidance-on-the-age-friendly-hospital-measure>

39

Join NIDUS and Connect to Delirium Research

What is NIDUS? Network for Investigation of Delirium: Unifying Scientists!
This NIA-funded* research network is dedicated to advancing the study of delirium through collaborative studies, use of NIDUS research resources, career development opportunities, and dissemination of delirium science.

*NIA grant no. P30AG057146-01A1, NIDUS, Johns Hopkins University, OH



Get Involved with NIDUS!

Visit deliriumnetwork.org to join NIDUS, subscribe to our newsletter, & access our blog, news, and resources

2027 NIDUS Bootcamp
June 25-27, 2027
Orlando, FL
Before 2027 AGS Annual Meeting
Applications open 10.1.26

\$ 40K Pilot Grants
LOIs open 10.1.26, closes 1.2.27

\$ 10K Early Investigator Travel Awards
More details to come soon

Next NIDUS Webinar:
Title: Disrupted Brain Injury Metabolism and Delirium
Speaker: Colin Cunningham, PhD, Trinity College, Dublin, Ireland
Date: Wednesday Sept 23, 11-12 EST

Register:
<https://us03web.zoom.us/j/84411111111>
(H4) All registration

40

Think Delirium



41

Think Delirium

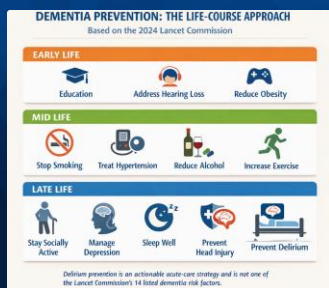


- Understanding Behavior As Communication
- KNOW THE PERSON
- AVOID DRUGS
- WE!
- Use Accurate Delirium Tools Regularly (& train)

42

14

Delirium Place in the 2024 Lancet Commission Paper



43



Communities have a shared sense of purpose, values
"Advocate for delirium with a unified voice" idelirium

44
