Delirium Prevention in Persons with Dementia: A Person-Centered Approach

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Objectives
❖ 1. Describe DSD prevalence & outcomes
❖ 2. Discuss delirium assessment and prevention in persons with dementia in current trials and in practice
❖ 3. Discuss Person-Centered Care Principles
❖ 4. Identify barriers and facilitators to translating DSD prevention into bedside clinical practice & future areas of research and practice

MY MAIN MESSAGES TODAY
❖ DSD is costly, deadly & distressing for the patient, family, clinician & system—but is often overlooked or ignored
❖ Only a few trials have included DSD
❖ Don’t be afraid to “THINK”, say and ASSESS for Delirium in Persons With Dementia
❖ KNOWING the older adults & focusing on strengths of the person is key—and many good clinical resources exist to HELP

“Delirium is a transient mental disorder, characterized by globally impaired cognitive functions and reduced ability to sustain or shift attention. The disturbance develops over a short period of time (hours, days, minutes) and generally fluctuates during the course of the day. Delirium normally only lasts for a few days—but may persist for weeks or even months. It usually has a underlying medical cause and is normally reversible and preventable” (APA, 1994; 2000).

Delirium Superimposed on Dementia (DSD)
OVER HALF OF HOSPITALIZED OLDER ADULTS WITH DEMENTIA WILL DEVELOP DELIRIUM—OVER 80% SUBSYNDROMAL DELIRIUM. DEMENTIA is the MOST COMMON risk factor for Delirium.
Evidence Base for Delirium and Dementia Connection is Growing

- New cognitive impairment:
  - Increased risk in new development of dementia over the next 4 years
- Worsening function & increased mortality in hospital patients with dementia after a delirium episode
- Patients with Alzheimer’s who develop delirium:
  - Rate of cognitive decline is doubled in the year after delirium compared to those without delirium
  - More rapid rate of decline persists for 5 years


Poor Outcomes

- MOST INTERVENTION TRIALS FOR DELIRIUM HAVE EXCLUDED PERSONS WITH DEMENTIA
- AND DELIRIUM IS OFTEN MISSED AT BEDSIDE...

Though Delirium Occurs Most Commonly in Persons With Dementia—Recognition and MEASUREMENT of DSD Is MORE Difficult than delirium alone—Impacting DSD TX Trials & Results

Study of Accuracy of Nursing Documentation

- Retrospective descriptive study from a larger prospective study
- Chart audit examining nursing documentation of delirium and delirium features
- Sample: 104 inpatients with dementia—53 experienced some delirium/51 did not (based on trained RA assessment)

**Findings:**
- The word “Delirium” was NEVER used
- Nurses used other terms to describe delirium features & to intervene

Reference: Steis & Fick, 2012
Why is it hard to recognize AND MEASURE Delirium?

Lack understanding of THRESHOLD for DSD Baseline & recovery
Quiet Patients Often Overlooked
OVERLAP with Dementia Stupor in delirium debated

Objective Tool to Assess Mental Status Not Used
OR Lack of Training
Lack understanding of PATHOLOGY

4 Key Features of Delirium Measured by the Confusion Assessment Method
Positive=features 1 & 2 & either 3 or 4 (Inouye et al., 1990)

1) Acute onset and/or fluctuating course
2) Inattention
3) Disorganized thinking
4) Altered level of consciousness

3D-CAM Contents

<table>
<thead>
<tr>
<th>CAM Feature</th>
<th>Cognitive testing and Patient Interview Items</th>
<th>Interviewer Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Change/</td>
<td></td>
<td>2. Fluctuation: attention 3. Fluctuation: speech/thinking</td>
</tr>
<tr>
<td>Fluctuating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inattention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disorganized</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thinking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feature 4:</td>
<td>None</td>
<td>1. Sleepy, stuporous, or comatose 2. Hypersignificant</td>
</tr>
<tr>
<td>Altered Level of Consciousness</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2-ITEM QUESTION: Test Boston & PA with nurse aides, physicians, RNS

01 What is the day of the week?
02 Please Tell Me The Months of the Year Backwards

Fick et al., Journal of Hospital Medicine, September, 2015
Multicomponent Intervention Strategies

- cognitive reorientation
- nonpharmacologic sleep protocol
- early mobility and/or physical rehabilitation
- adaptations for visual and hearing impairment
- nutrition and fluid repletion
- pain management
- appropriate medication usage
- adequate oxygenation
- prevention of constipation

DSD TRIALS

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Results</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse led protocol &amp; education for detection with nurse aide measures targeted to dementia, sensory, mobility, pain</td>
<td>n = 80 matched patients, 15% with dementia. Delirium post-protocol decreased from 37.5% to 13.8%, 12 patients with dementia, 6 pre &amp; 1 post developed delirium</td>
<td>Robinson et al. 2008 (observational, matched comparison) Chart-CAM</td>
</tr>
<tr>
<td>Delirium Abatement Program-Post-acute care-detect, treat causes, prevent, restore function</td>
<td>n=457, Improved detection of delirium (41% vs 12%), no impact on delirium persistence-129 (46%) had dementia in intervention group</td>
<td>Marcantonio 2010 (C-RCT) Screened over 5,000, 12 sites</td>
</tr>
<tr>
<td>Education to increase delirium recognition in persons with Alzheimer’s targeting families in home setting</td>
<td>Pilot, n=6 (all dementia) Improved detection of delirium by families using case vignettes—better detection by daughters</td>
<td>Bull et al. 2013 &amp; personal communication</td>
</tr>
</tbody>
</table>

NIH DELIRIUM TRIALS AT PSU
http://clinicaltrials.gov/

RESERVE
- Focus on DSD
- RCT Intervention
- SINGLE Component
- Post-acute Care
- Patient Centered

END-DSD
- Focus on DSD
- C-RCT Intervention
- MULTI-Dimensional
- Acute Hospitalization
- Nurse & Pt Centered

END DSD STUDY AIMS

- Evidence is lacking on non-drug approaches and nurse led interventions
- We do not know if clinicians can reliably assess for DSD
- We lack evidence on whether we can prevent DSD or impact clinical outcomes

MULTI-DIMENSIONAL APPROACH: 4 COMPONENTS/BUNDLE

“Adaptive versus Technical Fix”

- Education—initial/ongoing-staff nurse driven—> 300 nurses-100%
- Electronic Health Record—3 Screens-different sites and systems but same content
- Weekly Rounds on every shift with Unit Champions who are direct care nurses
- Feedback loop to UCs and nurses on CAM use, delirium—ADAPTIVE versus TECHNICAL fix
Delirium EDUCATION (JAGS, Yanamadala, et al., 2013)

- NEEDED but not enough alone
- Initial but MUST have ongoing-weekly/monthly
- Peer (champion) support, newsletters, pocketcards
- BOOSTER sessions-short, on the unit and DRIVEN by NURSING staff needs and gaps—let nurse help deliver content—the best way to teach someone is to have them TEACH you—the people who have the problems also have the solutions
- Rounding and case studies (Naughton videos) must have a FEEDBACK loop

PERSON-CENTERED CARE

- A few studies such as Robinson (2008) & work by Kolanowski & Van Haitsma (2013) suggest a person-centered & well-being (positive) approach is important in older adults may improve DSD
- Focus on UNMET NEEDS—needs and response based behaviors (NOT behavior as “problematic”)
  - www.nursinghometoolkit.com
  - PERSON FIRST LANGUAGE
    - Facilitating patient values, preferences, identity, history
    - Individualized cognitive activities geared to INTERESTS & COGNITION
    - Getting to KNOW THE PERSON—All About Me Board
    - Focusing on STRENGTHS and POSITIVE behaviors (not negative outcomes and behaviors)

PERSON-CENTERED CARE TOOLS

- An increasing number of tools to assess preferences and values of older adults and inform knowing the person exist (Van Haitsma et al., Gerontologist, 2013) but few focus on the hospital setting
- A 2013 review by Edvardsson and colleagues in Gerontologist reviewed 12 tools for PCC—and found only one specific to acute care

SIGNIFICANT GAPS EXIST IN PCC

- We know very little about how to bring together definitions of person-centered care and how to measure the best outcomes for PCC—despite a recent AGS paper on Person-Centered Care (Expert Panel on Person-Centered Care, 2016)
- The barriers and facilitators to PCC in the acute setting are not known
- We need a better understanding, measurement & balance of preferences and values with patient risk and the goals of acute medical care
PCC Possible Role delirium & dementia behaviors

- Understanding Agitation and Behaviors
- Non-Drug strategies 1st: behavioral interventions, family participation, person-centered approach
- KNOW the person—most or all behavior has meaning, unmet needs, understand goal and emotion
- Pharmacologic approaches are a LAST RESORT—reserved for severe agitation: beware of vicious cycles of medications and worsening delirium

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Multicomponent Interventions for Nurse Prevention/Management of Delirium

Multicomponent interventions with the EMR and weekly rounds (750) on every shift with APN

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Sleep Protocol for Hospitalized Older Adults (McDowell, et al., 1998)

- Limit caffeine after 11am
- Exposure to sunlight
- Minimize daytime napping
- Noise level
- Nighttime routine: Backrub, warm drink, music, warm milk or decaf tea
- Help older adult understand normal aging changes with sleep architecture
- Mobilize

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2015 AGS BEERS CRITERIA

Medications to Avoid in Delirium & Dementia

Minimizing psychoactive medications documented in 549/750 or 75% of rounds forms

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CONSORT Flow Diagram END-DSD

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Comparing Bedside RN and Trained RA CAM Data

- Goals of this sub-analysis were to examine direct care registered nurse (RN) ADHERENCE to using the CAM in the hospital electronic health record and calculate percent agreement with trained Research Assistants (RA).
- Timing of RA and RN assessment within same day but not at same time in RN charting makes comparison difficult.

Adherence & Number of CAMS Completed By Direct Care RNs

- **100% Partial Compliance**-Bedside nurse completed at least 1 CAM per pt/hospital day.
- **83.9% Full Compliance**-Completed at least 2.
- Initial agreement with RAs was low.

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### Table 3. Descriptive Statistics (n, % of total) and Agreement between RN and RA Documentation of Presence (always and by Intervention and Control)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Control Level</th>
<th>Intervention Level</th>
<th>RA Documented Positive</th>
<th>RN Documented Positive</th>
<th>Kappa (95% CI)</th>
<th>Test of Symmetry (N, p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chart Documentation Only</td>
<td>No</td>
<td>128 (73.2)</td>
<td>204 (42.6)</td>
<td>0.021</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>84 (26.8)</td>
<td>22 (2.4)</td>
<td>0.009 - 0.087</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Chart or ENE Documentation</td>
<td>No</td>
<td>129 (73.2)</td>
<td>26 (26.9)</td>
<td>0.201</td>
<td>p = 0.017</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>77 (26.8)</td>
<td>95 (73.1)</td>
<td>0.016 - 0.164</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Chart Documentation Only**</td>
<td>No</td>
<td>570 (74.5)</td>
<td>157 (23.2)</td>
<td>0.220</td>
<td>p = 0.0001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>171 (25.5)</td>
<td>214 (76.8)</td>
<td>0.803 - 0.831</td>
<td>&lt; 0.0001</td>
<td></td>
</tr>
<tr>
<td>Chart or ENE Documentation**</td>
<td>No</td>
<td>570 (74.5)</td>
<td>171 (25.5)</td>
<td>0.220</td>
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<td>214 (76.8)</td>
<td>0.803 - 0.831</td>
<td>&lt; 0.0001</td>
<td></td>
</tr>
</tbody>
</table>

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### Table 4. Descriptive statistics and tests by group for medications

<table>
<thead>
<tr>
<th>Medication Variable</th>
<th>Control N</th>
<th>Median (IQR)</th>
<th>Intervention N</th>
<th>Median (IQR)</th>
<th>t</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Number of Unique Rx</td>
<td>167</td>
<td>164 (17.6)</td>
<td>224</td>
<td>154 (17.8)</td>
<td>2.75</td>
<td>0.0063</td>
</tr>
<tr>
<td>Number of Tylenol Rx</td>
<td>167</td>
<td>2.0 (2.0)</td>
<td>224</td>
<td>2.0 (2.0)</td>
<td>2.26</td>
<td>0.0249</td>
</tr>
<tr>
<td>Times Tylenol Rx Given</td>
<td>82</td>
<td>53 (7.0)</td>
<td>81</td>
<td>55 (8.0)</td>
<td>1.27</td>
<td>0.2084</td>
</tr>
</tbody>
</table>

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**AChE Scale**

<table>
<thead>
<tr>
<th>Total Score for AChE Rx</th>
<th>167</th>
<th>57 (17.1)</th>
<th>224</th>
<th>12.7 (17.1)</th>
<th>2.58</th>
<th>0.0102</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Score for Tylenol Rx</td>
<td>167</td>
<td>57 (17.1)</td>
<td>224</td>
<td>12.7 (17.1)</td>
<td>2.58</td>
<td>0.0102</td>
</tr>
<tr>
<td>Number of AChE Rx</td>
<td>167</td>
<td>0.0 (0.5)</td>
<td>224</td>
<td>0.2 (0.4)</td>
<td>2.35</td>
<td>0.0180</td>
</tr>
<tr>
<td>Number of Tylenol Rx</td>
<td>167</td>
<td>0.0 (0.5)</td>
<td>224</td>
<td>0.3 (0.9)</td>
<td>2.35</td>
<td>0.0180</td>
</tr>
<tr>
<td>Total Score for AChE Rx Given</td>
<td>29</td>
<td>58 (15.0)</td>
<td>17</td>
<td>4.2 (1.5)</td>
<td>-1.24</td>
<td>0.2204</td>
</tr>
<tr>
<td>Total Score for Tylenol Rx Given</td>
<td>29</td>
<td>58 (15.0)</td>
<td>17</td>
<td>4.2 (1.5)</td>
<td>-1.24</td>
<td>0.2204</td>
</tr>
<tr>
<td>Times Tylenol Rx Given</td>
<td>82</td>
<td>53 (7.0)</td>
<td>81</td>
<td>55 (8.0)</td>
<td>1.27</td>
<td>0.2084</td>
</tr>
</tbody>
</table>
Intervention nurses also used more non-drug approaches

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Type</th>
<th>N</th>
<th>SD</th>
<th>M</th>
<th>AD</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep Enhance</td>
<td>2.756</td>
<td>2.002</td>
<td>0</td>
<td>0</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Mobility Enhance</td>
<td>1.063</td>
<td>1.258</td>
<td>3.213</td>
<td>2.064</td>
<td>0.938 (0.209 - 0.788)</td>
<td></td>
</tr>
<tr>
<td>Enhanced Communication &amp; Orientation</td>
<td>5.521</td>
<td>4.246</td>
<td>0</td>
<td>0</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td>0.014</td>
<td>0.130</td>
<td>--</td>
<td>--</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Fall Prevention</td>
<td>3.375</td>
<td>2.455</td>
<td>0.073</td>
<td>0.261</td>
<td>(2.171 - 9.007)</td>
<td></td>
</tr>
<tr>
<td>Hydration/Nutrition</td>
<td>3.565</td>
<td>2.706</td>
<td>1.007</td>
<td>1.297</td>
<td>2.088 (2.190 - 6.970)</td>
<td></td>
</tr>
<tr>
<td>Delirium Discharge Teaching</td>
<td>1.291</td>
<td>0.547</td>
<td>0</td>
<td>0</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Cognitive Stimulation</td>
<td>0.169</td>
<td>0.506</td>
<td>0</td>
<td>0</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Avoid Sedative Drugs</td>
<td>0.008</td>
<td>0.031</td>
<td>0</td>
<td>0</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

Note: Safety was not collected for the control group. NA = comparison not applicable due to lack of intervention use in control group. Please collect average number of patient days.

**IMPLICATIONS**

- **WE MUST ASSESS EARLY:** Prevention is better—than letting the cat out of the bag. Identifying high-risk patients and implementing strategies has solid evidence to prevent delirium.
- **WE NEED MORE SENSITIVE COGNITIVE MEASURES WITH DSD—MEMORY, ATTENTION, EXECUTIVE FUNCTION**
- **MANY patients with dementia come into acute care with delirium—25% in our END-DSD study**
- **DELIRIUM IS TREATABLE BUT INTERVENTIONS MAY NEED TO START EARLIER AND BE TAILORED WITH SMART DESIGNS:** An early delirium diagnosis and treatment of the underlying cause(s) is critical.
CONSIDER ROLE THAT CONTEXT PLAYS

- Address translation and implementation issues—testing these in diverse settings—delirium interventions tested in AMC often do not work well in community settings—in the real world—need use of implementation frameworks (Rycroft-Malone, 2013).
- Most older adults receive care in settings with little or no geriatric expertise—we must consider the ROLE OF CONTEXT in intervention design.

RESERVE for DSD*

- RESERVE For Delirium Superimposed on Dementia (DSD) is an ongoing, five-year clinical trial completed 2015
- Purpose: to test the efficacy of cognitive stimulation for resolving delirium in persons with dementia subsequent to a hospitalization.


Hypothesis

Compared to participants with DSD who receive usual care, participants who receive RESERVE-DSD will have:
- decreased severity and duration of delirium
- greater gains in attention, orientation, memory, and executive functioning
- greater gains in physical function

We also evaluate potential moderators of intervention efficacy (cognitive lifestyle and APOE status).

Describe the costs associated with RESERVE-DSD.

Procedure

- Participants recruited at time of admission to one of 8 SNFs in Central or Northeastern Pa.
- 65 years of age or older; community-dwelling
- Dx of dementia (Modified Blessed Dementia Rating Scale (3 or greater) & CDR (0.5 to 2.0)
- Delirium (Confusion Assessment Method (CAM) and Montreal Cognitive Assessment (MoCA)
- All dementia and delirium diagnoses were adjudicated by panel of 3 experts.

Cognitively Stimulating Activities To Do at the Bedside

- Word or object searches
- Crossword puzzles
- Name that tune
- Identify sounds
- Sorting objects
- Best if individualized to interests, "PRESCRIBED"
- & targeted to current mental status areas—attention, thinking, memory...

Measures

Daily (up to 30 days) measures of:

- Attention: Digit Span Forward and Backward
- Memory & Orientation: MoCA
- Executive function: CLOX
- Delirium severity: CAM & MoCA attention item
- Physical function: Barthel Index

APOE genotype determined by extracting DNA from buccal swabs
In patients with DSD, global cognition worsens at an increased rate over time. Even the small improvement we observed in executive function may be notable.

We found improvement in visual-spatial skills—important for hazard perception. Impacting executive function and constructional praxis has implications for clinical practice as these higher-order functions have importance for independent living.

The ability to be transitioned more quickly to a lower-level of care is cost saving.

**RESERVE RESULTS**

**Table 2. Cognitive and Physical Function Outcomes by Group**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Intervention</th>
<th>Control</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attention</td>
<td>7.90 [0.14]</td>
<td>7.57 [0.14]</td>
<td>0.07</td>
</tr>
<tr>
<td>Memory</td>
<td>0.90 [0.06]</td>
<td>0.90 [0.06]</td>
<td>0.88</td>
</tr>
<tr>
<td>Observation</td>
<td>3.01 [0.12]</td>
<td>3.29 [0.12]</td>
<td>0.15</td>
</tr>
<tr>
<td>Executive Function CLON 1</td>
<td>6.99 [0.02]</td>
<td>7.09 [0.02]</td>
<td>0.03</td>
</tr>
<tr>
<td></td>
<td>0.12 [0.04]</td>
<td>0.14 [0.05]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.13 [0.04]</td>
<td>0.15 [0.05]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.14 [0.05]</td>
<td>0.15 [0.05]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.15 [0.05]</td>
<td>0.16 [0.05]</td>
<td></td>
</tr>
<tr>
<td>Physical Function</td>
<td>4.14 [0.76]</td>
<td>4.07 [1.75]</td>
<td>0.57</td>
</tr>
</tbody>
</table>

*Data are expressed as Marginal (Least Squares) Mean [standard error] (95% CI) unless otherwise indicated.*

**IMPLICATIONS RESERVE STUDY**

- In patients with DSD, global cognition worsens at an increased rate over time. Even the small improvement we observed in executive function may be notable.

- We found improvement in visual-spatial skills—important for hazard perception. Impacting executive function and constructional praxis has implications for clinical practice as these higher-order functions have importance for independent living.

- The ability to be transitioned more quickly to a lower-level of care is cost saving.

**OUR STUDY CHALLENGES**

- Recruitment & Workflow
- Non-Drug, Rounds & Education
- Communication

- Culture
- Uptake versus EMR
- Who owns it?

- CAM Fit into front line
- Non-Drug Fit & adherence
- Why care about DSD?

**TAKE HOME MESSAGE**

- IT TAKES A VILLAGE (INTERDISCIPLINARY TEAM) BUT STRONGEST EVIDENCE IS FOR PREVENTION OF DELIRIUM BEFORE IT STARTS

- FIRST DO NO HARM—Use a behavioral, environmental, supportive, psychological or system change FIRST

- NURSES IN OUR STUDY WERE WILLING TO ASSESS FOR DELIRIUM, LIMIT THE USE OF DRUGS AND USE NON-DRUG APPROACHES

- INDIVIDUALIZED PERSON-CENTERED NON-DRUG APPROACH AS A FIRST LINE OF TREATMENT

**Gratitude & Acknowledgements**

Our sites, patients, investigators, study team and hospital staff

- Vanderbilt Medical Center
- Mount Nittany Health System
- Altoona Regional Health System
- Harvard, Aging Brain Center, Hebrew Senior Life
- Co-investigators—Dr. Lorraine Mion, Dr. Sharon Inouye, Dr. Ann Kolanowski
Vanderbilt University Team

“SKIP THE JARGON--instead tell stories--make personal and emotional connections” (Alan Alda, May 2013)

More Gratitude & Acknowledgements RESERVE

- Ann Kolanowski, RN PhD, FAAN
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- Mark Litaker PhD
- Doug Leslie PhD
- Keith Whitfield PhD
- Paula Mulhall, RN, BSN
- Jane McDowell, RN, MS, APRN
- Edward Marcantonio, MD, SM
- Jamie Guess, PhD