Kristoffer Rhoads, PhD
Clinical Neuropsychologist
Associate Professor, Department of Neurology
Memory and Brain Wellness Center
Harborview Medical Center/University of Washington School of Medicine
Seattle, WA 6/9/17
Presentation Overview

- **Context**
  - Regional Data
  - WA State Plan for AD

- **Clinical Integration**
  - Detection
  - Multidisciplinary management
  - Multimodal treatment
  - Resources

- **Future Directions**
“Should we begin to think of lifelong control of Aβ metabolism in the same way that we now think of lifelong control of cholesterol metabolism? The lesson of the DIAN study and of the study on the protective APP mutation is that reduction of the risk of late-life dementia requires a long-term and possibly lifelong effort.” S. Gandy MD

Progression of Alzheimer’s Disease

- **Presymptomatic**: ~5-20 years
- **Prodromal**: ~1-10 years
- **Mild Cognitive Impairment**: ~2-20 years
- **Dementia**:
Progression of Alzheimer’s Disease

Cognitive Function

Presymptomatic

MCI

gradual accumulation of neuropathology

Dementia

Years
2017 Facts and Figures

Projected Number of People Age 65 and Older (Total and by Age Group) in the U.S. Population with Alzheimer's Dementia, 2010 to 2050

- 5,500,000 Americans with Alzheimer's
- 10% general risk after age 65
- 65-74 = 3%
- 75-84 = 17%
- 82+ = 32%

Dementia, Healthcare & Economic Burden

- **Third most costly health condition in 2017**
  - Annual cost ~ $259 billion \( \text{Alzheimer's Association, Alzheimers Dement 2017} \)

- **$818 Billion worldwide in 2016** \( \text{Prince et al, 2016} \)
  - $604 Billion worldwide in 2010 \( \text{Wimo & Price 2010} \)
    - $238 billion/year = (T2DM+CAD+HTN+CVA)

- **83% of US workers obese or w/chronic condition**
  - > $1 trillion/year lost economic activity and productivity

- **$1 prevention = $5.60 savings** \( \text{RWJ Public Health Portfolio 2011} \)
Dementia, Healthcare & Economic Burden

**FIGURE 13**

Hospital Stays per 1,000 Medicare Beneficiaries Age 65 and Older with Specified Coexisting Medical Conditions, with and without Alzheimer’s or Other Dementias, 2014

<table>
<thead>
<tr>
<th>Condition</th>
<th>With Alzheimer’s or other dementias</th>
<th>Without Alzheimer’s or other dementias</th>
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</thead>
<tbody>
<tr>
<td>Congestive heart failure</td>
<td>804</td>
<td>753</td>
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<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>791</td>
<td>590</td>
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<tr>
<td>Chronic kidney disease</td>
<td>772</td>
<td>576</td>
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<td>Coronary artery disease</td>
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<td>475</td>
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<tr>
<td>Stroke</td>
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<td>550</td>
</tr>
<tr>
<td>Diabetes</td>
<td>678</td>
<td>386</td>
</tr>
<tr>
<td>Cancer</td>
<td>682</td>
<td>392</td>
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</table>

<table>
<thead>
<tr>
<th>Medical Condition by Alzheimer’s/Dementia (A/D) Status</th>
<th>Average Per-Person Medicare Payment</th>
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<tbody>
<tr>
<td></td>
<td>Total Medicare Payments</td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td></td>
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<tr>
<td>With A/D</td>
<td>$26,223</td>
</tr>
<tr>
<td>Without A/D</td>
<td>16,356</td>
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<tr>
<td>Diabetes</td>
<td></td>
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<tr>
<td>With A/D</td>
<td>25,385</td>
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<tr>
<td>Without A/D</td>
<td>14,014</td>
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<tr>
<td>Congestive heart failure</td>
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<tr>
<td>With A/D</td>
<td>28,773</td>
</tr>
<tr>
<td>Without A/D</td>
<td>24,412</td>
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<tr>
<td>Chronic kidney disease</td>
<td></td>
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<tr>
<td>With A/D</td>
<td>28,002</td>
</tr>
<tr>
<td>Without A/D</td>
<td>20,077</td>
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<tr>
<td>Chronic obstructive pulmonary disease</td>
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<tr>
<td>With A/D</td>
<td>27,797</td>
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<tr>
<td>Without A/D</td>
<td>18,962</td>
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<tr>
<td>Stroke</td>
<td></td>
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<tr>
<td>With A/D</td>
<td>26,608</td>
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<tr>
<td>Without A/D</td>
<td>19,169</td>
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<tr>
<td>Cancer</td>
<td></td>
</tr>
<tr>
<td>With A/D</td>
<td>25,207</td>
</tr>
<tr>
<td>Without A/D</td>
<td>15,987</td>
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*This table does not include payments for all kinds of Medicare services, and as a result the average per-person payments for specific Medicare services do not sum to the total per-person Medicare payments.

Created from unpublished data from the National 5% Sample Medicare Fee-for-Service Beneficiaries for 2014.
THE SILVER TSUNAMI IS COMING!
SAVE SENIOR AND DISABILITY
COMMUNITY SERVICES!
Alzheimer’s in Washington State

- 100,000 cases in WA
  - 40% increase by 2025

- 3rd leading cause of death
  - 3rd highest rate in the US
  - Mortality rate = 47.4

- Who provides care?
  - 335,000 unpaid caregivers
  - 382,000,000 hours = $4.83 billion
  - $227 billion in additional health care costs

Alzheimer’s Washington State Plan

• October 2013 - Governor’s Aging Summit
• February 2014 - SSB6124
• July 2014 - AD Working Group
• January 2016 - Plan released
• February 2016 - Plan accepted by Senate
• April 2016 - Dementia Action Collaborative
• January 2017 - First “products” released & Bree Collaborative Meeting
Plan Development

• Goals – broad visionary statements
• Strategies – high level plans to achieve the goals
• Recommendations – specific responses or actions
A Phased Approach

Recommendations identified by implementation time...

• Short-term: within 2 years
• Mid-term: 3-4 years
• Long-term: 5 years or more

...and the likely need for additional resources

• No additional resources needed
• Additional funding needed
• Additional legislation needed
Aspirational Goals

1. Increase public awareness
2. Prepare communities
3. Ensure well-being and safety
4. Ensure family caregiver supports
5. Identify dementia early and provide dementia-capable, evidence-based health care
6. Ensure dementia-capable long-term services and supports
7. Promote innovation and research
Dementia Action Collaborative

• Public-private partnership
• 37 Stakeholders
  • Persons with dementia
  • Family caregivers
  • Medical providers, clinicians, researchers
  • Legislators
  • DSHS, HCA, DOH
  • Alzheimer’s support organizations
• Subcommittee and Project Team Members
The DAC at Work

• Priorities in 2016

  - Focus on what can be done through heightened collaboration with existing resources
  - Sustain momentum and awareness by engaging partners (JLEC and others)
Recommendations in Motion – 2016
Public Awareness and Community Readiness Subcommittee

• Develop a website “point of access” portal
• Compile educational materials about safety
• Identify elements of dementia-friendly communities
• Inform and educate about healthy aging and brain health
Recommendations in Motion - 2016
Long-Term Services and Supports

• Develop a “roadmap” for family caregivers
• Expand and promote early stage groups
• Identify and engage leaders of diverse populations to explore needs
• Identify and promote existing models of care coordination
Recommendations in Motion – 2016
Health and Medical Subcommittee

• Convene expert panel to identify and endorse evidence-based standards for diagnosis, treatment, supportive care, and advanced planning
• Identify and recommend validated cognitive screening tools
• Promote understanding and effective use of Medicare Annual Wellness Visit
Dementia Action Collaborative

• Public-private partnership

• 37 Stakeholders
  - Persons with dementia
  - Family caregivers
  - Medical providers, clinicians, researchers
  - Legislators
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• Subcommittee and Project Team Members
**Aspirational Goals**

1. Increase public awareness
2. Prepare communities
3. Ensure well-being and safety
4. Ensure family caregiver supports
5. Identify dementia early and provide dementia-capable, evidence-based health care
6. Ensure dementia-capable long-term services and supports
7. Promote innovation and research
5. **Identify dementia early, and provide dementia-capable, evidenced-based health care.**

   A. Promote early detection, diagnosis and treatment.
      1. Identify and recommend validated cognitive screening tools

   B. Identify and endorse a set of evidenced-based standards of care for dementia to promote high quality health care for people with dementia in Washington State.
      1. Convene expert panel to identify and endorse evidence-based standards for diagnosis, treatment, supportive care, and advanced planning

   C. Promote understanding and effective use of Medicare Annual Wellness Visit
To align care delivery with existing evidence-based standard of care for diagnosis, treatment, supportive care, and advance care planning within primary care for patients with Alzheimer’s disease or other dementias and their families and caregivers while decreasing variation in quality of treatment across the state of Washington.
Bree Collaborative: Workgroup Members

- **Chair: Kristoffer Rhoads, PhD**, Memory and Brain Wellness Center, UW Medicine
- **Kimiko Domoto-Reilly, MD**, Alzheimer's Research Center, UW Medicine
- Richard Furlong, MD, Primary Care, Virginia Mason Medical Center
- **Barak Gaster, MD**, Professor of Medicine, UW Medicine
- Kelly Green, MSW, Social Worker, Evergreen Health
- Debbie Hunter, Family Caregiver
- Nancy Isenberg, MD, MPH, FAAN, Neurologist, Virginia Mason Medical Center
- Arlene Johnson, Family Caregiver
- Kerry Jurges, MD, Primary Care, Confluence Health
- Eric Larson, MD, MPH, Vice President for Research and Health Care Innovation, Kaiser Foundation Health Plan of Washington
- Todd Larson, Family Caregiver
- Myriam Marquez, Patient Advocate
- Shirley Newell, MD, Chief Medical Officer, Aegis Living
- **Darrell Owens, DNP, ARNP**, Clinic Chief, Director, University of Washington Outpatient Primary, Palliative and Supportive Care Program
- **Tatiana Sadak, PhD, ARNP**, UW Medicine
- Bruce Smith, MD, Medical Director, Regence Blue Shield
• **Case Detection**
  – Importance of early detection
  – At risk populations
  – Opportunities
  – Clinical Pathways

• **Diagnosis**

• **Referrals**
  – Consultation
    • Rural care settings

• **Interventions**
  – “Now what?”
Propose two-step process: initial test and follow-up appointment

Current State: Issues with memory and cognition are addressed if they are brought up by the patient or family member(s). The primary care provider may be unsure as to screening tools, Federal or State requirements, or next steps if a patient or family members brings up concerns with memory and not feel comfortable discussing cognitive issues.

Steps Toward Goal: Screening for at-risk populations, clear clinical pathway for people who screen positive including through the Medicare Annual Wellness visit.

Goal for Usual Care: Healthy adults with mild cognitive impairment (MCI) or dementia are detected at an early stage, targeting early evidence-based interventions. Primary care providers are clear on the value of early detection as well as requirements and feel supported and comfortable truthfully discussing cognitive issues.
Operationalizing the goals (TO BE ALIGNED WITH DEMENTIA ACTION COLLABORATIVE POSITION PAPER)

- Clear guidelines on how to make the diagnosis and how to discuss this with the patient and family.
- Clear expectation that the provider will truthfully discuss the diagnosis with the patient and family.
- Cognitive screening by direct observation with due consideration of information obtained via beneficiary reports and concerns raised by family members, friends, caretakers, or others is assessed as part of the Medicare Annual Wellness Visit.
- Using a standard tool
- Specific elements to include in a work-up for people exhibiting symptoms- what is the evidenced-bases standard?
• **Current State:** Clinician may diagnose dementia or may refer to neurologist for diagnosis (depends on factors like patient complexity, clinician’s comfort level, and/or available resources)

• **Steps Toward Goal:** Primary care provider, who has an existing relationship with the patient and will be following them over time, diagnoses and treats the patient. Primary care provider involves a neurologist as needed for consultation and support or for differential diagnosis. Patients and families are offered information about available community supports like Alzheimer’s Association services.

• **Goal for Usual Care:** Patient and family members receive coordinated care as part of an interdisciplinary team. This may include support staff in primary care provider office, specialists, and community partners.
• **Current State:** Significant variability in interventions and support offered after diagnosis and throughout the disease. Patients and families are not consistently informed of treatment options, community services, or an answer to the “I have a diagnosis, what do I do now?” question.

• **Steps Toward Goal:** There is a clear pathway for interventions and supports to offer at different stages throughout the disease process.

• **Goal for Usual Care:** Evidence-based interventions are initiated upon diagnosis. The patient is able to participate in a dementia-friendly health care system and community throughout the disease, etc.
• Public Input Survey
  – N= 2,259
  – 55% indicated difficulty getting a diagnosis
  – 72% indicated their PCP as first point of contact/information
  – 20% were given no information
  – 14% received information about resources
  – 7% actively referred to agencies
Basic Assessment of Dementia

- Interview/History
- Physical exam
- Neurological exam
- Cognitive assessment
- Functional status
- Depression assessment
- Laboratory
- Neuropsychological evaluation
- Neuroimaging

- Repeat if unclear
  - 6-12 months
Assessment: History

- Context and Premorbid abilities
  - Education, occupation, function
  - Change from previous levels of function

- Onset & Progression
  - Gradual vs. datable, insidious vs. sudden
  - Rate, direction, fluctuations

- Impact on functioning
  - Occupational, IADLs, ADLs, social, relational, etc

- Sleep and related disorders
  - Quantity, quality, medications, supplements

- Save the sensitive questions until rapport has been built
  - Alcohol and marijuana
  - Driving

- Provide a venue for independent information from a collateral

- Repeat
  - Within, between, across visits

- Sets the stage for screening
Assessment: Cognitive Screening

- In primary care settings, only <50% of patients with dementia are diagnosed
  - Critical information for other providers/care team members, esp. if the PCP is unavailable

- Better diagnostic aids are needed
  - Accurate
  - Brief
  - Cost effective

ADWG State Plan

• Provider Input Survey
  – N= 247
  – 77% indicated screening as very important
    • 57% have organizational guidelines
  – 46% unaware of cognitive screening component to AWV
  – 55% screen when clinical concern
    • 20% screen annually
  – 65% use MMSE
  – 57% cite time as main barrier
Cognitive Screening Measures

- **MMSE** *(Folstein et al., 1975)*
  - Sensitivity = 66-73%
  - Specificity = 87-92%

- **Mini-Cog** *(Borsen et al., 2000)*
  - Sensitivity = 65-85%
  - Specificity = 87-91%

- **MoCA** *(Nazreddine et al., 2005)*
  - Sensitivity = 90-100%
  - Specificity = 87-90%
Virginia Mason Cognitive Screen

- Capitalizes on active ingredients
  - Recall, clock, fluency
- 3 minutes
- Can be administered by MA/RN
- Part of larger provider toolkit
  - Triage tool
  - Order sets
  - Imaging
  - Referrals
Screening: VMCS

• VM validation sample (N=150)
  • GIM
  • Neurology, referred by GIM

• Age 55+
  • Vascular risk factors
  • Subjective/objective memory concerns

• Consensus diagnosis
  • Labs, neuro, imaging, neuropsych
Screening: VMCS

- Equivalent sensitivity in AD

Minicog = .69
MoCA = .87
VMCS = .85
Screening: VMCS

- Equivalent sensitivity in all dementia (AD, VaD, mixed)

Minicog = .72
MoCA = .86
VMCS= .88
Screening: VMCS

- Equivalent sensitivity in any impairment (MCI +)

Minicog = .64
MoCA = .78
VMCS = .80
Detection – Now What?

- Roll out integration into Medicare AWV
- GIM Dementia Care Pathway
  - Follow up discussions/counseling, esp. if patient/family are not ready for referral
  - Triggers labs, additional evaluations incl. driving
  - Order sets, minimize/avoid benzodiazepines, antihistamines, anticholinergics, opioids, alcohol
  - Referral to specialty services
- Validation in specialty clinic populations
  - Complex spine surgery
  - Orthopedic surgery prescreen
Cognitive Impairment Care Planning

- **G0505 Code**
  - Cognition-focused evaluation
  - Medical decision making
    - Moderate or high complexity
  - Functional assessment
  - Decision-making capacity
  - Standardized dementia staging
  - Medication reconciliation and review
  - Evaluation of neuropsychiatric symptoms
  - Evaluation of safety
  - Caregiver assessment
  - Advance care planning
  - Palliative care needs
  - Creation and review of a care plan

- **RVU = 6.64**
- **Physician work = 3.44**
- **CMS average payment = $238.30**
Laboratory Assessment

- **Blood**
  - CBC, chemistry
  - TSH
  - B12, folate
  - Vitamin D
  - Syphilis serology

- **Genetic**
  - Perhaps & only with counseling

- **CSF**
  - $\alpha$-tau
Neuroimaging

- MRI = most sensitive/robust measure of rate of change
  - AD, MCI and healthy controls
  - MRI Volumetric analysis
    - Hippocampus, ventricles, comparable
    - Atrophy = common outcome measure in AD clinical trials

- [F18]flouro-deoxyglucose (FDG)–PET
- SPECT
- Pittsburgh compound B (PiB)-PET
- Florbetapir (Amyvid) imaging
  - FDA approved in April 2012
  - Not conclusive
  - ~15% of patients with dementia are difficult to diagnose
  - Need specialized training to read Amyvid studies for
  - Sensitivity 92% ; specificity 95%

- Diffusion Tensor Imaging
MRI Volumetric Analysis

• Significant difference in hippocampal volumes (HV) between control, MCI, and AD
  – MCI HV average 86% of normal control HV
  – AD HV average 78% of normal control HV

• Annual HV loss: Brain. 2009 Apr; 132(4): 1067–1077
  – Normal 0.8% / yr
  – MCI 2.6% / yr
  – AD 4.4% / yr
  – Modulated by genetics and biomarkers
MRI Volumetric Analysis

**NeuroQuant®**

*Age-Related Atrophy Report*

**Patient Information**

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<thead>
<tr>
<th>Patient ID:</th>
<th>Patient Name:</th>
<th>Sex:</th>
</tr>
</thead>
</table>

**Accession Number:** 10086262  
**Referring Physician:** Grabowski Jr, Thomas J MD  
**Exam Date:** 2016/09/16 11:57:59 AM

**Morphometry Results**

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<tr>
<th>Brain Structure</th>
<th>Volume (cm³)</th>
<th>% of ICV (5%-95% Normative Percentile*)</th>
<th>Normative Percentile*</th>
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<tbody>
<tr>
<td>Hippocampi</td>
<td>5.51</td>
<td>0.33 (0.45-0.60)</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>Lateral Ventricles</td>
<td>65.10</td>
<td>3.92 (1.09-3.82)</td>
<td>&gt; 99</td>
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<tr>
<td>Inferior Lateral Ventricles</td>
<td>4.66</td>
<td>0.28 (0.11-0.28)</td>
<td>94</td>
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</table>

**Age-Matched Reference Charts**

- **l & R Hippocampus**
- **l & R Inferior Lateral Ventricle**
FDG-PET Normal vs AD
Amyvid Imaging
Neuropsychological Assessment

- **When is it useful?**
  - Neurological differentials
  - Screening is normal, but patient is not
  - Identification of strengths/weaknesses
    - Sets the stage for rehab/treatment
  - Disease progression
  - Medication/treatment response
  - Questions about function/IADLs
  - Capacity assessment
    - Driving
    - Testamentary
    - Decision making
Prevention and Interventions

• Treatment of Midlife Modifiable Risk Factors
  • Diabetes
  • Hypertension
  • Hypercholesterolemia
  • Obesity
Intervention Targets in AD

Cognitive Function

Presymptomatic

MCI

Dementia

Presymptomatic / MCI

gradual accumulation of neuropathology

decrease neuropathology
Prevention and Interventions

• Treatment of Modifiable Risk Factors
  • Cardiovascular
  • Sedentary lifestyle
  • Sleep disorders/disruption
  • Alcohol
• Cardiovascular Exercise
• Cognitive Activation and Rehabilitation
• Dietary Interventions
• Meditation/Mindfulness-Based Stress Reduction
• Community Engagement and Socialization

• Early interdisciplinary involvement
What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?
Exercise training increases size of hippocampus and improves memory

Kirk I. Erickson\textsuperscript{a}, Michelle W. Vose\textsuperscript{b,c}, Ruchika Shaurya Prakash\textsuperscript{d}, Chandramallika Basak\textsuperscript{e}, Amanda Szabo\textsuperscript{f}, Laura Chaddock\textsuperscript{b,c}, Jennifer S. Kim\textsuperscript{b}, Susie Heo\textsuperscript{b,c}, Heloisa Alves\textsuperscript{b,c}, Siobhan M. White\textsuperscript{f}, Thomas R. Wojcicki\textsuperscript{f}, Emily Mailey\textsuperscript{f}, Victoria J. Vieira\textsuperscript{f}, Stephen A. Martin\textsuperscript{f}, Brandt D. Pence\textsuperscript{f}, Jeffrey A. Woods\textsuperscript{f}, Edward McAuley\textsuperscript{b,f}, and Arthur F. Kramer\textsuperscript{b,c}\textsuperscript{1}

\textsuperscript{a}Department of Psychology, University of Pittsburgh, Pittsburgh, PA 15260; \textsuperscript{b}Beckman Institute for Advanced Science and Technology, and \textsuperscript{c}Department of Kinesiology and Community Health, University of Illinois, Champaign-Urbana, IL 61801; \textsuperscript{d}Department of Psychology, University of Illinois, Champaign-Urbana, IL 61820; \textsuperscript{e}Department of Psychology, Ohio State University, Columbus, OH 43210; and \textsuperscript{f}Department of Psychology, Rice University, Houston, TX 77251

A Hippocampus

B Caudate Nucleus

C Thalamus
Aerobic Exercise Reduces Tau Protein in Older Adults with Mild Cognitive Impairment (Baker et al., 2015)

- 65 sedentary adults
- 55-89 years old

- 6-month randomized controlled trial
  - Aerobic exercise (70-80% max HR) vs stretching (<35%)
  - 45-60 minutes four times per week

- Reduced CSF tau
  - Most prominent in age 70+
- Improved perfusion in frontal and temporal lobes
- Improved memory, attention and executive function
Review

The effect of physical activity on cognitive function in patients with dementia: A meta-analysis of randomized control trials

C. Groot\textsuperscript{a,b,*}, A.M. Hooghiemstra\textsuperscript{a,c}, P.G.H.M. Raijmakers\textsuperscript{b}, B.N.M. van Berckel\textsuperscript{b}, P. Scheltens\textsuperscript{a}, E.J.A. Scherder\textsuperscript{c}, W.M. van der Flier\textsuperscript{a,d}, R. Ossenkoppele\textsuperscript{a,b}

\begin{table}[h]
\centering
\begin{tabular}{llll}
\hline
Study & SMD & CI & N \\
\hline
Arcoverde (2014) & 0.84 & -0.02-1.70 & 20 \\
Bossers (2015) \textsuperscript{[1]} & 0.45 & -0.01-0.92 & 73 \\
Bossers (2015) \textsuperscript{[2]} & 0.07 & -0.40-0.53 & 72 \\
* Cheng (2014) & -0.34 & -0.80-0.12 & 74 \\
Christofoletti (2008) & 0.06 & -0.68-0.80 & 29 \\
Cott (2002) & 0.05 & -0.48-0.58 & 55 \\
Eggermont (2009a) & 0.04 & -0.46-0.53 & 61 \\
Eggermont (2009b) & 0.07 & -0.32-0.46 & 97 \\
Hokkanen (2008) & 0.89 & 0.13-1.66 & 29 \\
Holthoff (2015) & 0.34 & -0.38-1.06 & 30 \\
Kemoun (2010) & 0.89 & 0.15-1.63 & 31 \\
Kwak (2008) & 1.03 & 0.27-1.79 & 30 \\
* Miu (2008) & -0.36 & -0.91-0.19 & 52 \\
Steinberg (2009) & 0.26 & -0.46-0.98 & 27 \\
Stevens (2006) & 0.98 & 0.38-1.59 & 45 \\
* Venturelli (2011) \textsuperscript{†} & 3.00 & 1.75-4.25 & 21 \\
Vreugdenhil (2012) & 0.75 & 0.11-1.40 & 40 \\
Winckel v.d. (2004) & 1.03 & 0.18-1.88 & 25 \\
Yágüez (2011) & 0.84 & -0.65-0.87 & 27 \\
Overall random & 0.42 & 0.23-0.62 & 691 \\
\hline
\end{tabular}
\end{table}
MIND diet associated with reduced incidence of Alzheimer’s disease

Martha Clare Morris, Christy C. Tangney, Yamin Wang, Frank M. Sacks, David A. Bennett, Neelum T. Aggarwal

- N = 923
- Age 58-98
- 4.5 years
- DASH + Mediterranean
  - One glass of wine
- 53% reduction in incidence
Prevention and Interventions

• **Alcohol**
  - 1-2 **servings** a day for men; 1 for women
  - Red wine
  - Grape seed extract
  - Pomegranate juice
  - **Minimal if any alcohol use once impairments evident**

• **Smoking CESSATION**
Computerized Cognitive Training in Older Adults With Mild Cognitive Impairment or Dementia: A Systematic Review and Meta-Analysis


Overall Cognitive Outcomes: Mild Cognitive Impairment

<table>
<thead>
<tr>
<th>Study</th>
<th>Hedges' g (95% CI)</th>
<th>Weight (%)</th>
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</thead>
<tbody>
<tr>
<td>Kim et al. (66)</td>
<td>0.47 (−0.24 to 1.18)</td>
<td>4.59</td>
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<tr>
<td>Roccini et al. (51)</td>
<td>0.38 (−0.26 to 1.03)</td>
<td>5.42</td>
</tr>
<tr>
<td>Barnes et al. (29)</td>
<td>0.09 (−0.47 to 0.65)</td>
<td>7.41</td>
</tr>
<tr>
<td>Finn and McDonald (48)</td>
<td>0.66 (−0.88 to 0.99)</td>
<td>2.64</td>
</tr>
<tr>
<td>Herrera et al. (56)</td>
<td>1.23 (0.33 to 2.12)</td>
<td>2.92</td>
</tr>
<tr>
<td>Wittelsberger et al. (54)</td>
<td>0.17 (−0.58 to 0.93)</td>
<td>4.02</td>
</tr>
<tr>
<td>Tannanas et al. (47)</td>
<td>0.40 (−0.08 to 0.88)</td>
<td>10.04</td>
</tr>
<tr>
<td>Hughes et al. (57)</td>
<td>0.19 (−0.56 to 1.04)</td>
<td>3.19</td>
</tr>
<tr>
<td>Fiascone Singh et al. (43)</td>
<td>−0.06 (−0.61 to 0.50)</td>
<td>7.55</td>
</tr>
<tr>
<td>Fiascone Singh et al. (43)</td>
<td>0.06 (−0.48 to 0.61)</td>
<td>7.90</td>
</tr>
<tr>
<td>Finn and McDonald (49)</td>
<td>0.21 (−0.57 to 0.99)</td>
<td>3.81</td>
</tr>
<tr>
<td>Barbac et al. (44) study 2</td>
<td>0.18 (−0.21 to 0.56)</td>
<td>15.82</td>
</tr>
<tr>
<td>Barcolos et al. (53)</td>
<td>1.05 (0.02 to 2.08)</td>
<td>2.19</td>
</tr>
<tr>
<td>Gooding et al. (50) study 1</td>
<td>0.68 (−0.07 to 1.43)</td>
<td>4.16</td>
</tr>
<tr>
<td>Gooding et al. (50) study 2</td>
<td>0.77 (0.02 to 1.52)</td>
<td>4.11</td>
</tr>
<tr>
<td>Hagavos et al. (45)</td>
<td>0.65 (0.19 to 1.10)</td>
<td>11.27</td>
</tr>
<tr>
<td>Lin et al. (67)</td>
<td>0.74 (−0.15 to 1.62)</td>
<td>2.99</td>
</tr>
<tr>
<td>Overall</td>
<td>0.35 (0.20 to 0.51)</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Tests for heterogeneity: χ²=15.55, df=16, p=0.49, I²=0
Test for overall random effect: Z=−4.554, p<0.001

Overall Cognitive Outcomes: Dementia

<table>
<thead>
<tr>
<th>Study</th>
<th>Hedges' g (95% CI)</th>
<th>Weight (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heiss et al. (58)</td>
<td>−0.01 (−0.65 to 0.64)</td>
<td>10.86</td>
</tr>
<tr>
<td>Tarraga et al. (59)</td>
<td>0.11 (−0.58 to 0.80)</td>
<td>9.96</td>
</tr>
<tr>
<td>Galante et al. (32)</td>
<td>−0.13 (−1.26 to 1.00)</td>
<td>4.50</td>
</tr>
<tr>
<td>Optale et al. (51)</td>
<td>1.00 (0.27 to 1.73)</td>
<td>9.08</td>
</tr>
<tr>
<td>Fernandez-Calvo et al. (55)</td>
<td>1.13 (0.38 to 1.89)</td>
<td>8.75</td>
</tr>
<tr>
<td>Boiler et al. (42) study 1</td>
<td>0.02 (−0.92 to 0.96)</td>
<td>6.20</td>
</tr>
<tr>
<td>Boiler et al. (42) study 2</td>
<td>0.16 (−0.78 to 1.10)</td>
<td>6.15</td>
</tr>
<tr>
<td>Man et al. (50)</td>
<td>0.48 (−0.14 to 1.11)</td>
<td>11.40</td>
</tr>
<tr>
<td>Lee et al. (60)</td>
<td>−0.06 (−1.06 to 0.96)</td>
<td>5.38</td>
</tr>
<tr>
<td>Barbac et al. (44) study 1</td>
<td>−0.06 (−0.49 to 0.38)</td>
<td>17.50</td>
</tr>
<tr>
<td>Zhuang et al. (33)</td>
<td>0.14 (−0.54 to 0.62)</td>
<td>10.23</td>
</tr>
<tr>
<td>Overall</td>
<td>0.26 (0.01 to 0.52)</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Tests for heterogeneity: χ²=13.60, df=10, p=0.192, I²=26.48
Test for overall random effect: Z=−2.00, p=0.045
Palliative Care and Dementia

Figure 5: Percentage Changes in Selected Causes of Death (All Ages) Between 2000 and 2014

- Breast cancer: -1%
- Prostate cancer: -9%
- Heart disease: -14%
- Stroke: -21%
- HIV: -54%
- Alzheimer's disease: 89%

Palliative Care and Dementia

Integrated Palliative Care Framework

Disease-Modifying Therapy
(curative, or restorative intent)

Hospice

Bereavement

Diagnosis  Time  Death

NHWG. Adapted from work of the Canadian Palliative Care Association and Frank Ferris, MD.
Palliative Care and Dementia

Merel, Clin Geri Med 2014
Back to the Basics

• Need to encourage discussion and manage even the basics of end of life care
  – Feeding tubes in advanced dementia
  – Advanced directives
    • Issue of capacity
  – POLST
  – Living will
  – Durable Power of Attorney
  – Estate issues
  – Elder law referrals
UW Memory and Brain Wellness

- A consortium of
  - Alzheimer Disease Research Center (NIA)
  - Pacific Northwest Udall Center (NINDS)
  - Memory and Brain Wellness Clinic

- Links state-of-the-art clinical evaluation and care with research programs in Alzheimer’s and related disorders
MBWC – Interdisciplinary Approach

- Neurology
- Geriatrics
- Psychiatry
- Neurogenetics
- Neuropsychology
- Nursing
- Social Work
Referrals & Orders

- Neurodegenerative (possible to suspected)
  - No primary stroke, seizure, TBI w/in 6 mos

- Diagnostic uncertainty/discomfort
  - LBD, FTD, complex mixed

- Young onset (age<65)

- Screened for "usual suspects"
  - Lipids, CBC, CMP, A1C
  - B12 (maybe MMA, Homocysteine), folate, vit D
  - TSH
  - Sleep
  - Alcohol

- If imaging, MRI with volumetric analysis
Representative Services

• Data Gathering visit
  – VS- full set including weight and SpO₂
  – Physician evaluation
  – Social work consultation

• Diagnostic tests (MRI, neuropsych, labs, LP, PET)

• Family Visit
  – Physician feedback
  – ARNP/Social Worker

• Managed follow up/partnership with PCP
Future Directions

- **GIM Integration**
  - MBWC-Primary Care Liaison Team
  - Annual Medicare Wellness Visit
  - Neighborhood Clinics

- **Group interventions for MCI/early dementia**
  - HABIT
  - Dementia-friendly Intergenerational Arts
  - Exercise
  - MBSR

- **Outcome Measurement**
  - Dementia Performance Measurement Set (AAN, 2011)
Resources

• Dementia Action Collaborative/State Plan
  – https://www.dshs.wa.gov/altsa/stakeholders/alzheimer-s-state-plan
Driving and Dementia
Kristoffer Rhoads, PhD
Associate Professor
Department of Neurology
Memory and Brain Wellness Center
Harborview Medical Center/University of Washington School of Medicine

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Learning Objectives
By the end of this lecture, you should be able to:

- Identify the most prevalent cognitive risk factors threatening driving skills.
- Describe screening measures for cognitive function with combined ecological validity and suitability for primary and specialty care settings.
- Identify resources and referral processes for further evaluation and additional community mobility services.
Resources

- Alzheimer Association (www.alz.org)

- Momentia Seattle (www.momentiaseattle.org)

- Areas on Aging (http://www.agingwashington.org)

- UW MBWC (http://depts.washington.edu/mbwc/)
Thank you for your attention!

Questions?
Memory and Brain Wellness Center

https://depts.washington.edu/mbwc/
Harborview Medical Center
325 9th Ave., 3rd Floor West Clinic
Seattle, WA 98104
Phone 206-744-3045
Fax 206-744-8527
krhoads@uw.edu
References/Resources

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