Medical Update on Alzheimer's Disease: Prevention to Palliation

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February 15th, 2017
Presentation Overview

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

- **Updates**
  - Screening
  - Multidisciplinary management
  - Multimodal treatment
  - Palliative care issues

- **Future Directions**
Increased Life Expectancy and Epidemic of Alzheimer’s

• 10,000 Americans reach 65 each day

• **Current life expectancy 78 years**
  – 47 years in 1900

• **Age** is single greatest risk factor for Alzheimer’s disease

• 80 million Baby Boomers (born 1946-1964)
Rethinking Memory Loss

• Inevitable consequence of aging
• Stigma
• Chronic disease model
• Prevention
• Rehabilitation
• Treatment
• Palliative care
“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

Dementia, Healthcare & Economic Burden

- Third most costly health condition in 2015
  - Annual cost ~ $226 billion
  - $172 billion in 2010  

- $604 Billion worldwide in 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


Wimo & Price 2010

RWJ Public Health Portfolio 2011
Dementia, Healthcare & Economic Burden

• **Major risk factor for critical patient safety issues**
  – Post-op delirium
  – Hospital delirium
  – Falls
  – Rapid readmission rates *Wimo & Price 2010*

  *More broadly family caregiver’s accelerated aging*

• **Increased area of focus for Accountable Care**
  – WA Alzheimer’s State Plan
  – Bree Collaborative
  – Puget Sound High Value Network
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

• Who provides care?
  – 324,000 unpaid caregivers
  – 369,000,000 hours = $4.485 billion
  – $200 billion in additional health care costs

Alzheimer’s Association. 2015 Alzheimer’s Disease Facts and Figures. Alzheimer’s & Dementia 2015;11(3)332+
Alzheimer’s Washington State Plan

- Local exponent of the National Alzheimer’s Plan
  - SSB 6124 (March 2014, adopted February 2016)
- Allocation of Medicaid/Medicare $$
- 44 members, 4 Subcommittees
  - Health and Medical
  - Long Term Supports & Service
  - Public Awareness/Outreach/Education
  - Public Health - Community Readiness

- ADWG (ADWG) Convened
  - Sep 2014
- Meetings of ADWG and Subcommittees
  - Sep 2014 - Sep 2015
- ADWG Determines Final Recommendations
  - Jul 2015
- Final Draft of Recommendations/Plan
  - Nov 2015
- Host Listening Sessions for Public
  - Mar 2015 - Apr 2015
- ADWG Hears Initial Recommendations from Subcommittees
  - May 2015
- Final Recommendations Ready/Posted for Public Comment
  - Sep 2015
- Planning & Workgroup Formation
  - May 2014 - Jun 2014
- Survey for Public
  - Nov 2014 - Dec 2014
- 4/15/2014 1/1/2016
Dementia Action Collaborative

A. Identify dementia early, and provide dementia-capable, evidenced based health care.


2. 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.

B. Promote research and innovation into the causes and effective interventions for dementia
• 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
• Provider Input Survey
  – N= 247
  – 77% indicated screening as very important
    • 57% have organizational guidelines
  – 46% unaware of cognitive screening component to AMWV
  – 55% screen when clinical concern
    • 20% screen annually
  – 65% use MMSE
  – 57% cite time as main barrier
Cognitive Screening

- In primary care settings, only <50% of patients with dementia are diagnosed

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

- Roll out integration into AWV
- Validation in specialty clinic populations
  - Complex spine surgery
  - Orthopedic surgery prescreen
- GIM Dementia Care Toolkit
  - Triggers labs, additional evaluations incl. driving
  - Order sets, minimize/avoid benzodiazepines, antihistamines, anticholinergics, opioids, alcohol
  - Referral to specialty services
• Barriers to early diagnosis
• Perceived lack of treatment options/benefit
• Complex medical comorbidities
• Behavioral issues
• Early intervention for risk reduction
• Limited efficacy of individual treatment components
Tao Porchon Lynch, 93 year old yoga master
Epigenetics in action…
MBWC – Interdisciplinary Approach

• Assessment and Treatment
  • Neurology
  • Geriatrics
  • Psychiatry
  • Neuropsychology
  • Nursing
  • Social Work
  • Rehabilitation Therapies
  • Referrals/Agency Partnerships
Holistic Evidence-Based Care

- Medication review/ LESS IS MORE
- Minimize deliriogenic medications
- Caregivers/Family support
  - Ongoing collaboration with care manager
- Behavioral & environmental treatments
- De-escalation strategies
- MBSR/CCT/Mind Body tools and technologies
- Motivational Enhancement and Interviewing
Motivational Enhancement

“What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?”
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
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
Cognitive Rehabilitation

• Restitution vs. Compensation
• Internal vs External Strategies
  • Encoding
    • Mnemonic
    • Chaining (forward/backward)
    • Chunking
    • Errorless learning
  • Storage
    • PQRST
    • Spaced retrieval
  • Retrieval
    • Cues/prompts
    • Recognition strategies
Cognitive Rehabilitation: Scaffolding

External devices include:

- Information display items
  - Clocks, calendars, digital photo frames
- Electronic reminders
  - Phones, pagers, pillboxes
- Location detection devices
  - Electronic tagging
- Way-finding
  - GPS, architectural design
- Electronic storage
  - PDA, mobile phone
- Diaries, organizers, Filofaxes
- Storage devices
Cognitive Training: NEURORACER

Anguera et al., Nature, 2013
Memory and Stress

... though recent work by Alia Crum and others may suggest mindset regarding stress matters see The Upside of Stress by Kelly McGonigal PhD.
## Meditation and the Brain

<table>
<thead>
<tr>
<th>Study</th>
<th>Intervention</th>
<th>n</th>
<th>Mean age ± SD</th>
<th>Experience with meditation</th>
<th>Loci with increased cortical thickness</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lazar et al. (2005)</td>
<td>Various</td>
<td>20</td>
<td>38.2 ± 6.7</td>
<td>9.1 ± 7.1 years, 6.2 ± 4 h per week</td>
<td>Anterior insula, parts of frontal lobe, auditory cortex in temporal lobe</td>
<td>Somato-sensory, auditory, and interceptive processes</td>
</tr>
<tr>
<td>Pagnoni and Cekic (2007)</td>
<td>Zen</td>
<td>13</td>
<td>37.2 ± 6.9</td>
<td>&gt;3 years per day</td>
<td>Putamen</td>
<td>Attention</td>
</tr>
<tr>
<td>Holzel et al. (2008)</td>
<td>Vipassana</td>
<td>20</td>
<td>34.1 ± 4.7</td>
<td>8.6 years, 2 h daily</td>
<td>Anterior insula, right hippocampus, left inferior temporal gyrus</td>
<td>Anterior insula – awareness of internal experience</td>
</tr>
<tr>
<td>Vestergaard-Poulsen et al. (2009)</td>
<td>Tibetan buddhism</td>
<td>10</td>
<td>55 ± 6.2</td>
<td>16.5 ± 5.1 years</td>
<td>Medulla oblongata, anterior cerebellum, superior, and inferior frontal gyrus</td>
<td>Breath control, resistance to stress, attention, calmness</td>
</tr>
<tr>
<td>Luders et al. (2009)</td>
<td>Various</td>
<td>22</td>
<td>53 ± 11.5</td>
<td>24 ± 12 years</td>
<td>Orbito-frontal cortex, right talamus, left inferior temporal gyrus</td>
<td>Regulation of emotions and sensory functions</td>
</tr>
<tr>
<td>Grant et al. (2010)</td>
<td>Zen</td>
<td>17</td>
<td>37.6 ± 10.9</td>
<td>&gt;1000 h</td>
<td>Anterior cingulate cortex, secondary somato-sensory cortex</td>
<td>Anterior cingulate cortex – adaptive control of behavior</td>
</tr>
<tr>
<td>Holzel et al. (2011)</td>
<td>MBSR</td>
<td>16</td>
<td>39 ± 4</td>
<td>0</td>
<td>Left hippocampus, posterior cingulate cortex, temporo-parietal junction, cerebellum</td>
<td>Learning, memory, regulation of emotions, empathy</td>
</tr>
<tr>
<td>Luders et al. (2013b)</td>
<td>Various</td>
<td>50</td>
<td>51.4 ± 12.8</td>
<td>20 years</td>
<td>Hippocampus, especially subiculum</td>
<td>Subiculum – regulation of stress</td>
</tr>
<tr>
<td>Grant et al. (2013)</td>
<td>Zen</td>
<td>18</td>
<td>37.1 ± 10.9</td>
<td>&gt;1000 h</td>
<td>Cingulo-fronto-parietal network</td>
<td>Attention</td>
</tr>
</tbody>
</table>

n, number of subjects, SD, standard deviation, MBSR, mindfulness-based stress reduction, IBMT, integrative body mind training.
Meditation and Alzheimer’s

• **Reduction of risk factors**
  – Hypertension (Anderson et al., 2008)
  – Cholesterol (Walton et al., 2004)
  – Depression (Beadreau, 2008)
  – Anxiety (Beadreau, 2008)

• **Improved perfusion** (Newberg et al, 2001)

• **Protected white matter networks** (Pagoni, 2007)

• **Inflammatory modulation** (Luders et al., 2013)

• **Decreased stress hormones** (Jacobs, 2013)

• **Downstream effects**
  – Alcohol?/craving
Meditation and Alzheimer’s


- 8 week meditation program
  - Relaxation (music) control
- N = 15
  - Normal control (n=7)
  - MCI (n=5)
  - AD (n=3)

- Improved perfusion
  - Prefrontal and auditory cortex
- Reduced perfusion (parietal)
- Improved cognition
  - Verbal fluency, divided/working attention, declarative memory
Meditation and AD

Newberg et al., 2010

Pre-Program Baseline

Post-Program Baseline

PFC

Ant Cingulate
Palliative Care and Dementia

Change in the Number of Deaths between 2000-2010

- Breast Cancer: 68%
- Prostate Cancer: -2%
- Heart Disease: -8%
- Stroke: -16%
- HIV: -23%
- Alzheimer's Disease: -42%

Source: Alzheimer's Association
Palliative Care and Dementia

Integrated Palliative Care Framework

Disease-Modifying Therapy
(curative, or restorative intent)

Palliative Care

Hospice

Bereavement

Diagnosis  Time  Death

NHWG. Adapted from work of the Canadian Palliative Care Association and Frank Ferris, MD.
Access to Hospice care

- Utilization of hospice low for persons with dementia
  - 18-22%

- Virtually all hospices provide care for persons with dementia

- Need is to manage the high symptom burden
  - Pain
  - Agitation
  - Shortness of breath
• Need to encourage discussion and manage even the basics of end of life care
  – Advanced directives
    • Issue of capacity
  – POLST
  – Living will
  – Durable Power of Attorney
  – Estate issues
  – Elder law referrals
Future Directions

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

- GIM Integration
  - Annual Medicare Wellness Visit
  - Neighborhood Clinics

- Outcome Measurement
  - Dementia Performance Measurement Set (AAN, 2011)
Future Directions

- Aducanumab
- Phase 1B
- Reduced plaque and clinical symptoms
Resources

- Dementia Action Collaborative/State Plan
  - https://www.dshs.wa.gov/altsa/stakeholders/alzheimers-state-plan
Resources

- Alzheimer Association (www.alz.org)
  - Taking Action workbook:
  - Living Well workbook:

- 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/
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References/Resources

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