The future of dementia research is shifting. First, recent genetic studies have found that dementia is a group of diseases rather than a single clinical entity. Second, epidemiological studies have seen a recent decline in the incidence of dementia which demonstrates that it may be amenable to intervention and preventative measures. As a result, the focus of research is moving from strictly biochemical research to genetic, lifestyle, environmental issues and from reactive to proactive health. This research may enable us to identify people at risk and providing safe, affordable interventions to prevent the disease rather than treat it in later life.

**DISCLAIMER**

This webinar is intended for educational purposes only. It is not a substitute for formal medical training in one of the health care professions, nor is it a substitute for professional medical advice. For more specific information you may have to consult a health care professional.
The Future Shift of Dementia Research

February 14, 2017

Presented by:
Alfred W. Norwood, BA, MBA

What We Will Cover

A glimpse into the future
• A review of mental aging basics, new perspectives on:
  – Normal brain operation and aging
  – Abnormal brain aging and dementia

What We Will Cover

A glimpse into the future
• Where research is trending
  – From pharmaceuticals to lifestyle
  – From reactive to proactive
• Two current keys to healthy brain aging
  – Mindful meditation
  – Physical exercise
What is on the Horizon

• USA's 18 trillion dollars in debt
• Government pays 80% of healthcare
  – Home Care's cheaper than SNF
  • Fund home care don't fund SNFs
  • Maintain/ increased oversight

What is on the Horizon

• Changes in LTC resident population
  – Older with more acuity
    shorter, higher care stay
  – Increased behaviors
    Only diseases of aging growing: depression and dementia
• Need to move from reactive to proactive mental health

Our Aging Brain - Neurons
Our Aging Brain - Neurons
Our Aging Brain - Neurons

- Our brains contain billions of neurons
  - A billion seconds ago was 1959
  - A billion minutes ago Christ was alive
  - A billion hours ago man hadn’t evolved

Our Aging Brain - Neurons

- Each neuron has 10-1000 connections

Our Aging Brain - Neurons

- Neurons are born, migrate connect and die based on
  - Genetics
  - Environment
  - Repetition
  - Repair
### Our Aging Brain – Structures

<table>
<thead>
<tr>
<th>Lizard Brain</th>
<th>Mammal Brain</th>
<th>Human Brain</th>
</tr>
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<tbody>
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<td>Brain stem and cerebellum</td>
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<td>Decisions</td>
<td>Reasons, rationalizes</td>
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- **Lizard Brain**: Basic functions like fight or flight, autopilot tasks.
- **Mammal Brain**: More complex functions such as emotions, memories, and habits.
- **Human Brain**: Highest level of function including language, abstract thought, and imagination.
Our Aging Brain – Structures

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Our Aging Brain – Networks

New research found 3 main networks

1. Salience Network
   - Monitors senses
   - Feeds other networks or fight or flight

2. Exec/control Network
   - Process salience
   - Directs attention
   - Selects response
Our Aging Brain – Networks

New research found 3 main networks

3. Default mode network
   - On except when thinking
   - Envisions the future
   - Remembering the past

Thinking about Thinking

- We are all sentient beings and attentive to environment therefore:
  1. Are most decisions we make, conscious and well thought out?
  2. Do we spend most of our time planning out what we will do next
  3. Do we “manage” most emergencies

- We are mostly non-conscious, default mode, mammalian brained beings
  - We continuously run an automatic memory “video” projection of what will happen next

- The anticipated video initiates behavior

- If video becomes inaccurate
  - & emergency -> reptilian brain
  - No emergency -> executive brain
Thinking vs. Non-thinking

- Is driving a car a conscious behavior?
  - Meant to drive to location A but wound up at location B?
  - Driven to location A but can’t recall how?
- Loud noise
  - Newborn startle reaction + crying
  - 3 month old learns to look toward noise
- Repetition (learning) enables management of sensory stream
- Automation frees up conscious thought

Normal Brain Aging

- Aging results in a net loss of neurons
  - Fewer born (neuroplasticity) than lost
- Losses not distributed evenly
  - More losses in
    - The upper (human) brain and executive network
    - The middle (mammalian) brain and default network
  - Accommodated by
    - Neuroplasticity – local re-tasking of neurons
    - Reassigning some default tasks to the executive
- Result is loss of some memory and focus

Abnormal Brain Aging

Why more rapid decline?

- Historic research
  - Alzheimer’s and Parkinson and amyloids
  - Kills neurons in executive and default networks
    - Accounts for memory and thinking problems
  - Nun study shows some with amyloids are OK
  - Epidemiological research shows recent decline in dementia incidence
Abnormal Brain Aging

Why more rapid decline?
• New research
  – Genetic, environmental and lifestyle

Looking Ahead

• Pharmaceutical dementia cures don’t exist
  – No new FDA approvals since 2003
  – 99% failure rate of emerging drugs
• Non-pharmacological research identifies:
  – e.g. sauna bathing may prevent dementia
• Combined biomedical and lifestyle research
  may yield best immediate brain health strategies
  – e.g. loneliness may cause amyloid build up

Use it or lose it

• Neurons, neural circuits, neural networks
  – That are used get stronger
  – That are unused get weaker and deteriorate
• Computer games subscribe to this premise
  – Some games effective, some not so much
• Math and Japanese aged
  – One math page keeps dementia away
• Two types of preventative lifestyle activities
  – Physical exercise
  – Mental exercise
Physical Exercise

- Aerobic exercise, (walking)
  - Cardiovascular benefit
  - Improved neural connectivity
    - Neural connections
    - Executive and Default Networks
  - Decreased mental declines
    - Memory, executive function, visuospatial skills, and processing speed
- Anaerobic exercise (weightlifting)
  - Improved cognitive not cardiovascular
  - Nursing home Nautilus equipment

Why does exercise work?

- The Circulation effect
  - Aerobic and cardiovascular improvement
- The self image effect
  - Repetitive simplicity/kinesthetic rewards
- The sleep effect
  - Improves quality of sleep and behavior
- The Body Mass Index (BMI) effect
  - Dementia associated with too high/low BMI
- Explains the Nautilus equipment effect

Mindful Meditation

- Revision of traditional meditation
  - Practice sitting in silence, twice a day
  - Focus on breathing
  - Gently forcing all conscious thoughts away
  - Exist only in the hear and now
- Researched benefits of mindful meditation
  - Longer attention spans
  - Reduced high blood pressure
  - Improved memory, sense of self, empathy, stress
Religious vs. Mindful Meditation

- Mindful meditation benefits based on rest
- Religious meditation is more active
  - Understanding and realizing God’s purpose
  - Achieve inner quiet through focus
- Mindful meditation deactivates neurons

Religious vs. Mindful Meditation

- But religious meditation also reduces stress
  - Stress increases brain deterioration
  - Religious meditation reduces stress/anxiety
- The latent issue of abandonment

Strengths and Weaknesses

- Strengths of religious meditation
  - Build stronger neural connections
  - Neurons that wire together fire together
  - Supplies comfort and stress reduction
- Weakness of religions meditation
  - May reduce participation in other activities
  - More diverse activities beneficial in aging
- Must avoid doorway to isolation
Isolation

- Loneliness is social and emotional isolation
  - Associated with depression and dementia
- Physical sources of isolation
  - Sensory losses
  - Physical mobility losses
  - Incontinence
- Mental sources of isolation
  - Depression, delirium and abandonment

Evaluating Brain Aging

7 sources of mental health evaluation
1. Psychiatric evaluation
2. Suicide ideation
3. Family history
4. Social changes
5. Medical history
6. Labs
7. Neuroimaging

Summary

- Mental health on aging is changing
  - From mostly biomedical to lifestyle
- Knowledge of brain operation is changing
  - From sentient to semi sentient beings
February 14, 2017
Webinar @ 1:00 PM ET
The Future Shift of Dementia Research
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Summary

- Research maintaining mental health indicates:
  - Abnormal brain aging starts earlier
  - Need to switch from reactive to proactive
  - The burden for prevention is individual
- Two forms of exercise provide prevention
  - Physical exercise; both aerobic and anaerobic
  - Mental exercise; both mindful and religious

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The Future Shift of Dementia Research

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Meet the Speaker — Alfred W. Norwood, BA, MBA

Mr. Norwood is a behavior specialist who uses applied behavior analysis combined with current neuropsychology to resolve behaviors in community and institutional based seniors with cognitive and memory deficits. He has worked as a consultant for profit and non-profit nursing and assisted living facilities, group homes and families. He has trained caregivers in the prescription use and measurement of non-pharmaceutical, individualized care plans. The techniques he employs for training are the result of extensive training experience, and his understanding of the mechanisms of learning, attention, conscious processing and memory. His clients are taught to develop and use a wide variety of easy to deploy non-pharmacological interventions for the most commonly seen behaviors. His focus is on helping clients build highly individualized, pro-active and effective care plans. All interventions are research based and proven in numerous successful applications.

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Save the dates for the upcoming NRRO webinars. Please be sure to suggest topics when completing today’s evaluations.

Tuesday, May 16, 2017
Tuesday, August 22, 2017
Tuesday, November 14, 2017

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April 19-20, 2017
The Art of Forgiveness: A Spiritual and Scientific Approach to Healing
Germantown, NY

June 10, 2017
Keeping a Healthy Organization
New Orleans, LA

October 9-10, 2017
Long-term Care Conference
Germantown, NY
April 19-20, 2017

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