Lowering the Risk for Alzheimer’s Disease (AD)

Output: Body & Mind

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The hippocampus & cortex are areas of brain affected by AD. “Hippocampus” means “seahorse”. It is important for spatial memory\(^1\)

\(^1\)Maguire J. Neurosci. 1997
Neuron lose synaptic connections, then dendrite branches & eventually die in AD.

Other cell types are involved:

- astrocytes
- oligodendrocyes
- microglia
- endothelia
AD brain tissue has microscopic Aβ plaques & neurofibrillary tangles of p-tau

The brain shrinks in advanced AD
We identified a compound that increases in pro-cognitive sAPPα. DDL-110 is now moving to clinical trials for Mild Cognitive Impairment (MCI).
Early diagnosis & treatment are key. More than one intervention will likely be necessary. Drugs are more likely to work if health is improved.

“Multimodal treatment”

Healthstyle support

Early diagnosis of cognitive impairment

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Output: Body & Mind

Exercise improves cognitive function
Use body & mind together by dancing, playing tennis or golf, or by yoga practice
Strength building equally important – it increases Brain-Derived Neurotrophic Factor (BDNF)

Output

The importance of social interaction, intellectual challenges, exercise, and general health to the preservation of cognition are discussed.

Intake

Scientific/biochemical bases for how what/when we eat & how medications we take affect cognition are presented.

Intake: Nutrition & AD

What are anti-oxidants?
A rainbow of possibilities
AGEs & the Mediterranean diet
Hydration!
Turmeric – Rx for AD?
Keep glycemic index low
Intermittent fasting?
Coconut oil is back
Resveratrol & thou
Exercise improves cognitive function!
Use body & mind together by dancing, playing tennis or golf, or by yoga practice.
Strength building is equally important – it increases Brain-Derived Neurotrophic Factor (BDNF)."
Walking/hiking combined with a spatial memory (navigational) challenge is excellent for spatial memory.

Use a map, try new routes, and re-enforce with return trips.

^5Brown, J. Neurosci. 2014
Loss of bone density is associated with reduction in estrogen/androgens. Have calcium levels measured, supplement if necessary.

Have bone density determined. Sunscreen reduces D3 conversion, take a supplement if D3 is low. Strength training increases bone density. There is correlation between bone density & cognitive decline\(^6\)

\(^6\)Zhou, Curr Alzheimer Res. 2014
Brain debris, including Aβ, are cleared during sleep. And memories are consolidated during sleep. Lack of sleep impairs cognition & increases disease. Keep room dark & cool.

Avoid chronic use of sleep aids such as zolpidem & diphenhydramine if possible.

Apnea (cessation of breathing while sleeping) leads to damage to the brain. Apnea prevents restorative sleep & can cause vascular disease.

Caused by chronic respiratory disease, inflammation, orthopedic or neurological issues.

10 Arli, Appl Neuropsychol Adult. 2014
Chronic stress increases tau phosphorylation & tangles

Exercise & sleep relieve stress

Yoga & daily meditation are also good - meditation preserves gray matter (neurons)

Pets, comedy, music all reduce stress

Mindful-Based Stress Reduction increases "functional connectivity"\textsuperscript{10}

\textsuperscript{11}Wells, Neurosci. Lett. 2014
Creating music stimulates brain areas important for neurogenesis (new cell formation)
Learn to play an instrument…
…even your own voice
Music triggers memory

Oliver Sacks’ Musicophilia

Alive Inside documentary: Music & Memory
Laughter & ‘Kawaii’

Humor, comedy and laughter can effectively relieve stress

“Social laughter is correlated with an elevated pain threshold”*

Norman Cousin’s *Anatomy of an illness*

Can relieve stress and depression

Improves short-term memory

*Kawaii improves focus*

Brain Health and The Senses

Loss of sensory input impairs cognition\textsuperscript{11}. Hearing – have it tested, get hearing aids.

Have aldosterone levels determined & corrected.

Olfaction (smell) – focus on olfactory experiences.

Sight - Keep eyeglass prescriptions up-to-date.

Taste – add variety

Expand all sensory experiences

\textsuperscript{12}Bush. Ear Hear. 2015
A New Way of Thinking

Use all of your cognitive abilities
Try something new
Be a teacher
Discuss ideas
Master a new skill
Focus intently on a new subject
Consider brain training software or games to follow performance\textsuperscript{13}

Why are we expected to learn less as we age?

\textsuperscript{13}Cuddy Ann N Y Acad Sci. 2015; \textsuperscript{14}Kuhn
Goals in Later Life

Give yourself a sense of purpose beyond career. Volunteer using your skill set. Interact with & contribute to your community. Maintain inter-generational relationships. Pursue spirituality and...

\[15\text{Paganini-Hill Alz. Dis & Assoc. Dis. 2015}\]
Support the Health of Others

Share activities
Be a “good” host providing healthy choices
Suggest a walk
The holidays do not have to be unhealthy
Friends & spouses share similar “healthstyles”
Share your knowledge

\(^{16}\text{Christakis N Engl J Med. 2007}\)
Accurate Diagnosis is Critical

Diagnostics include:

- Computer-assisted tomography (CAT) for structural abnormalities
- Positron emission tomography (PET) for glucose use & amyloid imaging
- Function magnetic resonance (fMRI) for blood flow
- Tests of cognitive function

Other causes of memory loss:
- Depression, infection, multiple sclerosis, low B12, hypothyroidism, medication interactions, tumor

Not all dementia is AD:
- Vascular dementia, Parkinson's/Lewy Body disease, frontotemporal dementia

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