

Enhancing Brain Resiliency and Averting Cognitive Decline-- Transcendental Meditation® and the Bredeesen Protocol®

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Enhancing Cognitive Performance through the *Transcendental Meditation* technique

Theory

- Integration of information for comprehension, learning, and creativity takes place during periods of rest.
- The integrated state of deep rest and integrated brain functioning provided by TM is an optimal condition for enhancing comprehension, learning, and cognitive function.

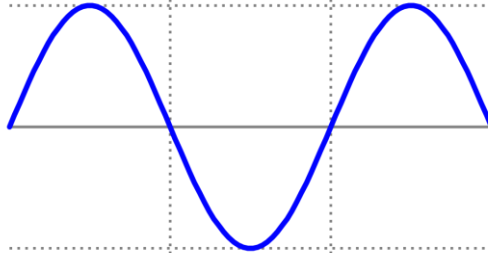
Research

- TM develops brain integration and EEG coherence, as well as increased activity in the default mode network (DMN), providing a powerful tool for learning and creativity.
- TM improves attention, intelligence, creativity, and learning in all age groups, including the elderly.

Improved Cognitive Processing through the Transcendental Meditation technique

Active Phase-Executive Network

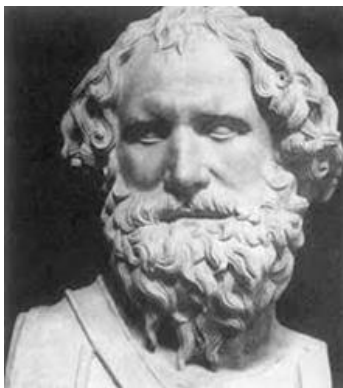
Focus on information and experience



Rest Phase-Default Network

Consolidation and comprehension of information
and experience

Archimedes: “Eureka!”(I found it!)

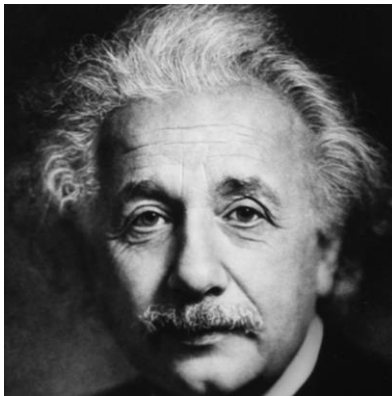


Archimedes of Syracuse, 287 - 212 BC. One of the greatest mathematicians, physicists, engineers, inventors, and astronomers of ancient times.

“All profound things and emotions of things are preceded and attended by silence.” “Herman Melville



“I think 99 times and find nothing. I stop thinking, swim in silence, and the truth comes to me.” Albert Einstein



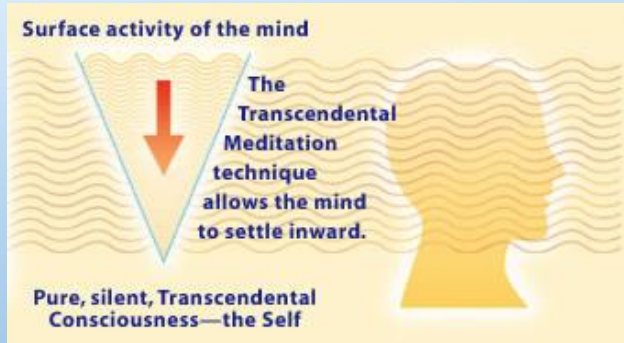
Examples of discovery through the Eureka! effect

Discoverer	Discovery
Albert Einstein	Theory of Special Relativity
Rene Descartes	Analytic Geometry
Nikola Tesla	Alternating Current
Otto Loewi	Nerve impulses are transmitted chemically
George de Mestral	Velcro
Arthur Fry	Post Its

Alternating Rest and Activity Cycles Enhanced Cognitive Function

- Massed and Spaced Practice: Faster learning occurs with rest periods spaced between practice periods
- Diurnal Cycles: Memory consolidation occurs during sleep and dreaming.
- Humor: Gaps created by humor produce new insights.

The Transcendental Meditation Technique

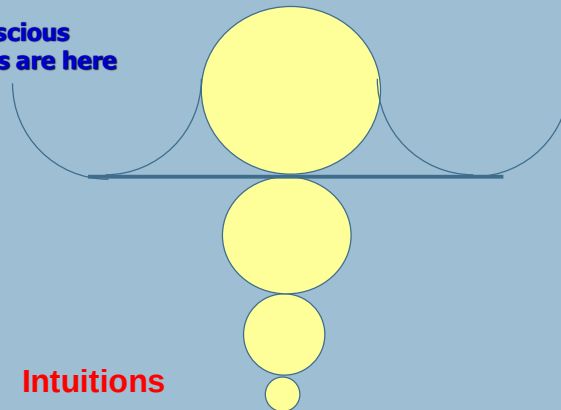


"Yogas chitta-vrtti-nirodhah"
Patanjali Yoga-Sutra, 1.2
250 BC

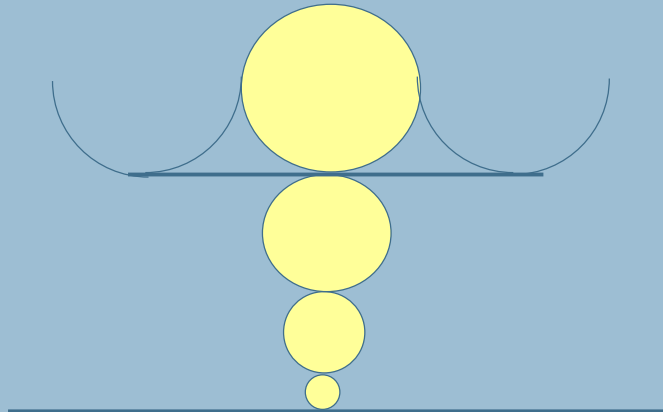
"Yoga is the least excited state of consciousness, pure consciousness"

The Mind has a Vertical Structure

Conscious thoughts are here



Transcending during TM



Transcending during TM

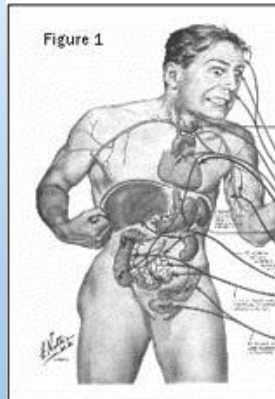


Pure Consciousness

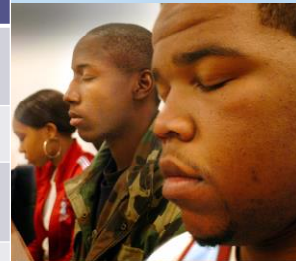
The Physiological Effects during TM are Opposite to Fight-or-Flight Response

Fight or Flight

Transcendental Meditation



Fight or flight	TM
• Faster breathing	• Decreased respiratory rate
• Faster heart rate	• Decreased heart rate
• Increased blood pressure	• Decreased blood pressure
• Increased muscle tension	• Decreased muscle tension
• Sweaty palms	• Dry palms



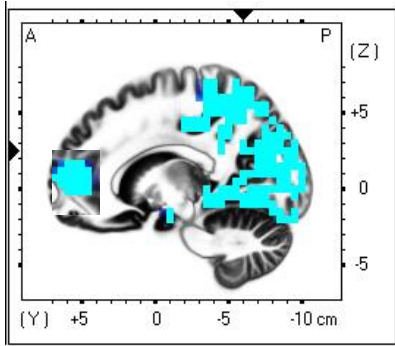
Dillbeck M and Orme-Johnson D (1987). *American Psychologist*, 42, 879–881.

Meditations Differ in their Effects on the EEG



Reference: *Consciousness and Cognition* 2010 19(4):1110-1118

Meditations Differ in their Effects on the Default Mode Network—Self-Referral



Default Mode Network
Medial Prefrontal Cortex (left) and
Posterior Cingulate Cortex (right)

Object Referral: focusing attention on external objects *decreases* DMN activity.

Focused Attention and Open Monitoring both decrease DMN activity.



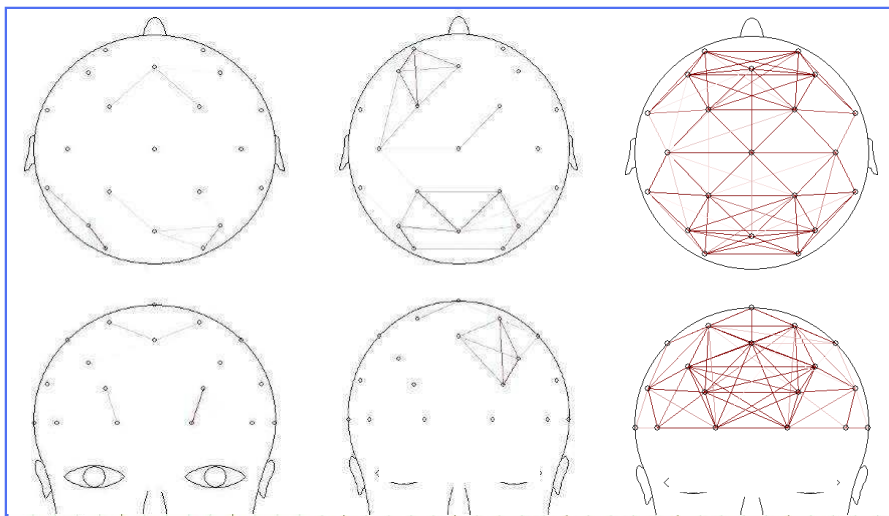
Self-Referral: Internal focus on self (me, mine, myself, transcending) DMN activity *remains high*. (1).

In Automatic Self-Transcending (TM technique) DMN activity remains higher.



Reference. Brain and Cognition. 2017;111:86-94.

TM Increases Alpha1 EEG Coherence



Eyes Open

Eyes Closed

TM Practice

References: *International Journal of Psychophysiology*, 116, 1519-38 (2006); *Biological Psychology*, 61, 293-319 (2002); *Consciousness and Cognition*, 8(3), 302-18 (1999); *Electroencephalography and Clinical Neurophysiology*, 35 (1973); *International Journal of Neuroscience* 14: 147-151, 1981.

Correlates of Alpha EEG Coherence

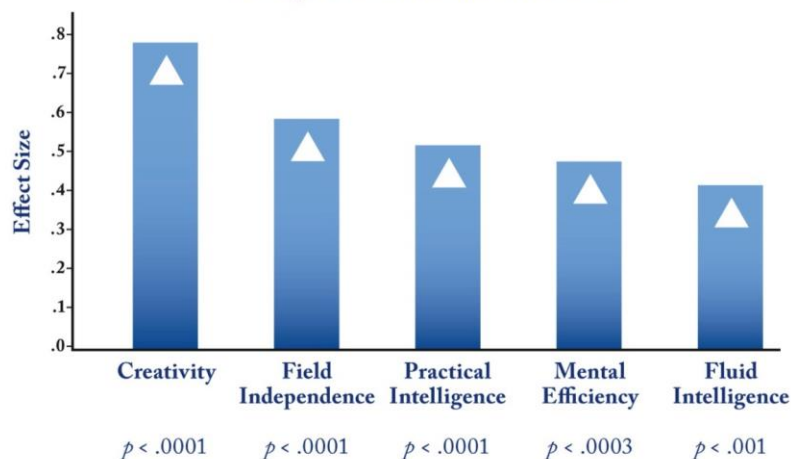
Integration of Brain Functioning



- References:**
1. Orme-Johnson DW, Haynes CT. EEG phase coherence, pure consciousness, creativity and TM-Sidhi experiences. *International Journal of Neuroscience*. 1981;13:211-7.
 2. Dillbeck MC, Orme-Johnson DW, Wallace RK. Frontal EEG coherence, H-reflex recovery, concept learning, and the TM-Sidhi program. *International Journal of Neuroscience*. 1981;15(3):151-7.
 3. Nidich SI, Ryncarz RA, Abrams AI, Orme-Johnson DW, Wallace RK. Kohlbergian moral perspective responses, EEG coherence, and the Transcendental Meditation and TM-Sidhi program. *Journal of Moral Education*. 1983;12(3):166-73.
 4. Orme-Johnson DW, Clements G, Haynes CT, Badawi K. Higher states of consciousness: EEG coherence, creativity, and experiences of the sidhis. In: Orme-Johnson DW, & Farrow, J., editor. *Scientific Research on the Transcendental Meditation program: Collected Papers* (Vol 1). Rheinweiler, Germany: MERU Press; 1977.
 5. Travis FT, Arenander A. Cross-Sectional and Longitudinal Study of Effects of Transcendental Meditation Practice on Interhemispheric Frontal Asymmetry and Frontal Coherence. *International Journal of Neuroscience*. 2006;116(12):1519-38.

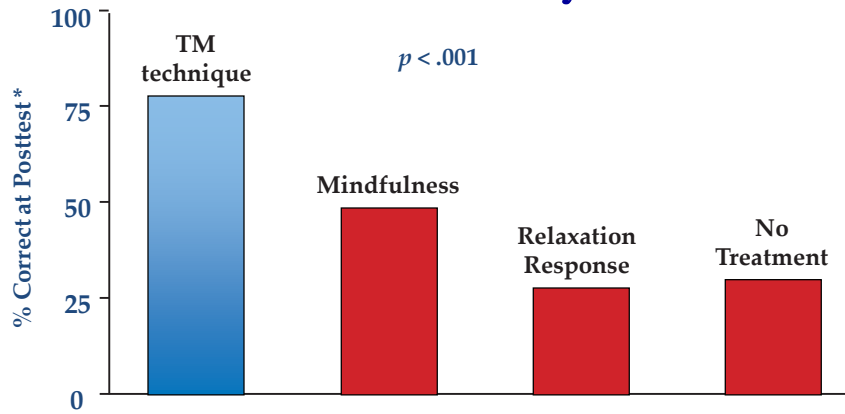
HOLISTIC IMPROVEMENT IN INTELLECTUAL PERFORMANCE

Through Transcendental Meditation



Reference. K. T. So, Orme-Johnson D. W. "Three randomized experiments on the holistic longitudinal effects of the Transcendental Meditation technique on cognition." *Intelligence* 29, no. 5 (2001): 419-440.

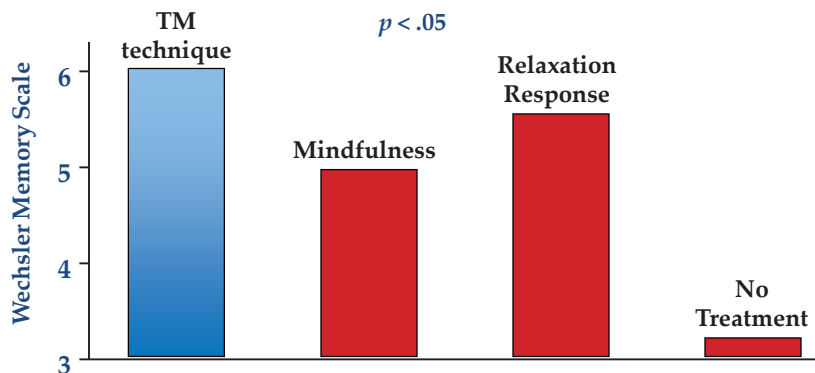
Improved Cognitive Flexibility in the Elderly



A study of 80-year olds conducted at *Harvard* found that practice of the Transcendental Meditation technique increases cognitive flexibility.

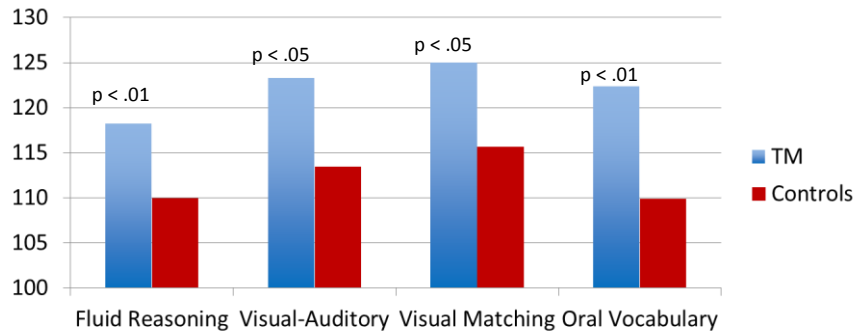
Reference. C. N. Alexander, Langer E. J., Newman R. I., et al. "Transcendental Meditation, mindfulness, and longevity: an experimental study with the elderly." *Journal of Personality and Social Psychology* 57, no. 6 (1989): 950-964.

Improved Memory in the Elderly



Reference: Alexander, C. N., Langer, E. J., Newman, R. I., Chandler, H. M., and Davies, J. L. (1989). Transcendental Meditation, mindfulness, and longevity: an experimental study with the elderly. *Journal of Personality and Social Psychology*, 57 (6): 950–964.

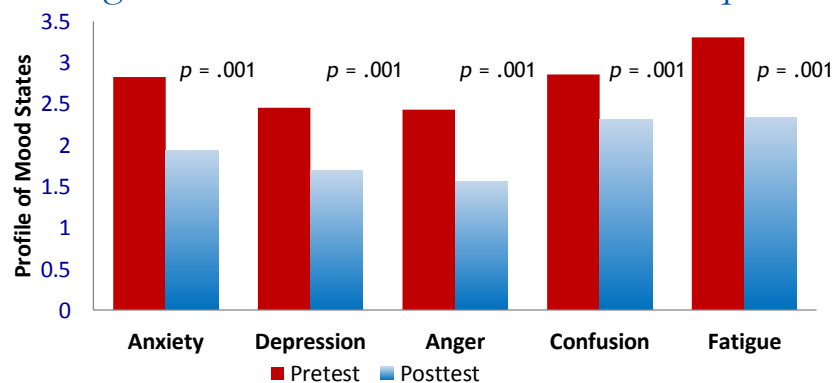
Higher Level of Cognitive Ability in Elders through the *Transcendental Meditation* technique



A study of elders between the ages of 60 and 74 found that those practicing Transcendental Meditation exhibited significantly higher levels of fluid reasoning, verbal intelligence, long-term memory, and speed of processing than matched controls.

Reference: *Journal of Social Behavior and Personality* 17, no. 1 (2005): 217-28.

Decreased Mood Disturbances in Family Caregivers through the *Transcendental Meditation* technique



Reference. Nidich S, Nidich RJ, Salerno J, Hadfield B, Elder C. Stress reduction with the Transcendental Meditation program in caregivers: A pilot study. *International Archives of Nursing and Health Care Perspectives*. 2015;1(011):1-4.

Summary: TM Improves Cognitive Performance

- TM increases EEG coherence, default mode network activity, and brain integration, which are associated with improved cognitive and emotional functioning.
- TM has been shown to increase general cognitive ability, including whole brain creativity, practical and fluid intelligence, mental efficiency, and attention.
- Among students, TM has been shown to improve basic skills and academic performance, reduce drop-out rates, and increase graduation rates and advancement to post-secondary education.

Alzheimer's Disease: TM + Bredesen Protocol Collaboration

ALZHEIMER'S DEFINITION

Alzheimer's disease is a progressive disease that destroys memory and other basic mental functions.

The condition causes loss of connections between brain cells (neurons), causing a steady decline in memory and mental function.

It is associated with characteristic physical changes between and within neurons, called A-Beta (amyloid) and Tau tangles.

ALZHEIMER'S STATS

- #1 leading cause of cognitive decline
- Now the #3 leading cause of death in the US
- 5.4 million Americans currently living with A.D. (1 in 9 over age 65); 30 million worldwide
- 2050 projections: 13 million Americans, 160 million worldwide
- Potential to bankrupt Medicare and Medicaid

ALZHEIMER'S: CURRENT STATE OF TREATMENT

- From the Alzheimer's Association: "A genuinely new Alzheimer's drug has not been approved since 2003, and the currently approved Alzheimer's medications are ineffective in stopping or slowing the course of the disease."
- This despite hundreds of clinical trials for A.D. costing billions of dollars in the last decade alone.
- A.D. is the only one of the 10 most common causes of death for which there is no effective treatment.

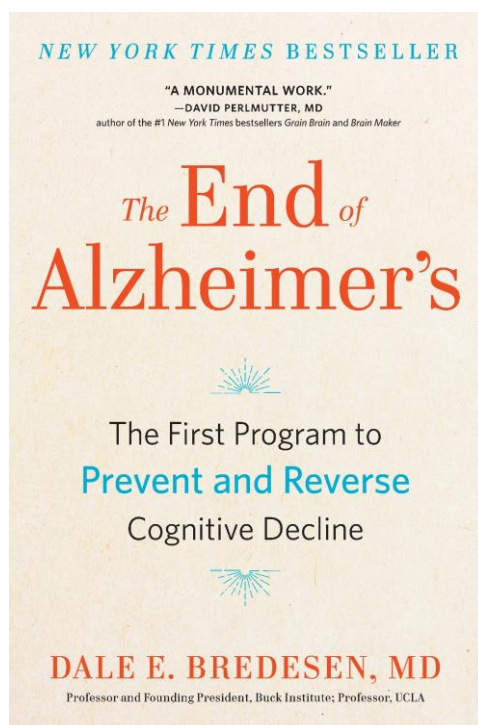
ALZHEIMER'S: GENETIC PREDISPOSITION

ApoE4 gene:

- No copies: 9% lifetime risk
- One copy (75 million Americans): 30% lifetime risk
- Two copies (7 million Americans): 50-90% lifetime risk

THE BREDESEN PROTOCOL

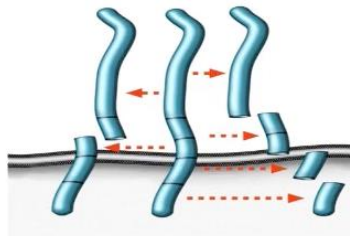
- Dale Bredesen, MD, Professor of Neurology, UCLA; author of “The End of Alzheimer’s”
- Bredesen Protocol is first approach that has shown reversal of cognitive decline in patients with Alzheimer’s and pre-Alzheimer’s
- It is a multi-modality program (diet, lifestyle, herbs, supplements) rather than a monotherapy (single therapy approach, like a drug)

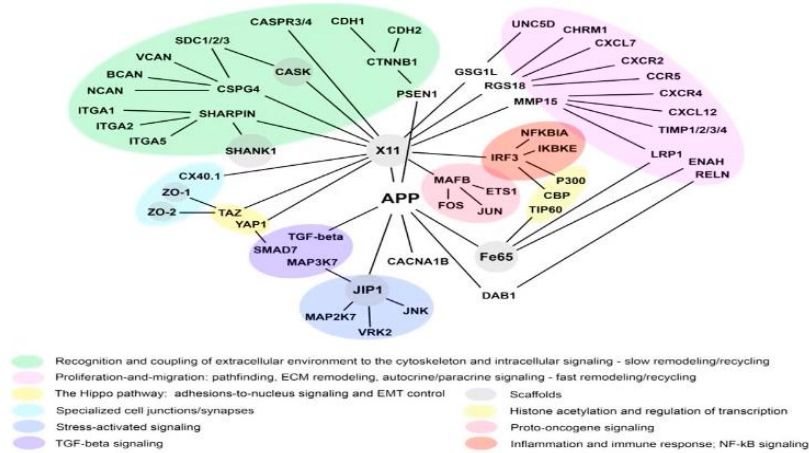


A NEW PARADIGM FOR UNDERSTANDING THE CAUSE OF ALZHEIMER'S

- Alzheimer's is caused by an imbalance in molecular "signaling" that results in retraction and death of brain cells and reduction in their connections (synapses)
- The result: synapse-destroying (synaptoclastic) processes overtake and outweigh synapse-creating (synaptoblastic) processes

APP- The "Barometer"





BREDESEN PROTOCOL KEY INSIGHTS (1)

- Because the cause of A.D. is multi-factorial, it requires a network-based therapeutic approach rather than a single targeted approach
- Address as many of the network components as possible
- “A roof with 36 holes”
- Optimize metabolic values, not just normalize them
- Threshold effect: once sufficient targets are effectively optimized, the disease process is reversed

BREDESEN PROTOCOL KEY INSIGHTS (2)

- A.D. is not a single disease, but rather the product of several different pathological processes
- There are 3 main sub-types of A.D.
- First step in treatment: a battery of tests to diagnose the type of A.D. (the “cognoscopy”)
- This determines the angle of treatment
- Same principle for prevention: determine the underlying type of metabolic vulnerability and correct it

A Roof with 36 Holes



Dr. Bredesen.....

Age 50 is time for your colonoscopy.

Age 40 is time for your *cognoscopy*.

Dr. Bredesen.....

Patient Zero

Metabolism and Cognition Go Hand in Hand

66M ApoE4/3	2014	2015 (Rx 10 mos.)
Fasting insulin	32	8
Hs-CRP	9.9	3
Homocysteine	15	8
Vitamin D3	21	40
Symptoms	Struggling	Working full-time
MRI hippocampal volume	17%ile	75%ile



3 SUB-TYPES OF ALZHEIMER'S

- ◆ Type 1- Inflammatory (“Hot”)
- ◆ Type 1.5 – Sugar (“Sweet”)
- ◆ Types 2 – Trophic (“Cold”)
- ◆ Type 3 – Toxic (“Vile”)

12 TOP TIPS FOR BRAIN HEALTH (1)

- Transcendental Meditation for stress-reduction and brain integration
- Eat “Mediterranean diet,” —mainly organic, fresh vegetables, berries, olive oil, walnuts and other nuts (soak first in water)
- Cut out sugar and refined flour entirely.
- Eliminate “bad” fats and processed foods (chips, deep fried,) GMO
- Drink 6-8 cups of pure water daily, ideally warm or room temperature
- Get good sleep, 7–8 hours: ideally go to bed by 10 pm

12 TOP TIPS FOR BRAIN HEALTH (2)

- Don’t eat for 3 hours before bed; Fast for 12 hours, dinner to breakfast (water ok) -- Promotes brain cleansing— “autophagy”
- Brain Training 3X/ week for 15 min -- Brain HQ, Lumosity; Or, learn a language, dance, play musical instrument
- Get 50 grams of protein, but don’t overdo
- Optimize Vitamin B12 & Vitamin D levels (blood test) – supplement with Methyl-B12 and Vitamin D as needed
- Exercise—at least 30 minutes 5–6 days a week
- Avoid alcohol, smoking, and recreational chemicals

TM + BREDESEN PROTOCOL: RESEARCH AND TRAINING

- Observational study of 2,000 to 10,000 subjects is currently being launched
- Dr. Bredesen will partner with MFUSA and MAAA to offer training for healthcare professionals in the Bredesen Protocol + TM and Ayurveda
- Online course for general public, “My Ageless Brain,” offered by Dr. Nancy Lonsdorf—intensive guided webinar series

NEXT STEPS TO CONSIDER

- Instruction in the TM technique
- Read “The End of Alzheimer’s”
- Enroll in the Bredesen Protocol, including referral to a trained physician
- Enroll in Dr. Lonsdorf’s course, “My Ageless Brain”
- Participate in the “TM + Bredesen Protocol” observational study
- For health professionals: training course in Bredesen Protocol for medical practitioners

FOLLOW-UP

For handouts related to this talk and links to follow-up steps, visit:

www.ayurveda-courses.org/brain.html