



BrainMatrix, Inc. presents a program on

# Nourish Your Brain

## Anti-aging Techniques & the Prevention of Alzheimer's Disease

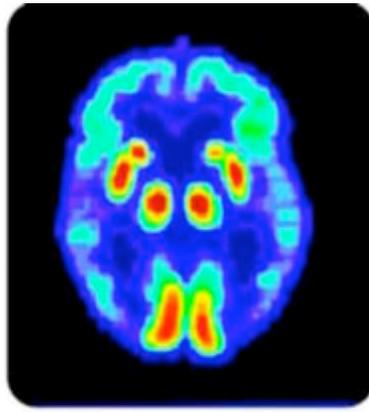
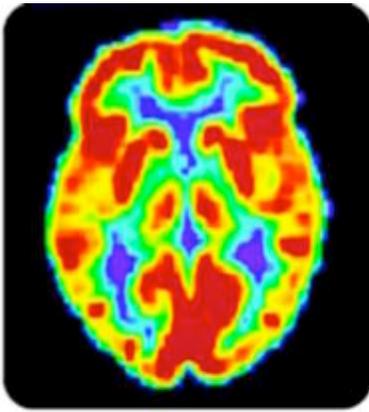
### Introduction

The current seriousness of the Alzheimer problem, both in human and economic terms, is clear. The number of people worldwide aged 60 years and older will increase from 1 in 10 currently to 1 in 6 by 2050. There is a great need to identify the disease process of dementia of the Alzheimer's type since it represents the largest percentage of dementia. There is also the need to identify objective metrics of early memory impairment, because more and more Americans are living longer and because after age 60, the incidence of dementia doubles every 5 years, and prevalence rises from 1% at age 60 to 39-47% in persons 85-95 years old.



The age risk factor strongly suggests that Alzheimer's is a lifespan disorder that starts early in life and progresses to a point that we detect noticeable declines in cognitive functions. Age-related disorders are known to be influenced by our genetic makeup as well as our lifestyle, from an early age, as depicted in the Life Path chart.

Research in three areas provides some rays of hope in this bleak picture. First is the growing appreciation of glial cell involvement not only in the symptomatic period of Alzheimer's disease (AD), but in the very early, preclinical stages. Glial dysfunction and myelin breakdown are now documented to occur as early as midlife and to progress over the next 30 to 40 years in a manner that suggests that the age risk factor for AD may be early, progressive, and extensive glial dysfunction. As such, treatments and lifestyle changes targeted to support glial function may significantly delay the onset and severity of AD.



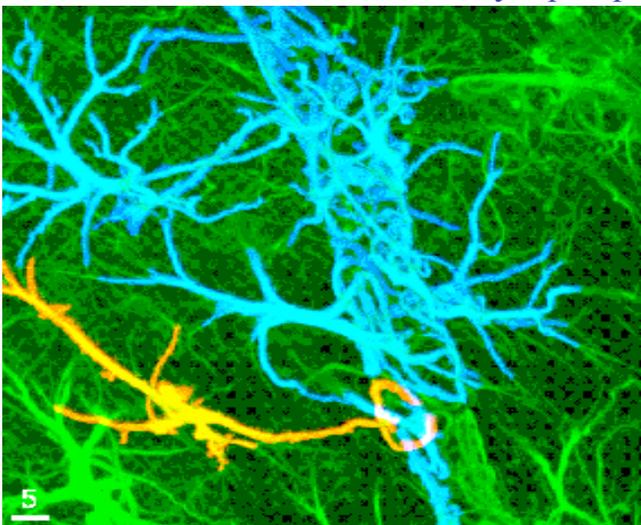
Second is the recognition that early diagnosis and treatment provides greater opportunity to delay, if not reverse, symptoms of disease progression. In the Alzheimer field, it has now been shown that mild cognitive impairment is an antecedent of the disease. Ongoing work suggests that neuroimaging with PET or MRI

may be even more sensitive and reliable and will be able to detect and track early preclinical changes, especially white matter disruption, even as early as 30 years of age. Research suggest that in the very near future event-related brainwave analysis may offer the most efficient and reliable diagnostic means of measuring the potential onset and progress of AD and other forms of dementia, as well as testing the efficacy of drug and other treatments strategies.

The third is the promise provided by new treatments. For example, a number of new pharmacological treatments are in clinical trial. However, the natural approaches of complementary and alternative medicine, based on their low cost and holistic nature, may offer the best chance to slow or reverse the cognitive and pathologic changes of AD in the population. This suggests the possibility of halting and perhaps restoring normal brain function in affected patients.

### **Glia Cells as Key Players in Brain Function**

Glial cells represent a relatively unexplored domain of brain research. Once relegated to a passive function of ‘stuffing’ or ‘glue’ these cells, which outnumber the well-known neuronal cells 10:1, are now considered to be major contributors to the development and health of the brain. Glial cells are now known to actively participate if not outright control brain nutrition and metabolism, synaptic processes, and transmission activity. They are



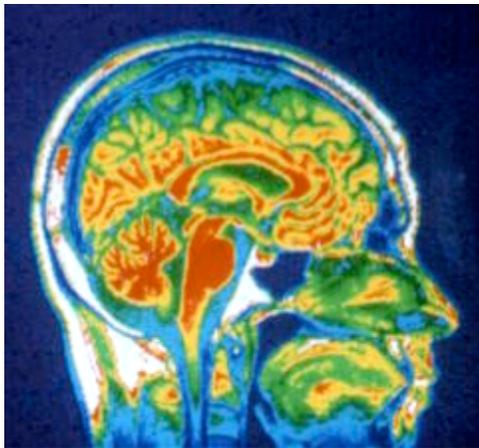
involved in controlling the blood-brain-barrier, synthesizing brain cholesterol, growth factors and general metabolic and ionic exchange and balance. They are the ‘new’ member of the synaptic world. In the ‘tripartite’ synapse, which includes the pre- and post-synaptic neuronal components along with the encapsulating glial processes, the astrocyte plays an active role in the development, maintenance, plasticity and elimination of the synapse. Finally, the production and maintenance of myelin by oligodendrocytes serves a lifelong function in enabling speed,

precision and fidelity of neuronal signal transmission, as well as huge energy savings. Evidence now suggests that changes in white matter oligodendrocytes and grey matter astrocytes precede extensive neuronal dysfunction in AD.

### **Glia Involvement in Aging and Age-Related Disorders**

Cortical regions with the most protracted development are those serving higher cognitive functions (frontal, temporal and parietal association areas) and are those most vulnerable to AD pathology. These association areas continue to rely on new myelin producing cells well into the fifth decade of life. And, the vulnerability of the white matter glia increases with increasing age at differentiation. These glia, especially in the presence of beta-amyloid, experience altered cholesterol metabolism and excessive oxidative stress on myelin membrane. This progressive increase in the toxicity of the cortical areas is thought to form the basis for the age risk factor for AD.

The current model of Bartzokis outlines a progressive glial imbalance that leads to lesions that eventually cause neuronal dysfunction and degeneration. More specifically, the protracted myelin development leads to excessive oxidative stress and vulnerable late-

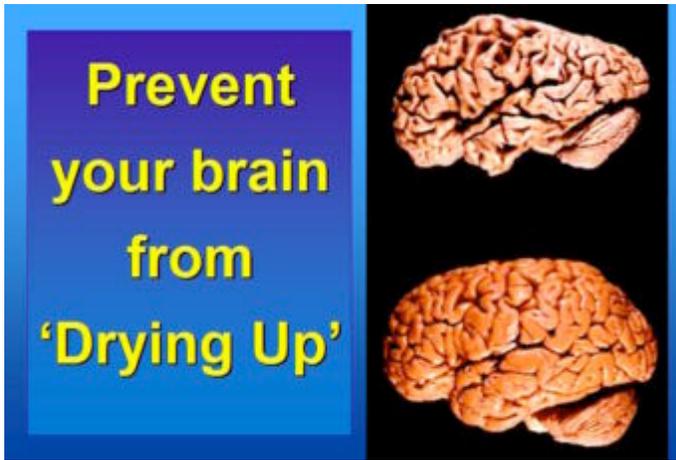


myelinating oligodendrocytes in cortical association areas. With myelin breakdown comes a disruption in neuronal impulse traffic that results in network incoherence. This growing loss of synchrony underlies the continuing decline in cognitive functions that rely on the proper functioning and integration of these cortical areas. The loss of executive functions of the prefrontal cortex, spatial/attentional processes of the parietal cortex, and the memory functions of the temporal cortex and hippocampal region are reflected in the pattern of cognitive disorders reported for AD individuals.

### **The Impact of Ayurveda on the Aging Process and Alzheimer's Disease**

Currently, the only proven means of impacting the onset and progression of AD are related to changes in diet and lifestyle, including physical and mental exercise. The addition of Ayurveda offers a whole system of effective interventions. Classical ayurveda was been restored to a more complete science of healthcare over the last 30 years and is referred to as Maharishi Consciousness-Based Healthcare. This extensive body of knowledge provides a systematic and comprehensive understanding of mind/body health which should greatly increase the options available to combat this unfortunate disorder. Ayurveda, through its holistic view of the physiology and its developmental trends, provides specific dietary and herbal recommendations for successful aging and for treatment of age-related disorders.

## Don't Let Your Brain 'Dry Up'



Ayurveda states that with advancing age, the makeup of the brain and body gradually shifts to becoming more and more agitated and dry. Alzheimer's is often associated with marked shrinkage of the brain. In the diagram, the difference between a normal healthy senior and a brain of an Alzheimer's patient are evident. This 'drying' effect is a powerful tendency that must be remedied by proper diet, digestion and routine. Ayurveda can diagnosis such

imbalances and offer specific prescriptions for nourishing the brain and counteracting this natural 'drying' influence.

### Impact of Consciousness in Aging

More importantly, it's fundamental, consciousness-based methods, including meditation, offer considerable hope in increasing and restoring balance in brain physiology. The most widely used and researched meditation technique is Transcendental Meditation which has been shown to significantly increase brain coherence and integration which leads to greatly improved physiological and psychological health.



Over 40 years of research indicate the ability of meditation to enliven the body's own inner intelligence to promote healthy mind/body functions, including reductions in chronic diseases, some of which are risk factors for AD, and a wide ranging set of measures of aging. In addition, the practice of meditation allows individuals to become more flexible in their thinking and behavior and thus more likely

to explore, accept and use alternative lifestyle choices that promote health.

Thus, Ayur-veda, by offering a powerful contribution to enhancing brain integration, specifically the health of glial cells and myelin, can help us delay if not prevent the onset of AD.

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