



**NUTRITIONAL STRATEGIES
FOR THE AGING MIND:**

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COURSE LEARNING OUTCOMES

- ▶ 1. BE ABLE TO COMPARE ASPECTS OF THE BRAIN VS THE MIND
- ▶ 2. UNDERSTAND THE ANATOMY OF THE BRAIN
- ▶ 3. UNDERSTAND COMMON BRAIN DISORDERS
- ▶ 4. UNDERSTAND TRADITIONAL CHINESE MEDICINE'S VIEW OF THE MIND/BRAIN
- ▶ 5. UNDERSTAND TELOMERES AND AGING

COURSE LEARNING OUTCOMES CONT.

6. Understand physical and chemical changes in the brain/mind
 7. Understand how the immune system can affect the brain/mind
 8. Learn about herbs/foods to boost the immune system
 9. Understand how sleep affects the brain/mind and food that help with sleep
 10. Understand how inflammation and disease affects the brain and food to combat inflammation
 11. Learn about specific diet “types” for the brain/mind
 12. Understand metabolic stress and food to combat metabolic stress
 13. Learn about other “tactics” to help the aging brain/mind
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Mind vs Brain



THE MIND

The part of the person that thinks, reasons, feels, and remembers.

- A person's "intellect"
- A person's "attention"

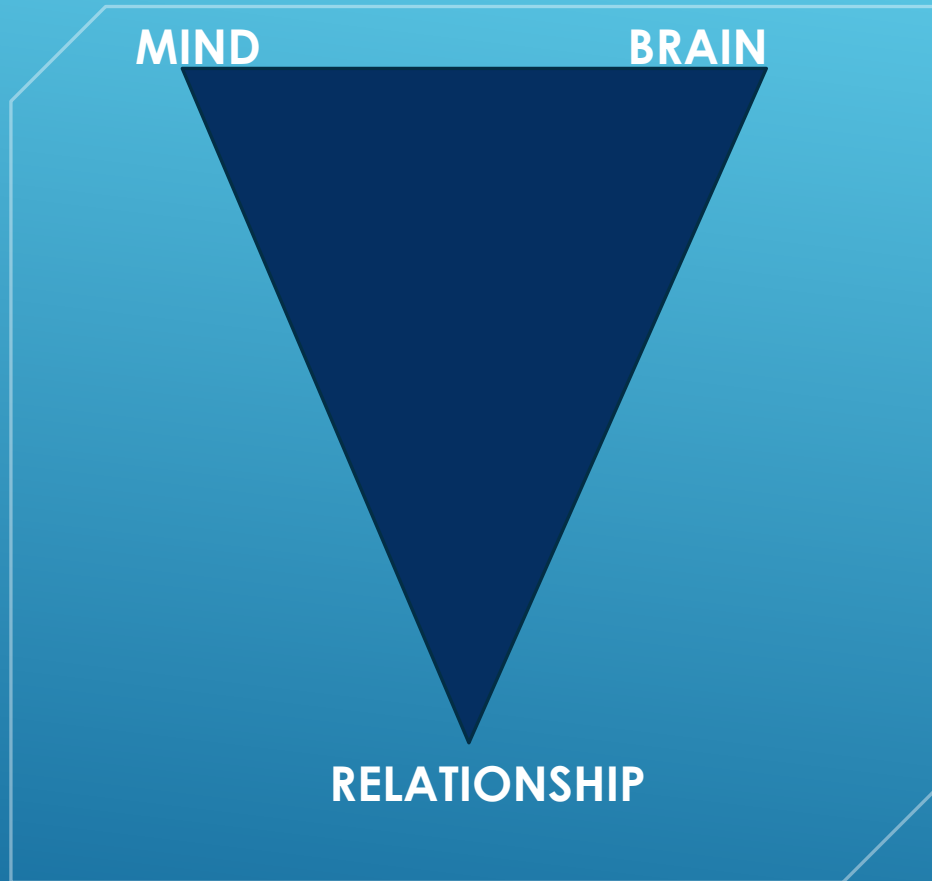
The element of a person that enables them to be aware of the world and their experiences, to think, and to feel; the faculty of consciousness and thought.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3115284/>

THE MIND

Dr. Daniel Siegel, a professor of psychiatry at UCLA school of Medicine, co-director of the UCLA Mindfulness Awareness Research Center coined the phrase “mindsight.”

It is a powerful lens through which we can understand our inner lives with more clarity, integrate the brain, and enhance our relationships with others. Mindsight is a kind of focused attention that allows us to see the internal workings of our own minds. It helps us get ourselves off of the autopilot of ingrained behaviors and habitual responses. It lets us “name and tame” the emotions we are experiencing, rather than being overwhelmed by them.



TRIANGLE OF WELL-BEING

"Our minds are created within relationships – including the one that we have with ourselves... Each of us has a unique mind: unique thoughts, feelings, perceptions, memories, beliefs, and attitudes, and a unique set of regulatory patterns. These patterns shape the flow of energy and information inside us, and we share them with other minds." Dr. Daniel Siegel

Anatomy of the Brain

The **brain** is composed of three parts:

1. Brainstem
2. Cerebellum
3. Cerebrum
 - largest part of the **brain**
 - composed of right and left hemispheres
 - divided into four lobes:
 - i. frontal
 - ii. parietal
 - iii. Temporal
 - iv. occipital

Video:

http://www.dailymotion.com/video/x12efx2_human-anatomy-brain_news

Anatomy of the Brain



Brain Disorders

“Brain disorders include any conditions or disabilities that affect the brain. This includes those conditions that are caused by illness, genetics, or traumatic injury.”

Types of brain disorders:

Brain Injuries - often caused by blunt trauma. Trauma can damage brain tissue, neurons, and nerves.

- Examples of brain injury:
 - hematomas
 - blood clots
 - contusions, or bruising of brain tissue
 - cerebral edema, or swelling inside the skull
 - concussions
 - Strokes

Brain Disorders

Brain Injury – cont.

- *Symptoms of brain injury:*
 - vomiting
 - nausea
 - speech difficulty
 - bleeding from the ear
 - numbness
 - paralysis
 - memory loss
 - problems with concentration
- *May later develop:*
 - high blood pressure
 - a low heart rate
 - pupil dilation
 - irregular breathing

Brain Disorders

Brain Injury-cont.

- *Treatment:*
 - medication (for pain)
 - Rehabilitation
 - physical therapy
 - speech and language therapy
 - psychiatry
 - brain surgery

Brain Tumors - malignant (cancerous) or benign (noncancerous)

- Primary tumors – form in the brain
- Secondary tumors – come from other parts of the body
- Grades of tumors = 1, 2, 3, & 4
 - Higher numbers more aggressive

Brain Disorders

Brain Tumors-cont.

- *Common Symptoms*
 - headaches
 - seizures
 - numbness or tingling in your arms or legs
 - nausea
 - vomiting
 - changes in personality
 - difficulty with movement or balance
 - changes in your hearing, speech, or vision
- Treatment
 - Varies – depending on size of the tumor, age, and overall health

Neurodegenerative Diseases

- Cause the brain and nerves to deteriorate over time.
- No cure; treatment can help

Brain Disorders

Neurodegenerative Diseases – cont.

- ***Common Diseases***

- Alzheimer's
- Tay-Sachs (genetic)
- Huntington's disease
- amyotrophic lateral sclerosis
- Parkinson's disease
- all forms of dementia

- ***Common Symptoms***

- memory loss
- forgetfulness
- apathy
- anxiety
- agitation
- a loss of inhibition
- mood changes

Brain Disorders

Neurodegenerative Diseases – cont.

- ***Common Diseases***

- Alzheimer's
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- a loss of inhibition
- mood changes

Brain Disorders

Mental Disorders – affect behavior patterns

- *Most frequently diagnosed*
 - depression
 - anxiety
 - bipolar disorder
 - post-traumatic stress disorder
 - schizophrenia
- *Symptoms – vary depending on condition*
 - Beware of changes in “behavior”; “thought pattern”; “mood.”
- *Major types of treatment*
 - medication
 - psychotherapy

Brain Disorders

Risk Factors



Traumatic brain injury is most common in children, young adults who are under 25 years old, and adults who are 65 and older.

Brain tumors can affect people at any age. Personal risk depends on genetics and your exposure to environmental risk factors like radiation.

Neurodegenerative diseases - older age and family history are the most significant risk factors

Mental disorders are very common. About 1 in 5 American adults have a diagnosable mental health condition.

- Risk may be higher if:
 - have a family history of mental illness
 - have or have had traumatic or stressful life experiences
 - have a history of alcohol or drug abuse
 - have or have had a traumatic brain injury

Brain Disorders

Diagnosis - How Are Brain Disorders Diagnosed?



- A neurological exam to check vision, hearing, and balance:
<https://www.youtube.com/watch?v=5UuQV-0o4CE>
- Images of the brain - CT, MRI, and PET scans
- Study fluid from the brain and spinal cord
 - bleeding in the brain, infection, and other abnormalities
- Mental health disorders are usually diagnosed based on an evaluation of symptoms and history.

Brain Disorders



Long-Term Outlook

- Depends on the type and severity of the brain disorder
- Some conditions are easily treated with medication and therapy.
- Neurodegenerative diseases and some traumatic brain injuries have no cure.
 - People with these conditions often face permanent changes in their behavior, mental abilities, or coordination.
 - Treatment may help a person learn to live with the illness and retain as much independence as possible.

Traditional Chinese Medicine and the Mind/Brain

In Chinese Medicine, the Western Medical Disease Alzheimer's, falls into the disease category *lao nian xing chi dai*, which means senile feeble-mindedness which is commonly translated as senile dementia, *wen chi*, civil madness, and *wu chi*, martial mania.

One needs to appreciate the fact that Chinese Medicine is based on a system that is thousands of years old and during the time when things like MRI, and CT-SCAN's did not exist, the way in which these diseases were named, diagnosed, or categorized by simply by observation giving them a literal and sometime artistic or nature-based name.

Traditional Chinese Medicine and the Mind/Brain

Disease cause for Alzheimer's in TCM (according to Bob Flaws & Philippe Sionneau in The Treatment of Modern Western Medical Disease with Chinese Medicine):

- Former heaven natural endowment insufficiency
- Aging
- Internal Damage by the Seven Affects (joy, anger, anxiety, contemplation, grief, fear, fright)
- Unregulated Eating and Drinking

There may be insufficient yin blood to transform essence and fill the sea of marrow or yang qi debility with loss of spiritual brightness (53-54)." *Video to reflect loss of brightness:*

<https://www.youtube.com/watch?v=BfR9vcM1i6U>

<https://www.youtube.com/watch?v=1QUVMWAscN8>

Traditional Chinese Medicine and the Mind/Brain

Impaired memory and spirit abstraction may also be related to simple heart blood vacuity. If yin fails to control yang, liver yang may become hyperactive and exuberant. These mechanism typically give rise to irritability, vexation and agitation, restlessness, and even hostility and aggression (54).

Less pronounced irritability and taciturnity (reserved in conversation) might be due to liver depression, with or without depressive heart.

Faulty diet as well as heat stewing the juices may result in the engenderment of phlegm dampness that may mist the portals, causing mental confusion and aphasia.

Yin and blood and blood vacuity, fire heat, or phlegm liver depression qi stagnation

Traditional Chinese Medicine and the Mind/Brain

Blood stasis may also be due to heart vacuity, liver blood vacuity, and phlegm obstruction as well as prolonged sitting and inactivity.

Typically several of these disease mechanisms combine in any given patient.

In Chinese Medicine, the brain is an outgrowth of and is nourished by the kidney (Dharamananda). It is thought that taking kidney tonics can aid in preventing brain deterioration.

Traditional Chinese Medicine and the Mind/Brain

Rich agents to nourish the kidney and aid in brain function:

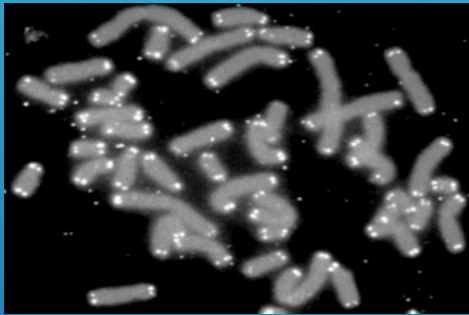
Placenta (Zi He Che), rehmannia (Shu di Huang), cistanche (Rou Cong Rong); kidney essence astringents, such as rose fruit (Hong Jing Tian) and schizandra (: and qi and blood tonics that ultimately help nourish the essence, such as astragalus, polygonatum, and tang-kuei (aka dong quai or female ginseng).

Cognitive functions of the brain are regulated by the heart-the kidney provides the substance, the heart the regulations of activity.

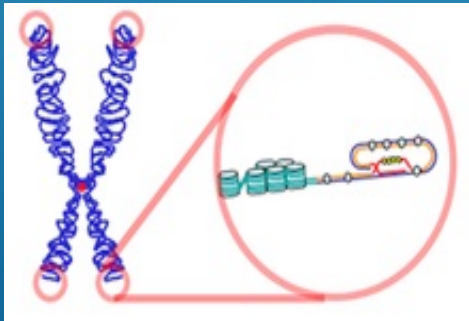
If the heart is agitated, memory, cognition, and wisdom can become disordered or if phlegm blocks the orifices that connect the heart with the brain, the same can occur.

The Aging Brain and Telomeres

As early as the mid-twenties, a variety of age-related changes can begin to occur in the brain. Some of these changes include impaired neurotransmitter signaling, accumulation of neurofibrillary tangles, and a reduction in brain volume. These changes may be present with or without cognitive symptoms.



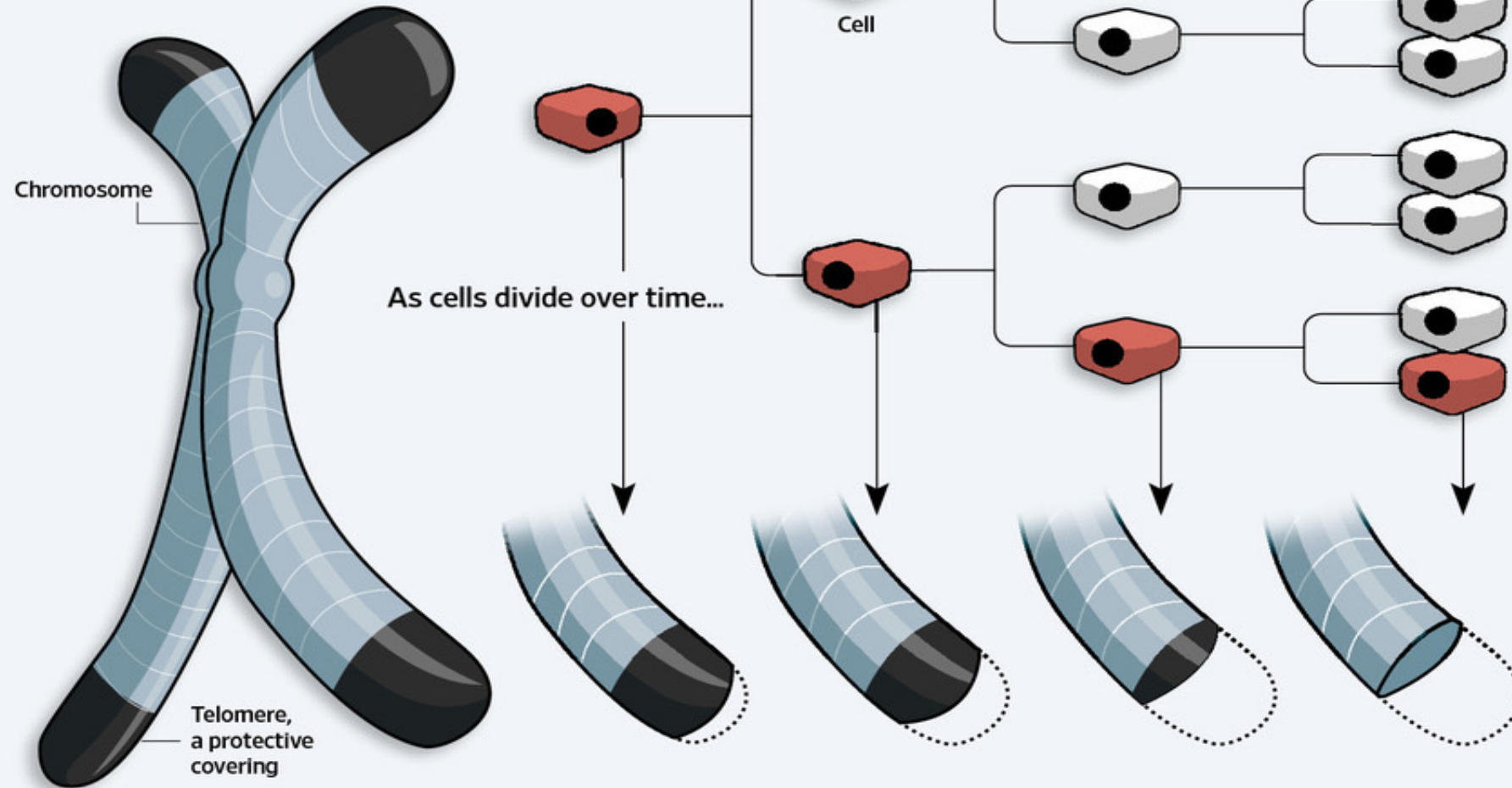
Human chromosomes (grey) capped by telomeres (white)



Telomere = end of chromosome or the length of the DNA.

What We Lose With Age

As we grow older, telomeres at the end of our chromosomes shrink. New research suggests major depression also is linked to shorter telomeres, a sign of 'accelerated aging.'



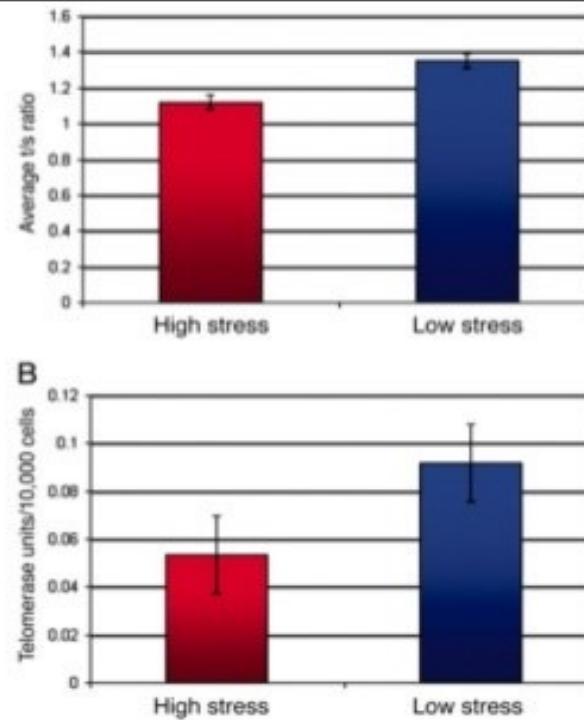
Source: WSJ research

...telomeres shorten, and eventually cell division stops.

The Wall Street Journal

Telomere Length and Telomerase Activity

High-stressed caregivers age prematurely



High-Stressed group had aged the equivalent of 9-17 additional years

Epel, E. S., Blackburn, E. H., Lin, J., Dhabhar, F. S., Adler, N. E., Morrow, J. D., & Cawthon, R. M. (2004). Accelerated telomere shortening in response to life stress. *Proceedings of the National Academy of Sciences of the United States of America*, 101(49), 17312-17315.

The Aging Brain and Telomeres

<https://www.youtube.com/watch?v=yJXTXN4xrl8>

Researchers at Stanford and UCSF have found a link between hippocampal volume in humans and the length of leukocyte telomeres, the protective caps at the ends of white blood cells.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5287208/>

Many studies have shown that short telomere length in white blood cells predicts cognitive decline. In the future, it is thought that we might be able to modulate telomere length which would reduce vulnerability to dementia, but for now, blood telomere length can be seen as a reliable predictor of diseases of aging.

Physical and Chemical changes in the Aging Mind/Brain

The effects of aging on the brain and cognition are widespread and have multiple etiologies:

- Molecules
- Cells
- Vasculature
- Gross morphology
- Cognition

Brains shrink in volume (particularly in the frontal cortex).

Vasculature ages and blood pressure raises the possibility of stroke; ischemia increases; white matter develops lesions.

- Memory decline
- Brain activation becomes more bilateral for memory tasks

Genetics, neurotransmitters, hormones, and experience all have a part to play in brain aging.

Physical and Chemical changes in the Aging Mind/Brain

Protective Factors:

- Higher levels of education or occupational attainment
- Healthy diet, low to moderate alcohol intake, and regular exercise

Physical Changes:

Volume of the brain and/or its weight declines with age at a rate of around 5% per decade after age 40 with the actual rate of decline possibly increasing with age particularly over age 70.

Physical and Chemical changes in the Aging Mind/Brain

- Shrinking of the grey matter: reported to stem from neuronal cell death
- Suggested that a decline in neuronal volume (rather than #) contributes to the changes in an aging brain
- Changes in dendritic arbor, spines, and synapses; Dendritic sprouting may occur: maintaining a similar number of synapses and compensating for any cell death.
- Conversely a decrease in dendritic synapses or loss of synaptic plasticity has also been described.

Physical and Chemical changes in the Aging Mind/Brain

Cognitive Change:

- *Memory – four sections:*
 - ❖ episodic memory
 - ❖ semantic memory
 - ❖ procedural memory
 - ❖ working memory
- *Episodic memory – most important*
 - ❖ Information is stored with 'mental tags', about where, when and how the information was picked up
 - ❖ Episodic memory performance is thought to decline from middle age onwards.

Physical and Chemical changes in the Aging Mind/Brain

- ❖ semantic memory: category of long-term memory: Factual info. like math and algebra
- ❖ procedural memory: category of long-term memory: recollection with no direct conscious awareness; motor action like swimming or riding a bike
- ❖ working memory: limited capacity store for for retaining info. For a brief time *important for reasoning, learning and comprehension.

Physical and Chemical changes in the Aging Mind/Brain

Chronic Stress:

Chronic stress accumulated over the years proliferates aging in a number of ways including overproduction of cortisol and shortening of telomeres.

Long-term or chronic stress, can results in changes in neuronal function= Up regulation of biomarkers of inflammation, increased production of free radicals, increase circulation levels of circulating cortisol, and increase in synaptic glutamate collectively can lead to an increase in aging the brain through metabolic, oxidative, and immunologic stresses.


The stress-brain loop

chronic stress

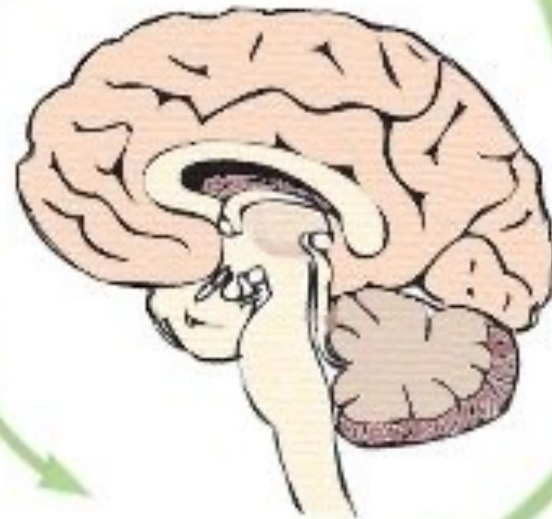
- inadequate sleep
- poor nutrition
- emotional distress

increases
glucocorticoids

decreased regulation
of cortisol

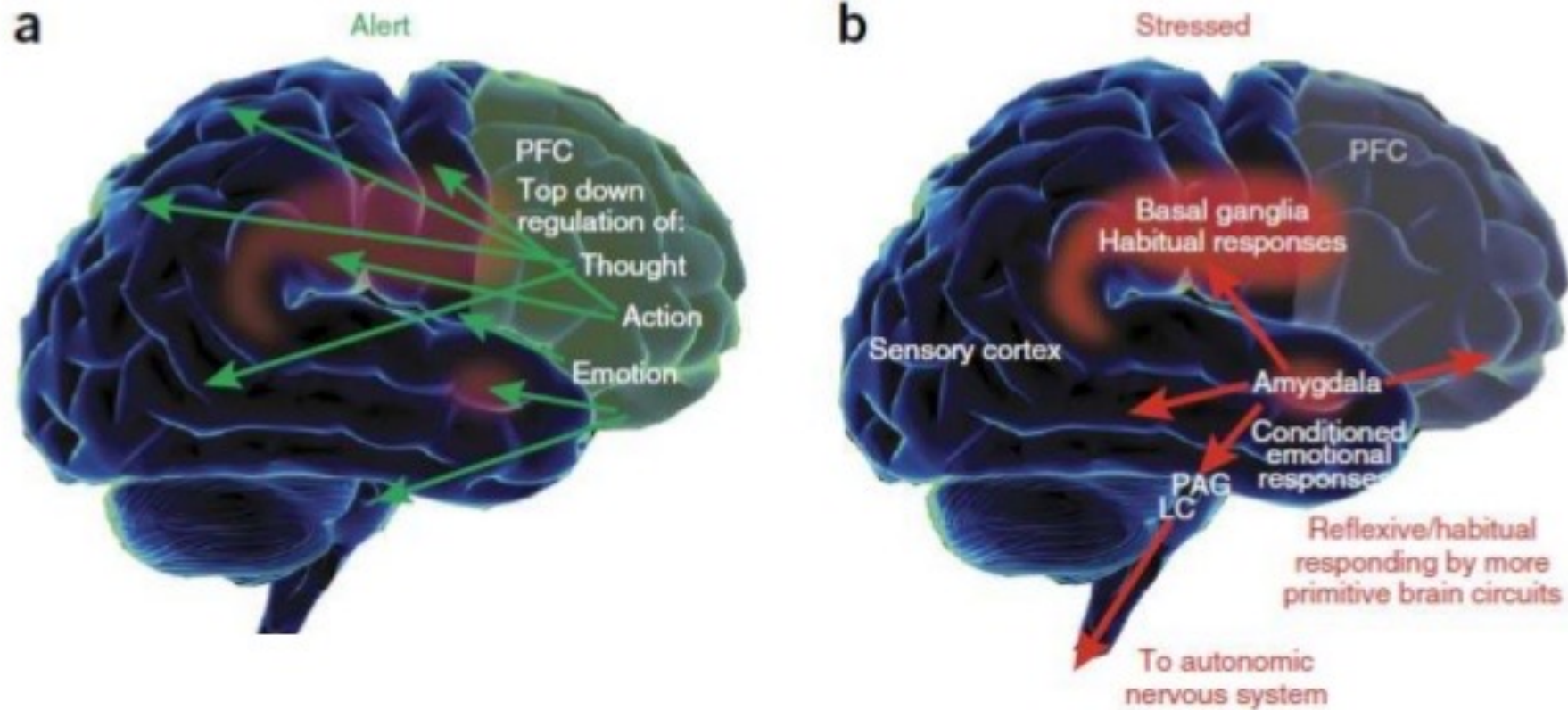
- 
- ↓ attention
 - ↓ perception
 - ↓ short-term memory
 - ↓ learning
 - ↓ word finding

cellular changes in
the hippocampus



© Women's Health Network

Stress Weakens Prefrontal Networks



Physical and Chemical changes in the Aging Mind/Brain

Memory Loss:

1. Mild forgetfulness (taking longer to comprehend something new, or misplacing objects) can be part of normal aging if the ability to uphold Activities of Daily Living (ADL's) is not affected.
2. More severe memory lapse, but less severe than Alzheimer's is classified as Mild Cognitive Impairment (amnesic or non-amnesic).
3. The loss of memory, thinking, and reasoning skills is dementia and Alzheimer's is a form of dementia.

Studies say losing mental capacity is the biggest fear people have about aging, more so than any health condition. ("Healthy Aging/Boomer General Population Survey," Natural Marketing Institute, 2008).

Physical and Chemical changes in the Aging Mind/Brain

The Immune System and Aging

Overview of the Immune System Video:

<https://www.youtube.com/watch?v=zQGOCcOUBi6s>

The lymphatic vessels were detected in the meninges, the protective membranes that cover the brain, and found to closely follow blood vessels.

It is now known that lymphatic vessels are present in the brain and conditions such as multiple sclerosis, Alzheimer's and autism, may be linked to changes in the immune system function.

Physical and Chemical changes in the Aging Mind/Brain

The Immune System and Aging

There is a link to the immune system(via the gut), to the brain. Microbial life in the gut, may also communicates with your brain, via what's known as the “gut-brain axis.”

Embedded in the wall of your gut is your enteric nervous system (ENS), which works both independently of and in conjunction with the brain in your head.

Several white lines of varying lengths and angles are drawn in the bottom right corner of the slide, creating a modern, abstract graphic element.

Physical and Chemical changes in the Aging Mind/Brain

The Immune System and Aging

Communication between your "two brains" runs both ways and is the pathway for how foods affect your mood or why anxiety can make you sick to your stomach, for instance. However, this gut-brain connection is about far more than just comfort food or butterflies in your stomach.

According to Scientific American:

"The gut-brain axis seems to be bidirectional—the brain acts on gastrointestinal and immune functions that help to shape the gut's microbial makeup, and gut microbes make neuroactive compounds, including neurotransmitters and metabolites that also act on the brain."

Physical and Chemical changes in the Aging Mind/Brain

The Immune System and Aging

Nutrition to Improve your immune system:

Astragalus: antibacterial and anti-inflammatory properties; immunomodulation via astragaloside, flavonoids, and saponins,

Reishi: control of blood glucose levels, modulation of the immune system, hepatoprotection, bacteriostasis, and more.

Cordyceps: bidirectional modulator with both potentiating and suppressive effects on the immune system through regulating innate and adaptive immunity

**Three Brothers* (combo of wild cordyceps, astragalus, and codonopsis pilosula root)

**STR-12* (<https://jingherbs.com/collections/immune-support/products/str-12-powder-250-grams>) Low Glycemic

Physical and Chemical changes in the Aging Mind/Brain

The Immune System and Aging

Nutrition to Improve your immune system:

***Fermented Foods:** enhancing natural killers cell toxicity, enhance the production of pro-inflammatory cytokines, and increasing the cytotoxic of T lymphocytes

Lemon: anti-bacterial, anti-fungal, anti-viral

Ginger: polyphenols, modulation of genetic and metabolic activities, anti-viral

Garlic: anti-tumor and anti-microbial effects, and show benefit on high blood glucose concentration, affect cardiovascular system

Bone Broth: micronutrient rich, gut protective via collagen, glycine rich for sleep, anti-inflammatory via amino acid profile

Physical and Chemical changes in the Aging Mind/Brain Cont.

The Immune System and Aging

Nutrition to Improve your immune system Cont:

Caution too many or too few calories

Fasting*

Low glycemic diets: <https://www.health.harvard.edu/diseases-and-conditions/glycemic-index-and-glycemic-load-for-100-foods>

Organic foods preferred- trying to avoid pesticides and herbicides and GMO's

Caution processed and refined foods

Avoid any food allergies

Avoiding rancid oils that may trigger inflammation

Caution the top allergens – “Big 8” Top Food Allergens: Long-term consumption of food allergens will weaken the immune system.

Physical and Chemical changes in the Aging Mind/Brain

The Immune System and Aging

“The Big 8” account for 90 percent of all food-allergic reactions in the U.S.: peanuts, tree nuts (e.g., walnuts, almonds, cashews, pistachios, pecans), milk, egg, wheat, soy, fish, and shellfish.

Here is further information on these allergens:

Peanut Allergy



Unexpected sources of peanuts: Sauces such as chili sauce, hot sauce, pesto, gravy, mole sauce, and salad dressing

Physical and Chemical changes in the Aging Mind/Brain

The Immune System and Aging

Unexpected sources of peanuts: Sauces such as chili sauce, hot sauce, pesto, gravy, mole sauce, and salad dressing

Cookies, and hot cocoa

Egg rolls

Potato pancakes

Pet foods

Gourmet pizzas

Asian and Mexican dishes

Vegetarian meat substitute products

Glazes and marinades



Physical and Chemical changes in the Aging Mind/Brain

The Immune System and Aging

Tree Nuts

Unexpected sources of tree nuts:

Salads and salad dressing

Barbecue sauce

Breading for chicken

Pancakes

Veggie burgers

Pasta

Honey

Fish dishes

Pie crust

Mandelonas: peanuts soaked in almond flavoring

Mortadella: may contain pistachios



Physical and Chemical changes in the Aging Mind/Brain

The Immune System and Aging

Milk Allergy

- Deli meat slicers are frequently used for both meat and cheese products.
- Some brands of canned tuna fish contain casein, a milk protein.
- Many non-dairy products contain casein (a milk derivative), listed on the ingredient labels.
- Some meat may contain casein as a binder. Check all labels carefully.
- Many restaurants put butter on steaks after they have been grilled to add extra flavor. The butter is not visible after it melts.
- Baby formulas

Physical and Chemical changes in the Aging Mind/Brain

The Immune System and Aging

Egg Allergy - Unexpected Sources of Egg:

- Eggs have been used to create the foam or milk topping on specialty coffee drinks and are used in some bar drinks.
- Some commercial brands of egg substitutes contain egg whites.
- Most commercially processed cooked pastas (including those used in prepared foods such as soup) contain egg or are processed on equipment shared with egg-containing pastas. Boxed, dry pastas are usually egg-free, but may be processed on equipment that is also used for egg-containing products. Fresh pasta is sometimes egg-free, too. Read the label or ask about ingredients before eating pasta.
- Egg wash is sometimes used on pretzels before they are dipped in salt.

Physical and Chemical changes in the Aging Mind/Brain

The Immune System and Aging

Wheat Allergy - *Unexpected Sources of Wheat:*

Read food labels carefully, even if you would not expect the product to contain wheat. Wheat has been found in some brands of ice cream, marinara sauce, play dough, potato chips, rice cakes, and turkey patties, and at least one brand of hot dogs.



Physical and Chemical changes in the Aging Mind/Brain

The Immune System and Aging

Soy Allergy - *Unexpected Sources of Soy:*

Soybeans and soy products are found in baked goods, canned tuna, cereals, crackers, infant formulas, sauces, and soups.

peanut butter (!)



Physical and Chemical changes in the Aging Mind/Brain

The Immune System and Aging

Fish Allergy - *Unexpected Sources of Fish:*

- Salad dressings
- Worcestershire sauce
- Bouillabaisse / Soup stocks
- Imitation fish or shellfish
- Steaks / Burgers / Meatloaf
- Barbecue sauce
- Asian Foods



Physical and Chemical changes in the Aging Mind/Brain

Herbs to Boost the Immune System

Astragalus Root (Radix Astragali, Huang Qi):

Astragalus Root is one of the best herbs to bolster the ability of your immune system to function. It works by increasing the number of active immune cells, as well as their activity. However, it primarily acts to fortify the already existing immune system and not to attack the pathogenic agents. Therefore it should only be taken while healthy and not during a cold or flu. Some of the other amazing health benefits of astragalus are its powerful anti-inflammatory effects, the ability to increase heart function and prevent heart disease, increase digestive function, improve lung function, aids the adrenals, and opens blood vessels to increase circulation. This herb would be best used for patients who have slightly weaker bodies and get sick easily, or have digestive/breathing complaints.

Physical and Chemical changes in the Aging Mind/Brain

Herbs to Boost the Immune System

Asian Ginseng (Chinese/Korean Ginseng, Panax Araliaceae, Ren Shen):

There are actually over 30 different species of Ginseng, and the Asian Ginseng is the most widely known. However, do not confuse the other species (American, Siberian, Pseudo ginseng) as they will yield different effects. Asian Ginseng is another great immune booster, which works by increasing the effect of all the cells in the immune system, both innate and adapted.

Physical and Chemical changes in the Aging Mind/Brain

Herbs to Boost the Immune System

Asian Ginseng (Chinese/Korean Ginseng, Panax Araliaceae, Ren Shen):

Many athletes also use Ginseng due to its effect of boosting endurance and strength, as well as the ability to boost mental capacity and alertness. Asian Ginseng also has many anti-oxidants to increase heart health and diabetes. Also, it's powerful anti-inflammatory effect helps with many inflammatory conditions. Asian Ginseng is not to be used in healthy individuals for an extended length of time, as it can cause the blood vessels to weaken spontaneous bleeding to happen. Patients who should be taking Asian Ginseng have more cold-type bodies, possibly with cold hands and feet; and, have a weaker heart, and suffer from fatigue.

Physical and Chemical changes in the Aging Mind/Brain

Herbs to Boost the Immune System

American Ginseng (*Panax quinquefolius*, Xi Yang Shen):

1. **Echinacea** - Echinacea is a popular herb that has been identified to boost immunity. Combined with goldenseal, another herb, or enjoyed alone as tea, this member of the daisy family has been found to prevent and treat upper respiratory tract infections as well as the common cold.
2. **Ginseng** - This herb has many varieties. The most commonly studied variety is *Panax ginseng*, also known as Korean ginseng. Its main active component, ginsenosides, has been proven to have anti-inflammatory and anti-cancer properties. Clinical research studies have demonstrated that it may improve immune and psychological functions as well as conditions related to diabetes.

Physical and Chemical changes in the Aging Mind/Brain

Herbs to Boost the Immune System

*American Ginseng (*Panax quinquefolius*, Xi Yang Shen):*

3. **Garlic** - This spice has had a long history of medicinal value. In a recent study conducted by Dr. Ellen Tattelman, an assistant professor at the *Albert Einstein College of Medicine of Yeshiva University*, New York, it was reconfirmed that garlic indeed has cardiovascular, anti-microbial and antineoplastic properties. It's also a perfect spice to use when doing sautéed dishes.

4. **Bell peppers**- This pepper variety does not contain capsaicin, unlike its other feisty cousins. On the contrary, it is sweet and crunchy and contains the carotenoid lycopene, which lowers the risk of cancer; beta-carotene, which is converted to vitamin A; and Zeaxanthin, known to prevent macular degeneration and cataracts.

Physical and Chemical changes in the Aging Mind/Brain

Herbs to Boost the Immune System

*American Ginseng (*Panax quinquefolius*, Xi Yang Shen)*

5. **Ginger** - This herb has been shown to reduce inflammation, cardiovascular conditions, blood clots and cholesterol. In a study, researchers found that animal subjects given ginger extracts had a significant reduction in cholesterol and blood clotting qualities. Moreover, it has been observed to inhibit the behavior of genes connected with inflammation.
6. **Turmeric**- This spice contains curcumin, which has notable antioxidant properties. It also has antibacterial, anti-inflammatory and stomach soothing benefits. It reduces inflammation by stimulating the adrenal glands to increase the hormone that lessens inflammation. Animal studies on this herb have revealed that turmeric protects the liver from the adverse effects of alcohol and certain toxins. Turmeric also helps in digestive problems by stimulating bile flow.

Physical and Chemical changes in the Aging Mind/Brain

Herbs to Boost the Immune System

American Ginseng (*Panax quinquefolius*, Xi Yang Shen)

7. **Ginkgo Biloba**- Ginkgo biloba's leaves contain antioxidant compounds called bilobalides and ginkgolides that protect the body from damage caused by free radicals. Moreover, it has also been found to protect against radiation. In a study using animal subjects, ginkgo was demonstrated to have protected the test subjects against radiation poisoning. The latest research also suggests that extracts of this herb can neutralize oxidizing agents and free radicals caused in the cells due to radiation, thus preventing cell death. In fact, Natural News recently reported that ginkgo extracts reduce brain damage by up to 50 percent.

8. **Reishi or Ganoderma**- This is a bitter mushroom also known as reishi. It has long been a popular herb in Chinese medicine attributed to assisting in longevity and health. Further studies on this oriental herb reveal that it strengthens immunity and combats cancer. Moreover, it has antioxidant properties and provides relief from urinary tract infections.

Physical and Chemical changes in the Aging Mind/Brain

Herbs to Boost the Immune System

*American Ginseng (***Panax quinquefolius***, Xi Yang Shen)*

9. **Astragalus** - Also from China, this herb stimulates the immune system and aids in digestion and adrenal gland functions. It is also a diuretic. The effectiveness of this herb is due to polysaccharides, saponins and flavonoids. It has also been taken to combat the common cold and flu. Its digestive health benefits demonstrate the lowering of stomach acidity, resulting to an increase in the body's metabolic rates and the promotion of waste elimination.

Physical and Chemical changes in the Aging Mind/Brain

Herbs to Boost the Immune System

*American Ginseng (*Panax quinquefolius*, Xi Yang Shen)*

10. **Cat's claw** - This herb from Peru is commonly used for stomach problems. Recently, however, it is becoming known as an exceptional immune response stimulator that helps the body to fight off infections and degenerative diseases. It contains oxindole alkaloids enhancing the immune system's capacity to engulf and destroy pathogens.

11. Other things to consider are: **probiotics and probiotic foods** like sauerkraut, kim chi, kombucha, kefir and yogurt (none dairy)

Recipe Links

Boost the Immune System

<https://www.mushroomrevival.com/blogs/blog/three-delicious-and-easy-reishi-mushroom-recipe>

<https://www.realmushrooms.com/cordyceps-mushroom-recipes/>

<https://www.traditionalmedicinals.com/articles/diy/astragalus-miso-immunity-soup/>

<https://www.everydayhealth.com/diet-nutrition/recipes-that-can-help-strengthen-your-immune-system/>

<https://wellnessmama.com/5888/bone-broth/>

<https://www.culturesforhealth.com/learn/natural-fermentation/how-to-ferment-vegetables/>

<https://minimalistbaker.com/easy-vegan-pesto-5-minutes/>

<https://tastythin.com/instant-pot-healing-chicken-soup-whole30/>

Physical and Chemical changes in the Aging Mind/Brain

Sleep and Aging

Sleep disorders are a pervasive problem throughout all patient populations but represent an especially important health problem for the elderly. Alterations in sleep architecture that occurs as a part of normal aging will contribute to sleep problems as we grow older. Other contributing factors—including comorbid medical conditions, changes in lifestyle and schedule, altered circadian rhythm, among a host of others—can have detrimental effects on the health of the elderly. Coupled with a number of sleep disorders that either emerge or exacerbate with age, the effects of poor sleep often result in an overall worsening of quality of life.


Gleason, K. & McCall, W.V. Curr Psychiatry Rep (2015) 17: 45. doi:10.1007/s11920-015-0583-Z

As we age, as sleep patterns change in such a way that overall sleep time and quality is affected. This may increase pro inflammatory biomarkers in the body.

Physical and Chemical changes in the Aging Mind/Brain

Nutritional strategies for improving sleep

Chinese Nutritional Therapy includes basic advice on healthy eating as well specific food recommendations for each patient. Some points emphasized in Chinese Medicine for better sleep include not eating for at least two to three hours before bedtime, as well as the avoidance of greasy or sweet foods. Chinese Medicine also recommends staying away from cold drinks.

Several white lines of varying lengths and angles are positioned in the bottom right corner of the slide, creating a modern, abstract graphic element.

Physical and Chemical changes in the Aging Mind/Brain

Nutritional strategies for improving sleep

Chinese Herbal Medicine

There are many traditional Chinese herbal formulas to help regulate the sleep pattern. A formula is chosen for each person based on his or her symptoms, constitution, and medical history. It is best to have a licensed medical practitioner select the proper formula. Some herbs that are used in these formulas include Suan Zao Ren (Sour Date Seed), Bai Zi Ren (Arborvitae Seed), Fu Shen (Poria Paradicis), and Wu Wei Zi (Schizandra Fruit).

Huffington Post:

Calming The Shen: A Chinese Medicine Approach To A Good Night's Sleep

04/01/2010 05:12 am ET | **Updated** Nov 17, 2011

Nutritional strategies for improving sleep: Recipes

<https://www.eatingwell.com/gallery/13687/healthy-recipes-for-sleep-enhancing-foods/>

<https://www.purewow.com/food/dinners-for-a-better-nights-sleep>

<https://www.sleepfoundation.org/nutrition/food-and-drink-promote-good-nights-sleep>

PROTEIN HEALTHY FATS COMPLEX CARBS. or NO CARBS TIMING GRATITUDE

Physical and Chemical changes in the Aging Mind/Brain

More on Disease and Inflammation

Many studies have correlated cognitive decline with biomarkers of inflammation. The presence of high levels of C-reactive protein (CRP) and IL-6 are some of the best biomarkers to test.

Other studies have linked abdominal obesity, elevated triglycerides, hypertension, hyperglycemia, and low HDL (commonly found in metabolic syndrome and obesity) likely to have cognitive decline compared to those with no metabolic syndrome.

Physical and Chemical changes in the Aging Mind/Brain

More on Disease and Inflammation

Disease like cancer, heart disease, diabetes, obesity, depression, and dementia have all been linked to chronic, low levels of inflammation. Neurogenesis (the growth and development of nervous tissue) is inhibited by the presence of pro-inflammatory molecules. These molecules can allow direct contact with the brain as the integrity of the blood-brain barrier is disrupted.

Overall, this can lead to premature neuronal death.

Physical and Chemical changes in the Aging Mind/Brain

Anti-Inflammatory Strategies & Nutrients

A person's overall caloric needs and macro-nutrient ratio profile needs to be assessed in order to decrease the change of ingesting too many or too few calories or certain types of calories. *More on this later.

After this step has been taken, food allergies and or sensitivities would something else to investigate in order to reduce inflammation in the body.

Various "types" of diets need to be analyzed.

Physical and Chemical changes in the Aging Mind/Brain

Anti-Inflammatory Strategies & Nutrients

The Mediterranean Diet has been shown to reduce the risk of metabolic syndrome, insulin sensitivity, lipid metabolism, and decrease mortality. Many studies have also found a reduced risk of age-related cognitive decline from the development of Alzheimer's with an adherence of the Mediterranean diet.

Mood improvement, and an increase in cognitive performance have been reported with just a short-term adherence of the Mediterranean diet.

Physical and Chemical changes in the Aging Mind/Brain

Mediterranean Diet

The Mediterranean diet emphasizes eating foods like **fish**, fruits, **vegetables**, **beans**, high-fiber breads and **whole grains**, nuts, and **olive oil**. Meat, cheese, and sweets are very limited.



Physical and Chemical changes in the Aging Mind/Brain

The Role of Nutrients and the mind/brain

Nutrients play a crucial role in the support of our brains and the balance of our minds. First and foremost, sufficient calories and macronutrients need to be considered for each individual at different phases of life. Too much or too little or extreme ratios of certain macronutrients may lead to

Oxidative Stress and Anti-Oxidants

What is oxidation? **By: Dr. Ananya Mandal, MD**

Oxidative stress is an imbalance between the production of free radicals and the ability of the body to counteract or detoxify their harmful effects through neutralization by antioxidants.

Physical and Chemical changes in the Aging Mind/Brain

What are free radicals?

A free radical is an oxygen-containing molecule that has one or more unpaired electrons, making it highly reactive with other molecules.

Oxygen by-products are relatively unreactive but some of these can undergo metabolism within the biological system to give rise to these highly reactive oxidants. Not all reactive oxygen species are harmful to the body. Some of them are useful in killing invading pathogens or microbes.

However, free radicals can chemically interact with cell components such as DNA, protein or lipid and steal their electrons in order to become stabilized. This, in turn, destabilizes the cell component molecules, which then seek and steal an electron from another molecule, therefore triggering a large chain of free radical reactions.

Physical and Chemical changes in the Aging Mind/Brain

What are antioxidants?

Every cell that utilizes enzymes and oxygen to perform functions is exposed to oxygen free radical reactions that have the potential to cause serious damage to the cell. Antioxidants are molecules present in cells that prevent these reactions by donating an electron to the free radicals without becoming destabilized themselves. An imbalance between oxidants and antioxidants is the underlying basis of oxidative stress.

Damaged caused by oxidative stress

Oxidative stress leads to many pathophysiological conditions in the body. Some of these include neurodegenerative diseases such as Parkinson's disease and Alzheimer's disease, gene mutations and cancers, chronic fatigue syndrome, fragile X syndrome, heart and blood vessel disorders, atherosclerosis, heart failure, heart attack and inflammatory diseases.

Physical and Chemical changes in the Aging Mind/Brain

Anti-Oxidant Foods and Supplements

Polyphenols are among the most potent antioxidants found in nature.

The European Journal of Clinical Nutrition has published a list of the 100 richest dietary sources of polyphenols, based on milligrams (mg) per 100 grams (g) or 100 mg of food.

NEXT are 20 foods topping that list:

Cloves	Peppermint	Star anise	Raw cacao
Mexican oregano	Celery seed	Dark chocolate	Flaxseed meal
Black elderberry	Chestnut seeds	Dried sage	Rosemary
Spearmint	Thyme	Blueberries	Blackcurrant
Capers	Black olive	Hazel nuts	Pecans

Physical and Chemical changes in the Aging Mind/Brain

Anti-Oxidant Foods and Supplements

Cacao:

- Theobromine, a bioactive compound found within cacao can improve brain function
- Flavonoids in cacao promote neurogenesis, angiogenesis, and can change the neuron morphology in regions of the brain involved in learning and memory.
- Dosing Guides according to the Institute for Brain Potential: dark, unsweetened cacao, at least 70% with a dose near 10grams/day.

Physical and Chemical changes in the Aging Mind/Brain

Anti-Oxidant Foods and Supplements

Blueberries

- Bioactives in blueberries have been shown to improve insulin sensitivity in obese men and women, improve memory in older adults, reduce oxidative stress and inhibit the enzyme that breaks down acetylcholine.
- Dose: One study showing a successful outcome in brain health used the following dose of fresh pressed, wild blueberry juice: Daily consumption was maintained between 6 mL/kg and 9 mL/kg by using a dosing schedule determined by body weight. Individuals weighing 54 to 64 kg were prescribed 444 mL/day, those weighing between 65 and 76 kg consumed 532 mL/day, and those weighing between 77 and 91 kg consumed 621 mL/day. ROBERT KRIKORIAN, MARCELLE D SHIDLER, TIFFANY A NASH, WILHELMINA KALT, MELINDA R VINQVIST-TYMCHUK, BARBARA SHUKITT-HALE, and JAMES A JOSEPH: Blueberry Consumption Improves Memory in Older Adults. (April 15, 2010). *Journal of Agriculture and Food Chemistry*. 58(7). 3996-4000.

*Other studies show that one serving or two handfuls each day is a good dose for most adults.

Physical and Chemical changes in the Aging Mind/Brain

Anti-Oxidant Foods and Supplements

Resveratrol: This is a flavonoid antioxidant found in the grape skin.

- Cerebral circulation was shown to be enhanced in one study with a dose of 250-500mg.
- Resveratrol may benefit the brain by suppressing inflammation
- Red wine has been shown to improve cognition in several studies. *Other studies using moderate alcohol alone, without resveratrol have also shown to improve cognitive function.
- Grape juice (void of alcohol) has shown to improve cogitation in healthy older human subject after 12 weeks of consuming Concord grape juice. (26)

Physical and Chemical changes in the Aging Mind/Brain

Anti-Oxidant Foods and Supplements

Alpha Lipoic Acid(ALA): This is a mitochondrial fatty acid used as a cofactor in the synthesis of ATP.

- ALA, high in anti-oxidant content and anti-inflammatory agents, has been used in treating chronically elevated blood-glucose and as part of a treatment plan for diabetic neuropathy.
- Hager, Marahrens, Kenklies, Riederer, and Munch found in their study titled "*Alpha-lipoic acid as a new treatment option for Alzheimer type dementia*," (Archives of Gerontology and Geriatrics. 2001; 32(3): 275-282) found that a daily dose of 600mg given over the course of a year, led to significant improvements in cognition and activates of daily living
- Maczurek, Hager, Kenklies, et al., in their study titled "*Lipoic acid as an anti-inflammatory and neuroprotective treatment for Alzheimer's disease*" (Advanced Drug Delivery Reviews, 2008;60(13-14): 1463-1470) found that 600mg dose of ALA slowed the progression of the disease, but only in patients with mild symptoms
- A dose of 300-900mg/day is recommend for enhancing overall vascular health from the Institute for Brain Potential. *ALA also acts synergistically with L-carnitine.

Physical and Chemical changes in the Aging Mind/Brain

Anti-Oxidant Foods and Supplements

Coenzyme Q10: Serves as an electro carrier in the mitochondria where ATP synthesis occurs

- Research has shown that lack of CoQ10 results in less cellular energy.
- Statin drugs deplete levels of CoQ10
- Studies have demonstrated that supplementation of CoQ10 is beneficial in Parkinson's Disease, Huntington's Disease, and Amyotrophic Lateral Sclerosis.
- Recommended dose from the Institute for Brain Potential is 100-300mg/day

Physical and Chemical changes in the Aging Mind/Brain

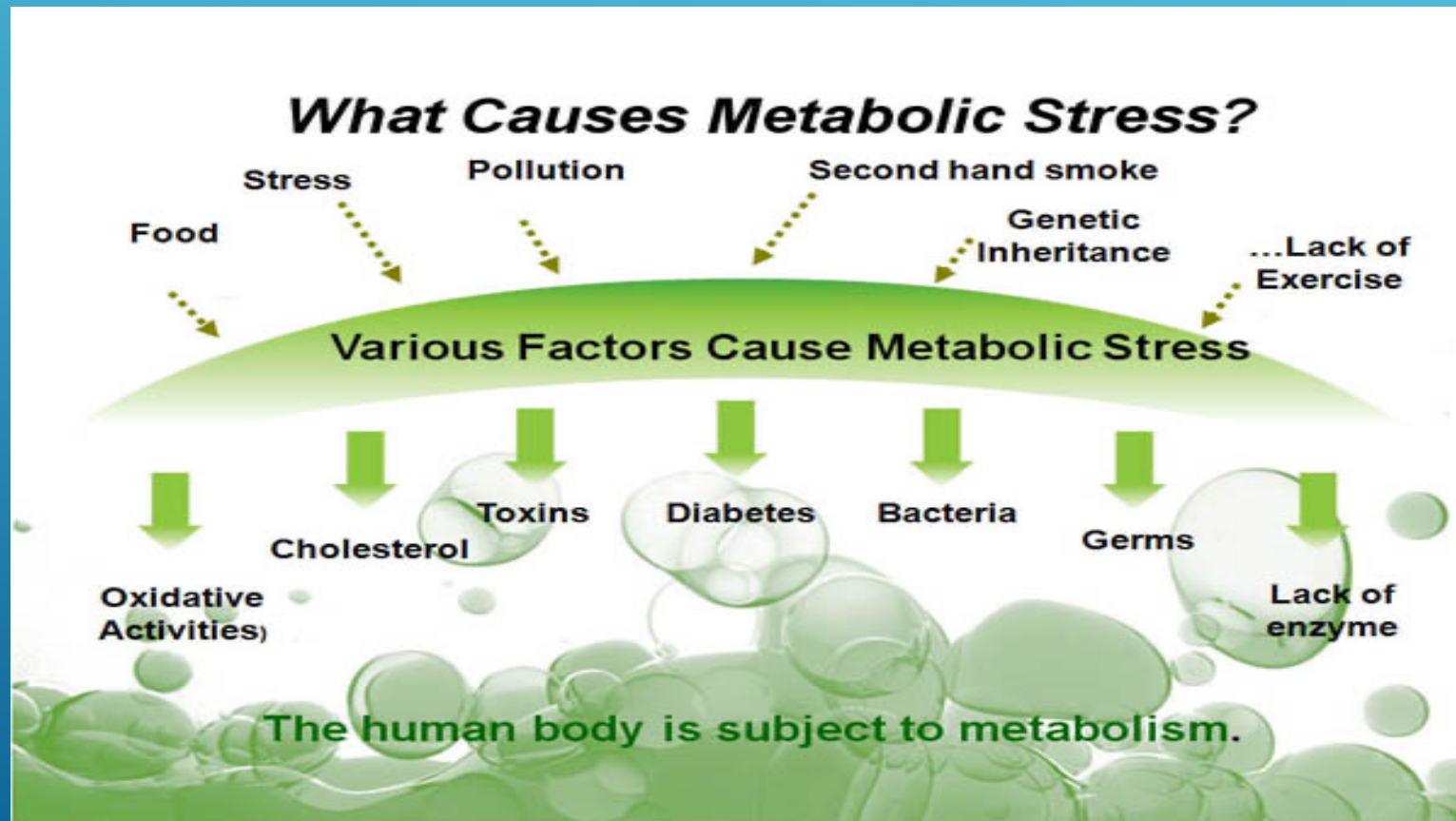
Anti-Oxidant Foods and Supplements

Acetyl-L-Carnitine: The essential amino acids lysine and methionine form carnitine.

- Used as a supplement in stroke and type-2 diabetes as it can act as an endothelial protective agent and enhance blood flow.
- A study titled *Meta-Analysis of double blind randomized controlled clinical trials of acetyl-L-carnitine versus placebo in the treatment of mild cognitive impairment and mild Alzheimer's disease* using over 1,200 subjects showed that a dose range from 1.5-3 g/day preserved cognitive function and or slowed decline of mental capacity.

Physical and Chemical changes in the Aging Mind/Brain

Metabolic Stress



Physical and Chemical changes in the Aging Mind/Brain

Metabolic Stress

Metabolic stress is defined as chronic imbalance between energy intake and expenditure that leads to cellular dysfunction and premature aging.

Stress: Any threat to a person's well being

Pathological stresses:

Disease and trauma (physical insult such as bone fractures, wounds, burns, and surgery)

Severe pathological stresses:

Cause hormonal and metabolic changes that alter nutrient needs. (Serious infections, major tissue damage, extensive surgery and severe burns)

Stress Response: The body's adaptive response to severe stress, mediated by immune, inflammatory, and hormonal mechanisms.

Physical and Chemical changes in the Aging Mind/Brain

Nutrients that help brain metabolism

Cinnamon (Gui Zhi):

- Cinnamon is metabolized into sodium benzoate. Eating cinnamon significantly elevates the level of sodium benzoate in your brain. A recent report in the Journal of Neuroimmune Pharmacology by researchers from Rush University Medical School in Chicago found that sodium benzoate has many important positive effects upon brain function and that eating cinnamon may prevent a variety of age-related neurological disorders. **How?**

Physical and Chemical changes in the Aging Mind/Brain

Nutrients that help brain metabolism

Cinnamon (Gui Zhi):

- The sodium benzoate produced in the body after eating cinnamon induces significant increases in the levels of a variety of chemicals in the brain called neurotropic factors. These factors stimulate the birth of new neurons in the brain and encourage the survival of existing neurons. These two processes are critical for the maintenance of a healthy brain. During the past decade many scientific studies have discovered that these neurotropic factors can prevent, or greatly slow the progression of, a variety of degenerative diseases of the brain, including Alzheimer's and Parkinson's disease.
- Cinnamon also has been shown to improve lipid profiles, decrease hyperglycemia, and reduce markers of inflammation overall, helping to reduce the symptoms of metabolic syndrome.
- Many studies have shown that for anti-diabetic effects, a dose of 1-6 grams/day is beneficial.

Physical and Chemical changes in the Aging Mind/Brain

Nutrients that help brain metabolism

Berberine: A plant alkaloid used in Traditional Chinese Medicine: (Huang Bai and Huang Lian) Berberine is a quaternary ammonium salt from the protoberberine group of benzyloquinoline alkaloids. It is found in such plants as Berberis, Mahonia aquifolium, Hydrastis canadensis, Xanthorhiza simplicissima, Phellodendron amurense, Coptis chinensis, Tinospora cordifolia, Argemone mexicana, and Eschscholzia californica. Berberine is usually found in the roots, rhizomes.

- a. Similar actions to the diabetes drug metformin as it activates Protein Kinase AMPK: a nutrient and energy sensor that becomes active with fluctuations in the ratio of AMP: ATP-regulates the uptake of glucose.
- b. Doses ranging from 300-400mg 3-4x/day were found to be just as effective as oral hypoglycemic in the management of diabetes.

Physical and Chemical changes in the Aging Mind/Brain

Nutrients that help brain metabolism

Coffee & caffeine:

- Coffee may slow the progress of Alzheimer's disease. A Florida study found that when older people with mild cognitive impairment were tested initially and then again two to four years later, the ones with high blood caffeine—equivalent to about 3 cups of coffee—were far less likely to have developed full-blown Alzheimer's disease.
- Coffee may help you live longer. A large-scale study involving over 400,000 older adults found that men who drank 2 cups of coffee a day lived 10% longer than their coffee-free cohorts. Among women, the figure was even higher; the coffee drinkers lived an average of 13% longer than their uncaffeinated peers.
- Coffee may help prevent Parkinson's disease – and can reduce the visible symptoms if you already have it. Studies have shown that coffee drinkers are less likely to develop Parkinson's, and for those that have the disease, coffee intake has been found to help with movement symptoms like tremors.

Physical and Chemical changes in the Aging Mind/Brain

Nutrients that help brain metabolism

Coffee & caffeine – cont.:

- Animal experiments have found that caffeine can disrupt adenosine, a cell chemical that can start a chain reaction that leads to a disruption of neuron function, neurdegeneration, and eventual dementia.
- Coffee is one of the best sources of neuroprotective antioxidants available. While things like blueberries and pomegranates are most often touted for their antioxidant content, it turns out our cup of morning Joe is brimming with antioxidants. Research has found that it is the number one source of antioxidants in most people's diets, by a large margin.
- Dose: Many of these studies used 3-5 cups coffee per day in their protocol.

Physical and Chemical changes in the Aging Mind/Brain

Nutrients that help brain metabolism

Medium Chain Triglycerides (MCT's): This group of fats are saturated fatty acids containing 6-12 carbon atoms and unlike longer-chain fatty triglycerides found in many other common sources of fats, MCT's penetrate the blood brain barrier.

- MCT's can help with weight loss by increasing energy expenditure (less reliance of carbohydrates) and increasing the feeling of fullness.
- Recent studies have found MCT's to help with memory impairment, mood, cognition * especially with people who have glucose abnormalities.
- Some studies have used coconut oil (an MCT oil) to induce ketosis in subjects, which is shown to improve cognitive function.
- Dose: 5-20g/day of coconut oil was used in many of the studies to induce mild ketosis.

Physical and Chemical changes in the Aging Mind/Brain

Nutrients that help brain metabolism: RECIPES

<https://www.bulletproof.com/recipes/keto-recipes/mct-oil-recipes-2b2g3c3g3w4b6b-160419/>

<https://allthenourishingthings.com/mct-oil-recipes-that-arent-bulletproof-coffee/>

<https://sweetsimplevegan.com/2014/07/memory-boosting-bliss-balls/>

<https://www.wellandgood.com/recipes-with-cinnamon/>

<https://www.acouplecooks.com/10-brain-food-recipes-to-boost-your-mood/>

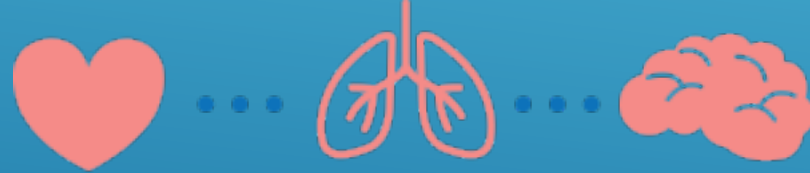
**Modify these recipes according to food allergies and glycemic response*

Physical and Chemical changes in the Aging Mind/Brain

More Strategies for Protecting the Aging Mind

Exercise

Exercise increases neurogenesis and helps the brain against pathogenic stress.



Exercise affects the brain on multiple fronts. It increases heart rate, which pumps more oxygen to the brain. It also aids the bodily release of a plethora of hormones, all of which participate in aiding and providing a nourishing environment for the growth of brain cells.

Exercise stimulates the brain plasticity by stimulating growth of new connections between cells in a wide array of important cortical areas of the brain. Recent research from UCLA demonstrated that exercise increased growth factors in the brain—making it easier for the brain to grow new neuronal connections.

Physical and Chemical changes in the Aging Mind/Brain

More Strategies for Protecting the Aging Mind

Exercise – cont.:

Exercise affects the brain on multiple fronts. It increases heart rate, which pumps more oxygen to the brain. It also aids the bodily release of a plethora of hormones, all of which participate in aiding and providing a nourishing environment for the growth of brain cells.

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Physical and Chemical changes in the Aging Mind/Brain

More Strategies for Protecting the Aging Mind

Exercise – cont.:

Aerobic exercise has been shown to increase brain volume in aging humans. 30 minutes of sustained aerobic exercise at 75% of maximum heart rate 5 times per week is recommended.

Resistance training can improve short-term memory and activate pathways that are crucial for cell growth and development. 75-85% 1 rep max (10-15 total reps) once per week is recommended.



Physical and Chemical changes in the Aging Mind/Brain

More Strategies for Protecting the Aging Mind

Intermittent Fasting and or Caloric Restriction:

Hypotheses linking caloric restriction to cognitive capability include anti-inflammatory mechanisms, reduction of neural oxidative stress, promotion of synaptic plasticity, and induction of various stress and neurotropic/neuroprotective factors. Caloric restriction may also prevent beta-amyloid neuropathology in Alzheimer transgenic models. Finally, both exercise and caloric restriction enhance neurogenesis via different mechanisms suggesting that their combination may decrease the risk of neurodegenerative disease.

Calorie restriction (CR), or caloric restriction, or energy restriction, is a dietary regimen that reduces calorie intake without incurring malnutrition or a reduction in essential nutrients. "Low" can be defined relative to the subject's previous intake before intentionally restricting calories, or relative to an average person of similar body type. Typically 30-60% decrease in calories without malnutrition is the standard for calorie restriction.

Physical and Chemical changes in the Aging Mind/Brain

More Strategies for Protecting the Aging Mind

Intermittent Fasting and or Caloric Restriction – cont.:

Intermittent fasting: has shown improvements in blood glucose, lipid profiles, and cognitive function by reducing inflammatory markers and enhancing insulin signals and increasing Brain Derived Neurotropic Factor.

Every other day fasting or at a minimum 12 hour fasting would be recommended.

Longer fasting may be required by certain individuals.

Brain Games

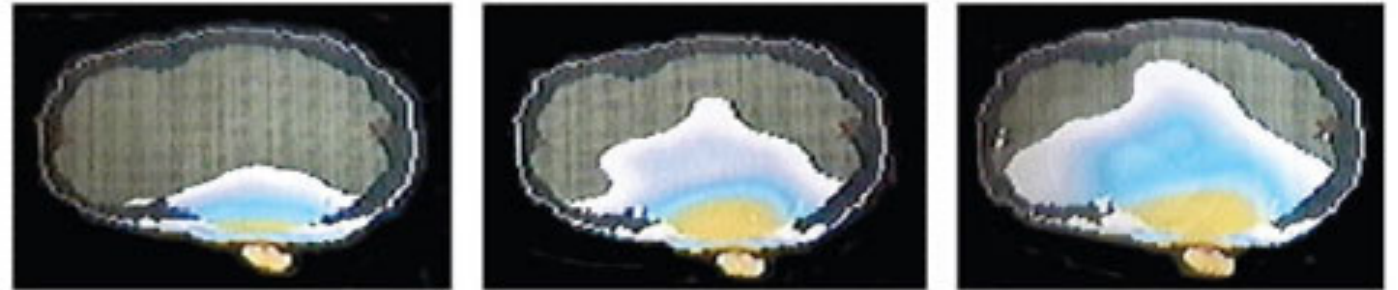
The jury is still out! <http://www.npr.org/sections/health-shots/2016/10/03/496120962/brain-game-claims-fail-a-big-scientific-test>.

Physical and Chemical changes in the Aging Mind/Brain

More Strategies for Protecting the Aging Mind

Electromagnetic Frequency: EMF's

Cell Phone Radiation Penetrating Skull



ADULT Head

CHILD - 10 Years Old

CHILD - 5 Years Old

Study by Gandhi et al. University of Utah, 1996.

1. Children **absorb** more **energy** than adults from the same phone.
2. Tumors in **mid brain** are more deadly than those in **temporal lobe**.
3. Children's **cells** are **reproducing** more quickly than adults.
4. Children's **immune system** is not as well developed as adults.
5. Longer potential for **life-time exposure** for children than adults.

Physical and Chemical changes in the Aging Mind/Brain

More Strategies for Protecting the Aging Mind

Electromagnetic Fields Can Damage Cells and DNA Via Cellular Stress Responses

Video: <https://vimeo.com/17266941>

Research by Martin Blank, Ph.D., a Special Lecturer and retired Associate Professor at Columbia University in the Department of Physiology and Cellular Biophysics and former president of the Bioelectromagnetics Society (15) explains that electromagnetic fields (EMF) damage your cells and DNA by inducing a cellular stress response.

He gave an informative speech at the November 18, 2010 Commonwealth Club of California program, "[The Health Effects of Electromagnetic Fields](#)," co-sponsored by ElectromagneticHealth.org (embedded above for your convenience).

Physical and Chemical changes in the Aging Mind/Brain

More Strategies for Protecting the Aging Mind

Electromagnetic Fields Can Damage Cells and DNA Via Cellular Stress Responses

- Children should never use cell phones.
- Reduce your cell phone use.
- Use a land line at home and at work.
- Reduce or eliminate your use of other wireless devices.
- Limit your cell phone use to where reception is good.
- Do not assume one cell phone is safer than another.
- Keep your cell phone away from your body when it is on.
- Respect others who are more sensitive: children pregnant women, elderly, brain injured, chronically ill
- Use safer headset technology.

Physical and Chemical changes in the Aging Mind/Brain

More Strategies for Protecting the Aging Mind

Diets Shown to increase life-span: Okinawa Diet:

The Okinawa diet is named after the largest island in the Ryukyu Islands in Japan. History buffs might recognize the name from the Battle of Okinawa, fought during World War II. But these days, there's another reason it's in history books: Okinawa's people live a really, really long time.

While the average life expectancy in the United States is 78.8 years, it's 84 years old in Japan – and five times as many people from Okinawa live to be 100 years as their peers in the rest of the country. Researchers have studied the Okinawa's residents for years, and the answer lies both in the typical Okinawan diet and the islands' attitude toward eating.

Physical and Chemical changes in the Aging Mind/Brain

More Strategies for Protecting the Aging Mind

Diets Shown to increase life-span: Okinawa Diet:

What Okinawans eat -

The Okinawa diet gets back to basics. It emphasizes a diet rich in yellow, orange and green vegetables. While rice is ever-present with mealtime in Japan, they skimp on the grains and focus instead on the purple sweet potato. Meat (including pork), dairy and seafood are eaten in small amounts, and there's an emphasis on soy and legumes.

The entire diet is quite low in sugar and grains – Okinawans consume about 30 percent less sugar and 15 percent fewer grains than folks in the rest of Japan.

Eating mindfully and slowly in this way means that Okinawans take the time to think about what and how they're consuming their food. By checking in with themselves to decide if they have achieved satiety before continuing to eat, they give their bellies time to signal the brain and let them know they're full. This strategy pays off. Okinawans typically eat about 1,200 calories a day, a lot fewer than the average 2,000 recommended in the U.S. But because the foods they consume are so nutrient-rich and Okinawans are used to caloric restriction (not starvation mode!), they're able to stay healthy and live longer on less.

Physical and Chemical changes in the Aging Mind/Brain

More Strategies for Protecting the Aging Mind

Other Supplements: Endless supplements are on the market for brain health:

A search on Emerson's Ecologics using the search term brain resulted in over 39 results and using the search term mind, search term metal will give another 9 products and search term longevity will give over 29 results. A Google search for "supplements for brain health" will give you over 21,000,000 results.

A PubMed search using the search terms "supplements for brain health" resulted in 616 articles.

Here are a few supplements:

- Pinella Brain-Nerve Cleanse (Nutramedix, Inc.)
- Brain Calm (Douglas Labs)
- Brain Vitale (Designs For Health)
- Brain Memory (Vinco)
- Brainstorm (Allergy Research Group)

Physical and Chemical changes in the Aging Mind/Brain

More Strategies for Protecting the Aging Mind

Here are a few supplements – cont.:

- Cognitex (Life Extension)
- Brain Vibrance Supreme (Crayhon Research)
- ProThrivors Wellness Brain (Integrative Therapeutics)
- Vital Brain (Vital Nutrients)
- BrainWave (Nutricology)
- BrainAid (Nutricology)
- Brain Cell Support (Metabolic Maintenance)
- Brain Beef (Allergy Research Group)
- Brain Shield (Life Extension)
- Brain Regain (Protocol For Life Balance)
- Brain Mood (Douglas Labs)

CASE STUDIES



LABS

<https://www.cyrexlabs.com/>

https://www.gdx.net/news/genova-nutritional-testing?nutrition042021&gclid=CjwKCAjwoZWHBhBgEiwAiMN66e-APTCcpKpD_alHtkhQAGz4clxaNSNKVpH6wSlbd-kfOvT98Qd6JxoCP4YQAvD_BwE

<https://www.spectracell.com/micronutrient-test-panel>

https://questdirect.questdiagnostics.com/?utm_source=google&utm_medium=cpc&utm_campaign=71700000052694338&utm_content=58700005049377770&utm_term=p55595415715&gclid=CjwKCAjwoZWHBhBgEiwAiMN66UQ5QjRVrNHlznFFJ8ff-jrrCeBXiK4rHW1pLqtuFyZZaqaObBVvhhoCgh4QAvD_BwE&gclsrc=aw.ds

<https://www.directlabs.com/>

<https://dutchtest.com/>

QUESTIONS

COMMENTS CONCERNS

**MY SINCERCE GRATITUDE AND THANKS FOR ELEVATING YOUR EDUCATION TO BETTER
SERVE YOUR PATIENTS**

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