The Smarter Way to Help Keep Your Brain Healthy and Mentally Sharp

The human brain is without parallel regarding efficiency, complexity, and dynamic performance. It can perform the equivalent of an exaflop—a unit of measurement for a supercomputer's performance. In other words, a billion-billion (1 followed by 18 zeros) mathematical operations per second — with a mere 20 watts of power. That means you're walking around with the equivalent of a supercomputer above your shoulders.[1]

The human brain contains approximately one hundred billion neurons, about the same number of stars in the Milky Way galaxy. These neurons are connected by trillions of connections or synapses.

Although the brain is a powerful tool, it loses its ability to function at full speed as you age or suffer from illness all too frequently. Lack of brain power as we grow older means a loss of independence for you and your loved ones.

Thus, what have you done specifically to fuel your brain and conserve its incredible functional capacity? In this white paper, I'll show you what you need to do to keep your brain healthy and mentally sharp, whether you're a student who wants to ace a test, a business executive who needs to stay focused and on task, or an aging person who wants to keep doing what you love to do as you age.

I will show you how an innovative brain support supplement can team up with brain-boosting lifestyle measures. Knowledge is power, and it's time to become empowered by reading this white paper.

Awesome Facts about the Brain

Appreciating the structure and function of our brains is essential, as it gives us a deep appreciation of why we should never take our brain and its performance for granted. These facts are inspirational and emphasize why we must proactively nourish our minds:

- With each heartbeat, your arteries carry 20 to 25 percent of your blood to the brain.
- Every minute, 750-1,000 milliliters of blood flows through the brain. This is enough to fill a bottle of wine or a liter bottle of water.
- The brain has 100 billion neurons (nerve cells).
- These neurons branch out to 100 trillion-plus trigger points, forming what experts call a "neuron forest."
- A mind-boggling 100,000 miles of blood vessels fuel the brain. The distance around the world at the equator is 24,900 miles.
- Adults who take part in activities that challenge their minds were 63 percent less likely to develop dementia.[2]
- The harder you think, the more oxygen and fuel your brain will use from your blood – up to 50 percent.
- Research has shown that those who are highly physically fit are 90 percent less likely to develop dementia than women who are moderately physically fit.[3]

Dementia Statistics

Dementia is a condition that robs a person of memory, thinking abilities, problem-solving, and other cognitive functions. As it progresses, dementia may interfere with a person's ability to take care of themselves. Alzheimer's disease is the most common type of dementia, but other forms include vascular dementia, Lewy body, frontotemporal, and mixed dementia from more than one cause.

Worldwide, over 10 million new cases of dementia are diagnosed annually—one new case every 3.2 seconds. Over 55 million people worldwide have dementia. Scientists expect this number to nearly double every 20 to 30 years, reaching 78 million in 2030 and 139 million in 2050. The fastest growth in dementia is in the elderly in China, India, and the nearby south Asian and western Pacific countries. [4]

How Brain Cells Talk to Each Other

Brain chemicals known as neurotransmitters are the communication connectivity of your mind. Brain cells use these neurotransmitters to communicate with each other. Some neurotransmitters—known as excitatory—trigger activity in the cells. Other inhibitory neurotransmitters interfere with or reduce a cell's activity. Acetylcholine is one of the excitatory neurotransmitters involved in brain health. It plays an important role in muscle contractions and triggers the secretion of hormones. In Alzheimer's disease, acetylcholine levels are low.

Benefits of Cognias Brain Formula

- Increasing attention and focus
- Promoting calm behavior
- Improving memory and cognition
- Increasing motivation
- Supporting brain health
- IQ Support

Lifestyle Measures and Your Brain

Making healthy choices is important for brain function. One of these choices is the amount you exercise. Aerobic exercise boosts your heart rate and increases blood flow to your brain. As your breathing increases, more oxygen is pumped into your bloodstream and delivered to your brain. The increased oxygen triggers neurogenesis—or the birth of neurons—in certain parts of your brain that control memory and thinking.

Neurogenesis leads to greater brain volume, providing a cognitive reserve believed to help buffer the effects of dementia.

Exercise results in an increase in the neurotransmitters serotonin and norepinephrine in the brain, which speed up information processing and improve mood. The information going from your arms/legs to your brain travels 150-260 miles per hour.

But exercise alone isn't enough. Getting enough sleep is also essential for thinking clearly. Not getting enough shuteye kills brain cells, while proper sleep helps you remember what you've learned. While sleeping, the brain processes all your memories from the day.

Your brain also needs building blocks in the form of proper nourishment in order to thrive.

Nourishment for Brain Health

Your brain needs certain nutrients in order to work its best. Our brain support formula combines the best nutrients to fuel your brain so that you can stay sharp and focused no matter what your age.

B Vitamins that Work for Your Brain

We have included the most bioactive forms of B vitamins in the Cognias Brain Formula due to their science-backed ability to boost brain health. B vitamins work together to promote different aspects of brain function, including energy production and the synthesis of brain

chemicals.[5] B vitamins keep people mentally sharp as they age.[6]

Benfotiamine, a type of thiamine, can support brain health in people with mild cognitive impairment, improve cognition, and support a healthy inflammatory response in the brain.[7]

Likewise, kids with ADHD often have low levels of other B vitamins like vitamins B2 (riboflavin), B6, and B9. Our formula contains the active form of riboflavin, riboflavin-5-phosphate, which means your body can use it right away to support a healthy brain.[8]

Additional B Vitamins that Help to Protect Your Brain

• **Active Folate.** We chose to include the MTHF form of folate in the formula rather than folic acid because many people cannot convert folic acid into the active form of folate the body and brain need.[9] Folate lowers homocysteine, an amino acid linked to dementia.[10]

• **Vitamin B6 in the form of pyridoxal-5-phosphate (P-5-P).** Another component of our brain-boosting formula is the active form of B6. Normally, your liver needs to convert vitamin B6 in order for the body and brain to use it, but P-5-P, the active form, doesn't need to be converted. This is important because some people aren't able to make the conversion due to genetic mutations, side effects of drugs for asthma and seizures, and liver disease, meaning standard vitamin B6 supplements might not work as well for these people.[11]

P-5-P plays a critical role in brain health because it helps the body make brain chemicals like dopamine, serotonin, and norepinephrine, which boosts mood and your ability to think straight.[12] P-5-P also supports nervous system function.[13]

• **Vitamin B12 (Methylcobalamin).** The Cognias Brain Formula includes a special form of vitamin B12 that is better absorbed by your body. As you grow older this is especially important because people 60 years or older often have a hard time absorbing and using vitamin B12. Optimal levels of vitamin B12 keep your brain from shrinking as you grow older, a process scientists call brain atrophy.[14]

Vitamin B12, along with active folate, neutralizes the damaging effects of homocysteine. Scientists have found that older people who have vitamin B12 and folate deficiency combined with high homocysteine levels are more likely to suffer from worsening memory and cognition.[15] Elderly people with depression also are more likely to have low vitamin B12 levels and high homocysteine.[16]

Minerals for Your Brain

Just like B vitamins, certain minerals are as important to staying mentally sharp and focused, so we're including them in our formula. Here are two that are backed by science for their brain-supporting abilities.

Magnesium Threonate

Magnesium is one of the key players in brain health, and it's involved in many aspects of cognitive function, such as controlling neurotransmitters in the brain, helping the nerves to talk with each other, and stopping neurons from becoming overstimulated. But standard magnesium supplements aren't absorbed well by the body, so we've chosen to include magnesium threonate.

This form of magnesium hitches a ride with L-threonate to carry it into the brain. Research shows that this type of magnesium is very good at raising magnesium levels in brains and neurons. One study in healthy Chinese adults ages 18 to 65 years old found that taking magnesium threonate improved all aspects of memory and cognition tested.[17] Although all the age groups showed some improvements, the benefits were most dramatic in the older participants.

Other studies found equally impressive benefits of magnesium threonate. For example:

• One study of adults with age-related memory decline found that supplementing with magnesium threonate for 12 weeks improved specific aspects of memory known as executive function and working memory compared to the placebo group.[18]

• A landmark study published in 2010 looked at how magnesium L-threonate could affect cognition in aging rats. The mineral reversed

the changes in synaptic density that occur due to aging, which in turn improved learning and memory in the animals. Synaptic loss is a red flag of age-related cognitive decline, which indicates magnesium L-threonate can support healthy brain aging.[19]

• Other animal studies showed that magnesium L-threonate reduced dopamine neuron loss and that it could reduce nerve pain.[20,21]

Zinc Picolinate

Zinc picolinate is included in the Cognias Brain Formula because zinc is found in neurons in several brain regions, including the cortex, amygdala, and hippocampus. The brain needs zinc to function at its best, but as we age, the serum level of zinc gradually drops. Zinc deficiency is closely linked to cognitive decline and age-related memory loss.[22]

Boosting the Brain Chemical Acetylcholine

Acetylcholine is a brain chemical involved in memory, learning, and attention. Low levels of this neurotransmitter are linked to Alzheimer's disease. One of the best ways to nourish your brain is to make sure you have optimal acetylcholine levels. Our formula contains nutrients that can nourish your acetylcholine levels or keep your brain healthy in other ways.

Phosphatidylserine (PS)

PS is a nutrient involved in brain function, and the body needs it to maintain healthy nerve cell membranes and the nerve cell sheath, known as myelin.[23] It stimulates cognitive activity. PS crosses the blood-brain barrier, meaning it's available for your brain to enhance memory and keep nerve cells healthy. PS can support:[23]

• The formation of short-term memories
• Maintaining long-term memories
• Creating new memories
• Retrieving memories
• Learning and recalling information
• Focusing attention and concentrating
• Reasoning and solving problems
• Language skills
• Communicating

Alpha GPC

Alpha glycerophosphocholine (Alpha GPC) is a combination of choline and glycerophosphate, which crosses the blood-brain barrier more easily than standard choline supplements where it goes to work to increase acetylcholine and protect the brain.[24]

Alpha GPC sharpens the attention span and makes it easier to concentrate. It oversees important brain chemicals involved in cognitive function. Alpha GPC stimulates the release of dopamine, a brain chemical involved in mood, and boosts both mental and physical energy, which is why Alpha GPC is a favorite of athletes.[25,26]

Promoting natural energy levels may make you more productive and focused. It may also help you stay motivated.[27] If your goal is to learn faster and remember more, Alpha GPC could have you covered.

Marine-Fueled Brain Power

Omega-3 polyunsaturated fatty acids from fish are essential because the body can't flourish without them. About 50% to 60% of brain weight is made up of fat, and 35% of that is omega-3 PUFAs. The omega-3 known as DHA is vital for brain health, and it makes up more than 40% of total omega-3 PUFAs in neuronal tissue, especially in the brain's gray matter.[28] Because it's so crucial to brain health, DHA is often added to baby formulas.

Supplementing with omega-3 fatty acids that include DHA can improve mental performance by increasing blood circulation in the brain.[28] DHA intake may also support memory and learning during brain aging.[29] Omega-3s can support healthy memory in both the young and old.[29,30]

Harnessing the Power of Nature

The Cognias Brain Formula contains several powerful brain-boosting botanicals. These include:

• **Bacopa** – Bacopa is a plant-derived memory enhancer. Research shows that bacopa helps people process visual information faster and learn quicker, as well as help with retaining memories.[31] Bacopa promotes higher levels of the brain chemical acetylcholine, which is involved in memory and attention span. Likewise, Bacopa increases levels of other neurotransmitters in the hippocampus of the brain like serotonin and GABA, which improve mood and have a calming effect.[32] It also helps neurons branch out, which boosts learning and memory.[33] Bacopa enhances age-related cognitive performance in the elderly[34] and helps kids think clearer and sleep better.[35]

• **Ginkgo biloba** – One of the most popular nutrients for brain health, Ginkgo increases circulation to the brain,[36] nourishing it with plenty of oxygen and nutrients. Ginkgo may improve memory and cognitive function during aging.[37] In children with attention-deficit hyperactivity disorder (ADHD), Ginkgo improved attention span, a benefit that both teachers and parents noticed.[38]

• **Huperzine A** – A natural supplement from Chinese club moss (Huperzia serrata), huperzine A can help turbo-charge your brain's cognitive processes. Research in Alzheimer's patients has shown that huperzine A significantly improved cognition and allowed patients to more easily switch between tasks.[39] In 1994, the State Food and Drug Administration of China approved huperzine A for Alzheimer's therapy.

Synergistic Support for the Brain

Two other nutrients round out our brain health supplement: bioperine and caffeine.

Bioperine is an easily absorbed type of piperine, a component of black pepper. Animal studies show that piperine increases brain chemicals like dopamine and serotonin, as well as beta-endorphin. Serotonin and beta-endorphin are involved in cognitive function, especially memory. Piperine also supports a healthy inflammatory response in the brain, protecting brain cells.[40] Piperine also supported cognitive function in a mouse model of Alzheimer's disease.[41]

If you drink coffee, you're familiar with the effects of caffeine. We've added a small amount of it to our brain support supplement because it makes you more alert, reduces tiredness, increases your attention span, and helps you concentrate.[42]

The Bottom Line on Brain Health

The key to staying focused and having a sharp memory is to address all measures of brain health. First, get enough exercise and sleep, avoid memory-robbing conditions like diabetes and high blood pressure, and fuel your brain cells with the nutrients mentioned in this article.

The Cognias Brain Formula makes it easy to nourish your brain with the most comprehensive collection of cognitive-enhancing nutrients available in one formula.

Scientific and Medical References

1. Madhavan A. Brain-Inspired Computing Can Help Us Create Faster, More Energy-Efficient Devices — If We Win the Race. Taking Measure. https://www.nist.gov/blogs/taking-measure/brain-inspired-computing-can-help-us-create-faster-more-energy-efficient. Published 2023. Accessed August 17, 2024.
2. Verghese J, Lipton RB, Katz MJ, et al. Leisure activities and the risk of dementia in the elderly. *N Engl J Med.* 2003;348(25):2508-2516.
3. Hörder H, Johansson L, Guo X, et al. Midlife cardiovascular fitness and dementia: A 44-year longitudinal population study in women. *Neurology.* 2018;90(15):e1298-e1305.
4. Dementia Statistics. Alzheimer's Disease International. https://www.alzint.org/about/dementia-facts-figures/dementia-statistics/. Accessed August 17, 2024.
5. Kennedy DO. B Vitamins and the Brain: Mechanisms, Dose and Efficacy--A Review. *Nutrients.* 2016;8(2):68.
6. Wang Z, Zhu W, Xing Y, Jia J, Tang Y. B vitamins and prevention of cognitive decline and incident dementia: a systematic review and meta-analysis. *Nutr Rev.* 2022;80(4):931-949.
7. Gibson GE, Luchsinger JA, Cirio R, et al. Benfotiamine and Cognitive Decline in Alzheimer's Disease: Results of a Randomized Placebo-Controlled Phase IIa Clinical Trial. *J Alzheimers Dis.* 2020;78(3):989-1010.
8. Landaas ET, Aarsland TI, Ulvik A, Halmøy A, Ueland PM, Haavik J. Vitamin levels in adults with ADHD. *BJPsych Open.* 2016;2(6):377-384.
9. Scaglione F, Panzavolta G. Folate, folic acid and 5-methyltetrahydrofolate are not the same thing. *Xenobiotica.* 2014;44(5):480-488.
10. Tu MC, Chung HW, Hsu YH, Yang JJ, Wu WC. Neurovascular Correlates of Cobalamin, Folate, and Homocysteine in Dementia. *J Alzheimers Dis.* 2023;96(3):1329-1338.
11. Rossouw JE, Labadarios D, Davis M, Williams R. Vitamin B6 and aspartate aminotransferase activity in chronic liver disease. *S Afr Med J.* 1978;53(12):436-438.
12. Brown MJ, Ameer MA, Daley SF, Beier K. Vitamin B6 Deficiency. In: *StatPearls.* Treasure Island (FL) StatPearls Publishing LLC.; 2024.
13. Bartel PR, Ubbink JB, Delport R, Lotz BP, Becker PJ. Vitamin B-6 supplementation and theophylline-related effects in humans. *Am J Clin Nutr.* 1994;60(1):93-99.
14. Vogiatzoglou A, Refsum H, Johnston C, et al. Vitamin B12 status and rate of brain volume loss in community-dwelling elderly. *Neurology.* 2008;71(11):826-832.
15. Blasko I, Hinterberger M, Kemmler G, et al. Conversion from mild cognitive impairment to dementia: influence of folic acid and vitamin B12 use in the VITA cohort. *J Nutr Health Aging.* 2012;16(8):687-694.
16. Gröber U, Kisters K, Schmidt J. Neuroenhancement with vitamin B12-underestimated neurological significance. *Nutrients.* 2013;5(12):5031-5045.
17. Zhang C, Hu Q, Li S, et al. A Magtein(®), Magnesium L-Threonate, -Based Formula Improves Brain Cognitive Functions in Healthy Chinese Adults. *Nutrients.* 2022;14(24).
18. Liu G, Weinger JG, Lu ZL, Xue F, Sadeghpour S. Efficacy and Safety of MMFS-01, a Synapse Density Enhancer, for Treating Cognitive Impairment in Older Adults: A Randomized, Double-Blind, Placebo-Controlled Trial. *J Alzheimers Dis.* 2016;49(4):971-990.
19. Slutsky I, Abumaria N, Wu LJ, et al. Enhancement of learning and memory by elevating brain magnesium. *Neuron.* 2010;65(2):165-177.
20. Shen Y, Dai L, Tian H, et al. Treatment Of Magnesium-L-Threonate Elevates The Magnesium Level In The Cerebrospinal Fluid And Attenuates Motor Deficits And Dopamine Neuron Loss In A Mouse Model Of Parkinson's disease. *Neuropsychiatr Dis Treat.* 2019;15:3143-3153.
21. Mathew AA, Panonnummal R. 'Magnesium'-the master cation-as a drug-possibilities and evidences. *Biometals.* 2021;34(5):955-986.
22. Sun R, Wang J, Feng J, Cao B. Zinc in Cognitive Impairment and Aging. *Biomolecules.* 2022;12(7).
23. Glade MJ, Smith K. Phosphatidylserine and the human brain. *Nutrition.* 2015;31(6):781-786.
24. Marcus L, Soileau J, Judge LW, Bellar D. Evaluation of the effects of two doses of alpha glycerylphosphorylcholine on physical and psychomotor performance. *J Int Soc Sports Nutr.* 2017;14:39.
25. Parnetti L, Amenta F, Gallai V. Choline alphoscerate in cognitive decline and in acute cerebrovascular disease: an analysis

of published clinical data. *Mech Ageing Dev.* 2001;122(16):2041-2055.
26. Bellar D, LeBlanc NR, Campbell B. The effect of 6 days of alpha glycerylphosphorylcholine on isometric strength. *J Int Soc Sports Nutr.* 2015;12:42.
27. Tamura Y, Takata K, Matsubara K, Kataoka Y. Alpha-Glycerylphosphorylcholine Increases Motivation in Healthy Volunteers: A Single-Blind, Randomized, Placebo-Controlled Human Study. *Nutrients.* 2021;13(6).
28. Dighriri IM, Alsubaie AM, Hakami FM, et al. Effects of Omega-3 Polyunsaturated Fatty Acids on Brain Functions: A Systematic Review. *Cureus.* 2022;14(10):e30091.
29. Danthiir V, Hosking DE, Nettelbeck T, et al. An 18-mo randomized, double-blind, placebo-controlled trial of DHA-rich fish oil to prevent age-related cognitive decline in cognitively normal older adults. *Am J Clin Nutr.* 2018;107(5):754-762.
30. Bauer I, Hughes M, Rowsell R, et al. Omega-3 supplementation improves cognition and modifies brain activation in young adults. *Hum Psychopharmacol.* 2014;29(2):133-144.
31. Stough C, Lloyd J, Clarke J, et al. The chronic effects of an extract of Bacopa monniera (Brahmi) on cognitive function in healthy human subjects. *Psychopharmacology (Berl).* 2001;156(4):481-484.
32. Aguiar S, Borowski T. Neuropharmacological review of the nootropic herb Bacopa monnieri. *Rejuvenation Res.* 2013;16(4):313-326.
33. Vollala VR, Upadhya S, Nayak S. Enhancement of basolateral amygdaloid neuronal dendritic arborization following Bacopa monniera extract treatment in adult rats. *Clinics (Sao Paulo).* 2011;66(4):663-671.
34. Calabrese C, Gregory WL, Leo M, Kraemer D, Bone K, Oken B. Effects of a standardized Bacopa monnieri extract on cognitive performance, anxiety, and depression in the elderly: a randomized, double-blind, placebo-controlled trial. *J Altern Complement Med.* 2008;14(6):707-713.
35. Kean JD, Downey LA, Sarris J, Kaufman J, Zangara A, Stough C. Effects of Bacopa monnieri (CDRI 08®) in a population of males exhibiting inattention and hyperactivity aged 6 to 14 years: A randomized, double-blind, placebo-controlled trial. *Phytother Res.* 2022;36(2):996-1012.
36. Xu L, Hu Z, Shen J, McQuillan PM. Effects of Ginkgo biloba extract on cerebral oxygen and glucose metabolism in elderly patients with pre-existing cerebral ischemia. *Complement Ther Med.* 2015;23(2):220-225.
37. Singh SK, Srivastav S, Castellani RJ, Plascencia-Villa G, Perry G. Neuroprotective and Antioxidant Effect of Ginkgo biloba Extract Against AD and Other Neurological Disorders. *Neurotherapeutics.* 2019;16(3):666-674.
38. Shakibaei F, Radmanesh M, Salari E, Mahaki B. Ginkgo biloba in the treatment of attention-deficit/hyperactivity disorder in children and adolescents. A randomized, placebo-controlled, trial. *Complement Ther Clin Pract.* 2015;21(2):61-67.
39. Gul A, Bakht J, Mehmood F. Huperzine-A response to cognitive impairment and task switching deficits in patients with Alzheimer's disease. *J Chin Med Assoc.* 2019;82(1):40-43.
40. Yang W, Chen YH, Liu H, Qu HD. Neuroprotective effects of piperine on the 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine-induced Parkinson's disease mouse model. *Int J Mol Med.* 2015;36(5):1369-1376.
41. Wang C, Cai Z, Wang W, et al. Piperine attenuates cognitive impairment in an experimental mouse model of sporadic Alzheimer's disease. *J Nutr Biochem.* 2019;70:147-155.
42. Kennedy DO, Wightman EL. Mental Performance and Sport: Caffeine and Co-consumed Bioactive Ingredients. *Sports Med.* 2022;52(Suppl 1):69-90.