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Key Inforbits

- What is mild cognitive impairment?
- History of cognitive enhancement
- Modern ingredients
- Common products today



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JOG YOUR MEMORY: OTC COGNITIVE FUNCTION SUPPLEMENTS

What is Mild Cognitive Impairment?^{1,2}

Mild cognitive impairment (MCI) refers to patients who have a degree of cognitive impairment that causes complaints from the patient and/or family members without affecting the patient's ability to function normally. This differs from Alzheimer's disease or dementia, which do impact a patient's ability to function at a normal level or live safely at home and are more severe than MCI. The risk of developing MCI increases with age. Only about 5% of patients ages 65 to 69 have some form of memory impairment, whereas nearly 35% of patients experience memory impairment by ages 85 and older. MCI can be classified as either amnesic or non-amnesic, meaning it affects either memory or cognitive skills other than memory, respectively.

The History of Cognitive Enhancement Supplements³

The idea of preventing cognitive decline is not a new one. In fact, ancient remedies from India and China have been used for memory improvement for about 5,000 years. In Indian culture, Ayurvedic medicine was an approach to natural and holistic medicine that focuses on three aspects of mental health: memory, learning and understanding, and retention. Supplements used in this culture include *Bacopa monnieri*, winter cherry, aloeweed, and pennywort. In traditional Chinese medicine (TCM), various supplements were used for improving memory and cognition as well, including *Ginkgo biloba*, ginseng, goji berries, reishi mushrooms, and danggui-shaoyao-san (DSS).

Modern Ingredients⁴⁻²⁵

Ingredient	Where it's found	Theories on how it works
Apoaequorin	Jellyfish species <i>Aequorea victoria</i>	Binds calcium in neuronal cells to mitigate cell death caused by excess calcium
<i>Coffea arabica</i> fruit extract	Fleshy fruit surrounding coffee beans on coffee plant	Increases brain-derived neurotrophic factor and reduces reactive oxygen species
Phosphatidylserine	Human cell membranes and myelin of brain tissue; egg and soybean	Improves neurotransmission, receptor sensitivity, enzyme function; prevents neuronal cell membrane remodeling
Omega-3-fatty acids	Fish, other marine animals, humans	Patients with cognitive dysfunction potentially have lower levels of omega-3-fatty acids
Vitamin B6 (pyridoxine) Vitamin B9 (folic acid) Vitamin B12 (cyanocobalamin)	Foods such as grains, flour, eggs, vegetables, legumes, and meats	Prevents gray matter atrophy by increasing homocysteine metabolism
Vitamin C	Citrus fruits	Prevents cellular damage from oxidative stress via antioxidant properties
Vitamin D	Made by the skin when exposed to sunlight; milk, eggs, fish	Potential link between low vitamin D levels and poor cognitive function
Vitamin E	Various foods, including oils, nuts, and vegetables	Prevents cellular damage from oxidative stress via antioxidant properties
<i>Ginkgo biloba</i>	Leaf extract of a tree native to Asia, but also found in Europe and the United States	Prevents cellular damage from oxidative stress via antioxidant properties
Medium chain triglycerides (MCTs)	Dairy fat, various oils	Induces ketosis which could improve energy metabolism in the brain; prevents amyloid plaque damage
Citicoline	Human and animal cells	Reduces free radicals in the brain, improves cell membrane stability, stimulates dopamine release
Ginseng	Extract from <i>Panax ginseng</i> plant	Increases hippocampus acetylcholine levels and inhibits acetylcholinesterase in the CNS
Soy	Soybean plant	Up-regulates nerve growth factor and choline acetyltransferase; decreases phosphorylation of protein tau
Resveratrol	Grapes, red wine, some berries, eucalyptus, spruce, and peanuts	Inhibits beta-amyloid buildup and improves connectivity in the hippocampus

Acetyl-L-carnitine	Human liver, kidney, and brain; foods such as red meat and dairy	Decreases oxidative stress and prevents acetylcholine depletion
<i>Bacopa monnieri</i>	Herb from India	Enhances acetylcholine release, inhibits acetylcholinesterase activity, reduces beta-amyloid levels
<i>Rhodiola rosea</i>	Plant found at cold climates in Asia and Europe	Provides antioxidant activity and inhibits monoamine oxidase

Common Products Today²⁶⁻³¹

Today, there are a variety of different OTC cognitive function supplements that use a variety of different combinations of the above ingredients. Branded over the counter products are rated on safety and efficacy from the Natural Medicines Database on a scale named the Natural Medicines Brand Evidence-based Rating (NMBER). These combinations have limited evidence of their use, but some of the most common products can be seen in the chart below.

Product	Image of product	Ingredients	Safety/Efficacy
Prevagen®	 <p>Image available from: https://www.prevagen.com/shop/prevagen-regular-strength/</p>	Apoaequorin	<p>Safety: Prevagen® has been shown to be safe over a period of 90 days, and there have been only non serious ADRs reported in post market surveillance.</p> <p>Efficacy: There is insufficient data to support the efficacy of this product for decreasing age related cognitive decline.</p>

Neuriva (Original)[®]



Image available from <https://www.schiffvitamins.com/>

Supplement Facts		
Serving Size 1 Capsule		
	Amount Per Serving	% Daily Value
Coffee Fruit Extract (Coffea arabica)	100 mg	†
Phosphatidylserine	100 mg	†

†Daily Value not established.

Safety:
Both the Original and Plus products have been shown to be safe.

Efficacy:
The ingredients caffeine and phosphatidylserine have been shown to have possible efficacy in reducing age related cognitive decline, other ingredients have limited data or are likely ineffective.

Neuriva (Plus)[®]

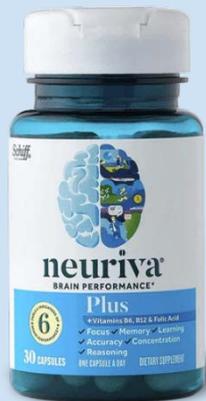


Image available from <https://www.schiffvitamins.com/>

Supplement Facts		
Serving Size 1 Capsule		
	Amount Per Serving	% Daily Value
Vitamin B6 (as pyridoxine hydrochloride)	1.7 mg	100%
Folate (400 mcg folic acid)	680 mcg DFE	170%
Vitamin B12 (as cyanocobalamin)	2.4 mcg	100%
Coffee Fruit Extract (Coffea arabica)	200 mg	†
Phosphatidylserine	100 mg	†

†Daily Value not established.

Irwin Natural[®] Brain Awake[®]



Image available from: <https://irwinnaturals.com/product/brain-awake/>

Supplement Facts		
Serving Size: 3 Liquid Soft-Gels		
Servings per Container: 25		
	Amount per Serving	% Daily Value
Calories	30	
Total Fat	1.5 g	2% ^{**}
Saturated Fat	1.1 g	2% ^{**}
Total Carbohydrates	2.9 g	<1% ^{**}
Protein	2.9 g	
Vitamin B6 (as Pyridoxine Hydrochloride)	10 mg	500%
Folate (200 mcg Folic Acid)	340 mcg DFE	85%
Vitamin B12 (as Methylcobalamin)	500 mcg	20832%
Medium Chain Triglyceride (MCT) Oil	1000 mg	†
Acetyl-L-Carnitine (as Acetyl-L-Carnitine Hydrochloride)	500 mg	†
Bacopa extract (40% bacoposide, 150 mg/whole plant)	375 mg	†
Holy Basil (Tulsi) extract (2% ursolic acid, 4 mg/leaf)	200 mg	†
Apigenin [®] L-Theanine	100 mg	†
InnoVea [®] Caffeine 95% (from Camellia sinensis, 50.96 mg/leaf)	52 mg	†
Lemon Balm extract (10% Eugenol)	30 mg	†
Rosemary extract (2% rosmarinic acid, 0.9 mg/leaf)	30 mg	†
BioPerine [®] Complex (Black Pepper extract (60% piperine) (fruit, Ginger extract (5% gingerols)/licorice)	6 mg	†

^{**}% Daily Value based on a 2,000 calorie diet. †Daily Value not established.

Other ingredients: Glycerin, Rosewood oil, purified water, glycerin, beeswax, soy lecithin, St. John's bread (pancagiolin), malto-dextrin, titanium dioxide (color), silicon dioxide, dicalcium phosphate and menthyl.

Contains: Soy, Tree Nuts (coconut, palm kernel)

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Apigenin[®] is a registered trademark of NutriGen Innovations, LLC.

No preservatives added.

Safety:
There is a lack of safety data for many of the ingredients.

Efficacy:
There is some data supporting the use of Acetyl-L-Carnitine for reducing age related cognitive decline, but the other ingredients included do not have the data supporting their use.

The most well-known out of the three brands is Prevagen® and has a rating of 6 out of 10 (1 being the lowest recommendation, 10 being the highest) on the NMBER scale for safety and efficacy. The evidence behind the use of this product comes from a study conducted by the parent company, Quincy Bioscience, LLC, and was not reviewed by the FDA. Prevagen® recently settled a class action lawsuit for misrepresenting claims that their product helped prevent memory loss.

Also rated as a 6 on the NMBER scale are the Neuriva® products, both original and plus. The Irwin Naturals product has been rated as a 2 on the NMBER scale and cannot be recommended due to the lack of evidence of the ingredients included in the product.



The last “dose” ...

“I am starting to think that maybe memories are like this dessert. I eat it, and it becomes a part of me, whether I remember it later or not.” -Erica Bauermeister, New York Times bestselling author

“Why is it I can remember the lyrics to my favorite song in high school 20 years later, but I can’t remember why I came into the kitchen?” -Someecards®

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