

SOURCE  NATURALS<sup>®</sup>  
Strategies for Wellness<sup>SM</sup>

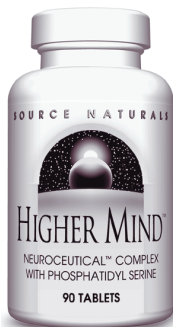
# HIGHER MIND<sup>™</sup>

*Smart nutrients for the  
performance of a lifetime*



*Our adult years are the time to reap the fruit of an active, meaningful life – appreciated by family and friends who value our experience and knowledge. For some, however, their later years are clouded by a mental decline that erodes their capacity to enjoy life. More of us are becoming apprehensive about the future health of our minds. Will we still be able to communicate our needs as well as our wisdom?*

*As science focuses its investigative might on the workings of the human brain, new findings suggest that it is possible to enjoy a vital, healthy brain and mind – well into old age. Based on compelling research, Source Naturals formulated HIGHER MIND. It contains the most important Neuroceuticals<sup>™</sup> now recognized by nutrition scientists – including **phosphatidyl serine**, a natural nutrient that promotes cognitive function.*



*The connection is clear: nourish your brain;  
enrich your life.*

To have a healthy, well-functioning brain and nervous system, we need the correct nutrients. Our diets must provide the necessary raw materials for nerve cells to grow, for the synthesis of neurochemicals, and for the maintenance of nerve cell membranes. Nutritional deficiencies can alter the brain's metabolism, which is expressed by changes in perception and thinking, behavior and mood.

### Brain Cells – Issued at Birth

Before birth, *neurons* (nerve cells) are created at the amazing rate of 15 million per hour. As infants, we have over 100 billion neurons, but this is the most we will ever have because – unlike most other cells in our body – nerve cells do not reproduce. A different strategy is used to replace the neurons that are naturally lost throughout life: nerve cells repair themselves and grow by extending branches of nerve fibers called *dendrites* (from the Latin word for tree). These are the communication links with other neurons that form the circuitry of the brain. A single neuron may be in contact with up to a hundred thousand others! When the density of this fragile organic communication network decreases, we experience a corresponding decline in mental acuity.

### Brain Cell Membranes

The membrane is the working surface of a cell. It needs to be strong yet flexible, so the cell can maintain its integrity and be able to move and change shape. The membrane regulates the flow of nutrients into the cell and the removal of waste, plus controls the passage of molecular messages from outside the cell to its interior. Membrane ion pumps use a third of the cell's energy just to maintain the correct ratio of sodium to potassium.

In neurons, a rapid exchange of sodium and potassium ions across the nerve membrane is responsible for their unique ability to generate the electrical impulses that are the basis of all communication in the nervous system. As cells age, their membranes become less fluid and more rigid. Key membrane molecules called *phospholipids* are crucial to the health of neuron membranes, allowing the brain to maintain its youthful quality. The phospholipids in HIGHER MIND – especially phosphatidyl serine and phosphatidyl choline – are essential nutritional supplements for the aging brain.

### Phosphatidyl Serine – Key to Cognition

For the past decade, researchers have been investigating the role in brain health of a remarkable neurochemical, **phosphatidyl serine** (PS). This key structural molecule is integral to the matrix of fats and proteins that compose cell membranes. Although PS is found in all the cells of the body, its highest concentration is in nerve cell membranes.

PS is rarely found in the foods we eat, so the body has to synthesize it, but the process is energy-intensive and becomes less efficient with age. Consequently, our levels of PS tend to decline as we get older. PS taken as a dietary supplement is well-absorbed, readily reaching the brain, where it helps create more effective, well-structured nerve cell membranes.

The positive effects of PS supplementation have been demonstrated by 23 clinical studies with over 1200 human subjects, ages 43 to 90. Consistent and statistically significant results have confirmed the value of PS in improving age-related cognitive decline, as well as in improving behavioral aspects such as apathy and withdrawal.<sup>1</sup> A major study concluded that for one particular measurable parameter of higher mental functions, PS recipients achieved scores of persons roughly 12 years younger.<sup>2</sup>

*Nerve Growth Factor (NGF)* is one of the most important proteins the body makes. It enables neurons to extend dendrites out to other neurons, allowing the brain to maintain an effective communication network. In experiments, PS enhanced the production and reception of NGF, which tend to drop off radically with age.<sup>3</sup> The effects of PS at the cellular level are manifest in the performance of the brain as a whole. Subjects taking PS showed increased levels of brain energy metabolism. This enhancement corresponded to higher performances on cognitive tests.<sup>4</sup>

### The Chemistry of Thought

Science now understands the role of *neurotransmitters* in regulating the body's complex network of behavior. Neurotransmitters are the chemicals used by neurons to communicate with each other. Activated by a neuron's electrical impulse, neurotransmitters travel between nerve cells, where they excite or inhibit (in various degrees) the electrical impulse in neighboring cells.

One of HIGHER MIND'S key strategies is to improve the brain's ability to produce and use *acetylcholine*, a key excitatory neurotransmitter. Acetylcholine is essential for both the storage and recall of memory, and partly responsible for concentration and focus. It also plays a significant role in muscular coordination. Patients showing cognitive decline may exhibit reduced ability to synthesize and utilize acetylcholine.<sup>5</sup>

The chemical building blocks of acetylcholine and other neurotransmitters are called *precursors*. The most important one for acetylcholine is **DMAE (dimethylaminoethanol)**. This natural substance is found in various fish, such as anchovies and sardines. Supplements of DMAE (and **phosphatidyl choline**) promote increased levels of *choline* in the brain. Acetylcholine is created when an acetyl group is attached to the choline molecule, with the help of *choline acetyl transferase (CAT)*, a key brain enzyme. **Acetyl L-carnitine** is an amino acid that activates this enzyme.

Acetyl L-carnitine may also help reduce *lipofuscin* deposits in the brain because of its involvement in the metabolism of fatty acids.<sup>6</sup> Lipofuscin is composed of oxidized fats and proteins; the brown "age spots" on the back of an elderly person's hand are made of lipofuscin.

The amino acid **L-pyroglutamic acid** sensitizes the acetylcholine receptor sites on a neuron membrane. A given amount of acetylcholine will then have a larger, more powerful effect. Studies have shown that supplements of L-pyroglutamic acid seem to enhance the ability to focus, remember, and learn.

### Total Nutrition for the Brain

The neurotransmitters *dopamine* and *noradrenalin* are critical to motor coordination, motivation, concentration, and alertness. Like acetylcholine, their production tends to decline with age. The precursors and activators of dopamine and noradrenalin included in HIGHER MIND are the amino acids **N-Acetyl L-Tyrosine** and **DL-phenylalanine (DLPA)**, plus **foliac acid, vitamins B-3, B-6, and C**. DLPA is also a precursor to *PEA*, a neuroamine that has a stimulating effect on the brain.

**Glutamine** is an amino acid precursor to *glutamic acid*, a major excitatory neurotransmitter involved in mental activity and learning. Glutamine acts as an alternative fuel source for the brain when blood sugar levels are low. It also helps

the brain dispose of waste ammonia, which is a natural result of protein breakdown but is irritating to neurons even at low levels.

**GABA** is a dietary amino acid which is also an inhibitory neurotransmitter. GABA works to calm and balance the mind, enhancing mental focus. Along with **taurine**, these two relaxing neurotransmitters provide a balancing influence to the other, excitatory neurotransmitters. Taurine is found in brain tissue more than anywhere else in the body. It has antioxidant properties and serves as a nerve cell membrane stabilizer, preventing excessive or erratic electrical activity in the brain.

### The Importance of Magnesium

**Magnesium** must be present in adequate amounts in the synaptic gaps between neurons or the neurons become hyper-reactive: causing noises to sound excessively loud and emotional reactions to be extreme. Magnesium also activates a key enzyme responsible for maintaining cellular sodium-potassium balance, which is absolutely essential to the electrical activity of nerve cells, as well as to the existence of the cell itself. (Cells would burst if the sodium-potassium ratio were wrong.) Magnesium also helps relax cerebral blood vessels and is important to the manufacture of *ATP*, the chief energy molecule of the brain.

A buildup of aluminum has been found in the brains of some elderly. In 1989, the British medical journal *Lancet* published a study showing that drinking water with aluminum can increase the risk of damage by up to 50%. An abundant natural element, aluminum is now a common feature in our culture. It's found in tap water, cookware, deodorants, beverage containers, baked goods, and of course as aluminum foil.

In the brain, aluminum breaks down the structure of neurons – causing them to starve – by displacing magnesium from *tubulin*, a glycoprotein responsible for making *microtubules*. These tiny pipe-like structures within a neuron provide needed rigidity, as well as transport nutrients from the nucleus down the dendrites to the ends of the nerve cell. **Magnesium malate** is an excellent form of magnesium that ensures neurons receive this vital mineral.

### B is for Brain Vitamins

HIGHER MIND also contains a high profile of B vitamins and other key nutrients that are often

lacking in older individuals. A deficiency in any of the B vitamins can alter nerve function and psychological well-being. **Thiamine (B-1)**, known as the “nerve vitamin,” was first recognized because its deficiency caused *beriberi*, a degenerative nerve disease. Thiamine is part of the structure of nerve cell membranes and is important to the reparative process that neurons need to offset the stress of continual firing of the electrical impulse. Low amounts of thiamine can cause cell malnutrition in the hypothalamus, the brain’s memory center.<sup>7</sup>

NAD and NADH, two coenzyme forms of **Niacin (B-3)**, are the most plentiful coenzymes in the brain. They are essential to hundreds of enzymatic reactions, including ones that produce energy. NADH can stimulate the synthesis of key mood-elevating neurotransmitters. It is also one of the body’s most potent antioxidants.

**Pantothenic acid (B-5)**, **cyanocobalamin (B-12)**, and **folic acid** are required to form the *myelin sheath* – the insulating covering of nerve fibers. A diet low in pantothenic acid has been shown to make test subjects emotionally upset, irritable, and depressed.<sup>7</sup> A lack of B-12 can result in poor concentration and, in severe deficiencies, hallucinations. **Pyridoxine (B-6)** is precursor to over 60 enzymatic reactions and is involved in the synthesis of several neurotransmitters.

### Brain Power

Brain cells almost exclusively burn glucose for their energy (other cells can also burn fat), and typically require 50% of all the glucose in the blood. Two B-like vitamins help in the utilization of glucose: **PAK (pyridoxine alpha-ketoglutarate)** may potentiate the effects of insulin and improve glucose utilization to the cells;<sup>8</sup> **Biotin** is important for the transformation of glucose into energy in the brain.

**Lipoic acid** and **coenzyme Q10** are metabolic energizers that help produce *ATP*, the primary energy molecule in the body. Since the brain uses 20% of the body’s total energy supply, efficient *ATP* production is vital. Lipoic acid and CoQ10

are also powerful antioxidants that help regenerate other antioxidants in the body.

The blood vessels feeding the brain become less efficient as we pass middle age. Since the brain depends on the bloodstream to deliver nutrients and oxygen and to remove waste, the quality of this blood flow is paramount to proper brain nutrition. **Ginkgo biloba** leaf extract has been shown in scientific studies to increase blood flow to the brain by helping vessels to dilate. It also promotes the smoothness and healthy integrity of blood vessel linings.

### For the Life of Your Mind

Without proper nutrition, the brain will deteriorate; therefore strategies are needed to both enhance current brain function and protect it throughout life. Based on the latest scientific findings, Source Naturals HIGHER MIND is formulated with neurochemicals that support the mental functions that tend to decline with age. They give your brain the nourishment it needs to integrate perception, memory, and learning into a more comprehensive awareness – so you can excel for a lifetime.

### References

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SOURCE  NATURALS<sup>®</sup>

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