Neurobalance™
Sustained Release

Technical paper & product information

Summary

Neurobalance™ is a blend of magnesium citrate, zinc methionine and vitamin B6, formulated to aid in normal neurotransmitter production and function. This scientifically formulated supplement offers synergistic benefits to optimise the functioning of the nervous system. Utilising a slow-release delivery system, split dosing and the most bioavailable forms of each ingredient, Neurobalance™ ensures optimal blood plasma nutrient levels are maintained throughout the day.

Understanding neurotransmission

Neurotransmitters are chemicals that communicate information throughout the brain and body. Neurotransmitter synthesis is a complex process requiring the action of enzymes that are, in turn, dependent on the presence of specific vitamin and mineral co-factors. In particular, magnesium (Mg), zinc (Zn) and vitamin B6 (B6) are key micronutrients essential to the production of serotonin, dopamine, epinephrine, norepinephrine and gamma-aminobutyric acid (GABA) (Figure 1). Each neurotransmitter is responsible for specific functions (Table below) and a deficiency in one or more co-factors can cause significant impairment in neurotransmitter production and function.

Mg, Zn & B6 not only play a role in neurotransmitter synthesis, but are also required for neurotransmitter function.

Figure 1: The role of Mg, Zn & B6 in the biochemical synthesis of neurotransmitters
Neurotransmission is the process by which neurotransmitters are released by a nerve cell (the presynaptic neuron), into the synapse (the gap between neurones) to then bind to and activate the receptors of another nerve (the postsynaptic neuron), thereby setting off a chain of events that can either be short- or long-term. The physiological effect of the neurotransmitter is dependent not only on the activity of the receptor, but also on ‘transporters’, membrane-spanning proteins that pump neurotransmitters out of the synapse back into the presynaptic cell and on into vesicles for later storage and release. Through this ‘recycling’ activity the transporter protein regulates its own concentration in the synapse, and thus its effects on the receiving neuron’s receptors.

<table>
<thead>
<tr>
<th>Neurotransmitter</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dopamine</td>
<td>Movement, memory, pleasure, reward, behaviour, cognition, attention, inhibition of prolactin production, sleep, mood, learning</td>
</tr>
<tr>
<td>Serotonin</td>
<td>Mood, appetite, sleep, memory, learning, body temperature, pain</td>
</tr>
<tr>
<td>Melatonin</td>
<td>Libido, sleep, immune function</td>
</tr>
<tr>
<td>Norepinephrine</td>
<td>‘Fight or flight’ response, attentiveness, mood, mental arousal, emotions, sleep, dreaming, learning.</td>
</tr>
<tr>
<td>Epinephrine</td>
<td>‘Fight or flight’ response, mental focus, attention</td>
</tr>
<tr>
<td>GABA</td>
<td>Muscle tone, sleep, anxiety modulator</td>
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</tbody>
</table>

**Neurodevelopmental disorders**

A number of childhood disorders are associated with impairments in the growth and development of the brain or central nervous system. Often labelled together under the umbrella term ‘neurodevelopmental disorders’, they include the autistic spectrum disorders (ASD), attention-deficit hyperactivity-disorder (ADHD), dyslexia and dyspraxia. Evidence suggests a breakdown in several neurotransmitter pathways in neurodevelopmental disorders – particularly dopamine, serotonin and GABA. The disruption may be related to differences in receptor subtypes and transporter pathways, [1, 2] imbalances in excitatory to inhibitory receptors (as in the case of GABA), [3] or through genetic variations that can impede normal neurotransmitter function. [4, 5]

**Zinc, magnesium and vitamin B6 in neurodevelopmental disorders**

Zinc is not only required for neurotransmitter synthesis, but also directly interacts with neurotransmitter transporter proteins, thereby playing a direct role in regulating the rate at which neurotransmitters are deposited into the synapse. [6, 7] Low levels of zinc can impede normal neurotransmitter function and deficiencies are common in neurodevelopmental disorders, [8] with zinc supplementation leading to
improvement in symptoms. [9] The deficiencies in vitamin B6 and magnesium that are also common in neurodevelopmental disorders lead not only to low neurotransmitter production but may result in accumulation of the tryptophan metabolite kynurenine, [10] which is itself known to be associated with disturbances in neurotransmission. [11] Vitamin B6 supplementation improves speech and language in some children, though the active form, pyridoxal-5-phosphate (PLP), should be used as children with ASD have poor conversion to the active form. [12] Supplementation with vitamin B6 combined with magnesium avoids issues with vitamin B6 monotherapy and has been shown to improve symptoms relating to ASD and ADHD, [13-15] and more so when used in combination with omega-6 and omega-3 fatty acids. [16]

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Key benefits</th>
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<tbody>
<tr>
<td>Zinc methionine offers superior bioavailability, antioxidant and immune-enhancing properties compared to other forms of zinc.</td>
<td>✓ Cell replication</td>
</tr>
<tr>
<td>Magnesium citrate is more soluble and bioavailable than magnesium oxide found in many cheaper supplements. [15] Magnesium is required for the proper functioning of alkaline phosphatase, the enzyme that facilitates the absorption of vitamin B6.</td>
<td>✓ Energy production</td>
</tr>
<tr>
<td>Pyridoxal-5-phosphate delivers the ‘body-ready’ form of vitamin B6. Vitamin B6 is required for transport or accumulation of magnesium in cells and tissue.</td>
<td>✓ Protein metabolism</td>
</tr>
</tbody>
</table>

Therapeutic application for Neurobalance™

✓ Neurodevelopmental disorders
  o Attention-deficit hyperactivity-disorder (ADHD)
  o Autistic spectrum disorders (ASD)
  o Dyspraxia
  o Dyslexia

✓ Mood disorders
  o Depression
  o Schizophrenia
  o Bipolar syndrome

✓ Neurodegenerative diseases
  o Huntington’s disease
  o Parkinson’s disease
  o Alzheimer’s disease

✓ Women’s health
  o Premenstrual syndrome (PMS)
  o Menopausal symptoms
Product information
Tables per unit: 120
RRP: £12.99
Shelf life from manufacture: 1095 days

<table>
<thead>
<tr>
<th>Commercial</th>
<th>Technical</th>
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<tbody>
<tr>
<td>✓ Highly bioavailable nutrients</td>
<td>✓ Supports neurotransmitter metabolism</td>
</tr>
<tr>
<td>✓ Synergistic relationship between Mg and B6</td>
<td>✓ Supports neurological function</td>
</tr>
<tr>
<td>✓ Easy-to-swallow tablets</td>
<td>✓ Supports hormone balance</td>
</tr>
<tr>
<td>✓ Split-dosing for optimal bioavailability</td>
<td>✓ Supports immune function</td>
</tr>
<tr>
<td>✓ Sustained release tablets for enhanced absorption &amp; optimal tissue distribution</td>
<td>✓ Supports DNA and protein synthesis</td>
</tr>
<tr>
<td>✓ Offers benefits for brain function and mood balance</td>
<td>✓ Aids in the production of sleep modulators</td>
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<tr>
<td></td>
<td>✓ Supports a healthy mood</td>
</tr>
<tr>
<td></td>
<td>✓ Anti-anxiety benefits</td>
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</tbody>
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Nutritional information

<table>
<thead>
<tr>
<th>Serving size: 2 tablets</th>
<th>per serving</th>
<th>% RDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc methionine</td>
<td>14 mg</td>
<td>140%</td>
</tr>
<tr>
<td>Magnesium (elemental)*</td>
<td>60 mg</td>
<td>16%</td>
</tr>
<tr>
<td>Vitamin B6 (pyridoxal-5-phosphate)</td>
<td>10 mg</td>
<td>714%</td>
</tr>
</tbody>
</table>

* (from 376 mg magnesium citrate)

Ingredients
Magnesium citrate; bulking agent: calcium carbonate; emulsifier: microcrystalline cellulose; zinc methionine; vitamin B6 (pyridoxal-5-phosphate); thickener: hydroxypropyl methylcellulose; anti-caking agents: stearic acid, silicon dioxide, magnesium stearate.

Free from:
✓ Dairy ✓ Artificial colourings & flavourings
✓ Gluten ✓ Not tested on animals
✓ Lactose ✓ Non-GMO
✓ Soya

Directions for use
Children aged 4-8 years should take 2 tablets daily. Children aged 9-15 years should take 4 tablets daily. Adults and children aged 16+ should take 6 tablets daily. For optimal results take with food, split into 2 doses per day. Do not exceed the daily dose unless advised by a healthcare practitioner.

Warnings and contraindications
Pregnant or lactating women should consult their doctor before taking any food supplement. This product should not be used as a substitute for a balanced diet. Keep out of the reach of children and away from sunlight. There are no known drug or nutrient interactions associated with Neurobalance™.
References


