

## Building Healthy Brains: Early Nutrition for Cognitive Health

A young child's brain is like a sponge, absorbing, processing, and filing away everything it is exposed to. Brain cells multiply at an incredible rate from before birth through early childhood.

The brain's growth and development early in life sets the foundation for learning and behavior in adolescence and adulthood. Nurturing, supporting, and protecting the brain is crucial from the moment of conception and throughout childhood.

### Prenatal Nutrients for the Developing Brain

The brain forms from the neural tube within three to four weeks after conception. By the 14th week of pregnancy, fetal brain cells increase by about 15 million per hour.<sup>1</sup> By the seventh month, doctors can detect a fetus's brain waves.<sup>1</sup>

Nutrition is vital for the developing brain, and poor maternal nutrition status can have long and short-term effects on fetal brain development and function. Several key nutrients are directly involved in brain development. They include folic acid (folate), choline, vitamin D, and the polyunsaturated fatty acids DHA and EPA.<sup>2</sup>

**Folic acid** is essential for DNA and RNA synthesis, and its needs are increased during pregnancy. Insufficient folic acid intake early in pregnancy is associated with neural tube defects, which are severe or life-threatening birth defects of the brain or spine. As such, pregnant women and those considering pregnancy should take 600 mcg DFE of folic acid daily, and women of childbearing age should get 400 mcg DFE a day.<sup>3</sup>

Folate is naturally present in a wide variety of whole foods. Excellent sources include spinach, legumes, fortified cereals, asparagus, and broccoli. A [prenatal supplement](#) can help ensure that women meet their folic acid needs.

**Choline** is another essential nutrient for fetal brain development. Many foods, like egg yolks, soybeans, chicken breast, beef, and cod, provide choline, but because of the increased need during pregnancy and lactation, many women could benefit from supplementing this nutrient. The recommended daily Adequate Intake (AI) for choline is 450 mg during pregnancy and 550 mg for breastfeeding mothers.<sup>4</sup>

Research suggests inadequate choline during pregnancy can disrupt fetal brain development, leading to lifelong deficits. Findings indicate that supplementing

the breastfeeding mother's or child's diet with choline over the first 1000 days of life can support normal brain development.<sup>2</sup>

It is also worth noting that choline supplementation may have cognitive benefits for children in their school-age years. A study that followed pregnant mothers and their offspring for seven years found that children whose mothers were randomized to take 930 mg of choline (twice the AI) during their last trimester of pregnancy received higher sustained attention task scores at seven years old compared to those whose mothers only achieved the AI intake of 450 mg.<sup>5</sup>

**Vitamin D** is best known for its role in bone health, but there are also vitamin D receptors in the brain. Scientists now recognize that vitamin D also plays an important role in cognitive health throughout the lifespan. Research on vitamin D status during pregnancy and infant neurodevelopment (cognitive, linguistic, and motor skills) measured after an infant's first 40 days shows that deficiency in the mother is associated with worse neurodevelopment in the infant.<sup>2</sup>

Daily vitamin D needs are 600 IU/15 mcg for adults and 400 IU/10 mcg for infants. This vitamin is only present in select foods such as fortified milk, oily fish, and eggs, but it is produced in the skin with sun exposure.<sup>6</sup> Those with limited sun exposure or inadequate dietary intake can [benefit from a supplement](#).

**DHA (docosahexaenoic acid) and EPA (eicosapentaenoic acid)** are omega-3 polyunsaturated fatty acids. The body cannot synthesize adequate amounts of these fats, so they must come from dietary sources, namely cold-water, oily fish such as salmon, mackerel, herring, and sardines, or a fish oil supplement. Omega-3 fats are a central component of brain cell membranes and support brain cell function. They also contribute to normal inflammatory processes in the body and brain. Therefore, these fatty acids play vital roles in brain health throughout life.

DHA is essential during pregnancy because it is a building block of the fetal brain and central nervous system and the main structure of brain tissue.<sup>7</sup> Research studies have shown that omega-3 intake from fish or supplements during pregnancy is associated with improved neurodevelopmental outcomes in children.<sup>7,8</sup> Experts recommend taking a fish oil supplement or prenatal vitamin containing at least [200 mg of DHA](#) during pregnancy and breastfeeding, especially in mothers with low fish intake.<sup>8</sup>

## Nurturing Cognitive Health During Childhood

The human brain grows and matures into early adulthood, but according to the American Academy of Pediatrics, the first few years, and especially a child's first 1,000 days, are critical. By age two, a child's brain undergoes tremendous development in areas that control auditory, visual, and other sensory systems, learning, memory, planning, attention, inhibition, affect, and reward.<sup>9</sup>

A healthy, balanced diet in early childhood provides essential nutrients for proper brain development. Children who are picky eaters or have food restrictions [may need supplementation](#). Ample amounts of these nutrients are necessary for a child's early brain development:<sup>9</sup>

- Protein (milk, yogurt, tofu, legumes, eggs, fish, poultry, or meat)
- Glucose (from legumes, fruits, starchy vegetables, and whole grains)

- Omega-3 and other polyunsaturated fats from fatty fish, nut butter, and seeds
- The minerals zinc, copper, iodine, iron, and selenium from seafood, meat, poultry, nut butter, and legumes
- Vitamins B6, B12, folate, A, K, and choline from fortified cereals, whole grains, fruits, leafy green vegetables, legumes, fish, and eggs.

Omega-3 fatty acids are a key “brain fuel” nutrient for young children, yet many don’t get enough through their diet. Studies on school-aged children have found DHA supplementation can have positive effects on attention, executive functioning (flexible thinking, control, and planning), and processing speed in children and adolescents.<sup>7</sup>

Nutrition experts recommend introducing children to fish and seafood when they start eating other solid foods to get adequate DHA and EPA. Children aged one to three should eat two ounces of low-mercury fish each week. Good choices include salmon, sardines, shrimp, cod, flounder, light tuna, or tilapia.<sup>8</sup> A high-quality [fish oil supplement](#) can also help meet their omega-3 needs.

While childhood nutrition is a pillar of cognitive health, parents and caregivers should also remember that physical activity, quality sleep, mental stimulation, and a nurturing home environment play vital roles, too. These elements work together to promote and maintain a healthy brain and body.

## Feeding the Neurodiverse Mind

Neurodiversity describes differences in the ways people’s brains work and process information. It encompasses conditions such as autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), and dyslexia. Neurodiversity is often identified in early childhood as it can affect how children learn and interact with others.

Children with neurodiverse minds are more likely to be selective eaters or have food sensitivities. Researchers have also reported lower blood levels of certain nutrients, including fatty acids and vitamin D, in these children.<sup>10,11,12</sup> As such, children with neurodiverse minds can often benefit from close attention to their diet with supplementation as needed to support cognitive development.

A balanced diet with ample fruits, vegetables, legumes, whole grains, nuts, seeds, eggs, fish, and other lean proteins can provide essential nutrients. Parents should add a full-spectrum multivitamin and mineral supplement to cover any gaps. It is also wise to consider using an omega-3 supplement. Some research suggests that ASD and ADHD behavioral symptoms are worse with lower levels of omega-3 fatty acids.<sup>12</sup>

Gamma-linolenic acid (GLA) is an omega-6 fatty acid with anti-inflammatory action that can help enhance the effects of omega-3 fatty acids. Over 19 clinical studies using a combination of EPA, DHA, and GLA in a 9:3:1 ratio have shown a positive effect on symptoms for children with ADHD. In a study on children with ADHD, 25% of those who took a combination of EPA, DHA, and GLA had significantly decreased ADHD symptoms after three months. By six months, almost 50% experienced better symptom management on average.<sup>13</sup> A [medical](#)

food with this combination of fatty acids may be helpful for some children. Note that medical foods should be monitored by a health care provider.

Cognitive health is complex, and many factors can affect how the brain works. However, healthy minds start early, and every child's brain requires the right fuel and nutrients from the start. Providing a healthy diet and supplementing as needed from conception through early childhood is one of the best ways to support a child's brain when they are young and into adulthood.

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