DHA, Brain Health, and Reduced Risk of Dementia and Alzheimer's Disease

By Robert Ferguson

Dementia and Alzheimer's disease are becoming more common every year.

According to the Alzheimer's Association, an estimated 7.4 million Americans age 65 and older are living with Alzheimer's dementia in 2026. About 1 in 9 people age 65 and older has Alzheimer's disease, and nearly two-thirds of Americans living with Alzheimer's are women (1).

The number of people affected is expected to keep growing as the population ages. By 2060, the number of Americans age 65 and older with Alzheimer's disease may reach nearly 14 million if better prevention and risk-reduction strategies are not implemented (1).

This is one reason researchers are paying closer attention to nutrition, inflammation, insulin resistance, brain metabolism, and cellular health.

Most people think Alzheimer's disease begins when memory problems begin.

But researchers now believe the disease process may begin 10 to 20 years before symptoms appear.

That means changes involving inflammation, oxidative stress, impaired glucose metabolism, insulin resistance, lipid metabolism, and cellular dysfunction may already be happening quietly in a person's 40s or 50s.

By the time memory loss becomes obvious, the problem may have been developing for years.

One nutrient receiving a great deal of attention in brain health research is DHA.

What Is DHA?

DHA stands for docosahexaenoic acid.

DHA is a long-chain omega-3 fatty acid found in fatty fish like salmon, sardines, anchovies, herring, and mackerel.

It is one of the most important fats in the human brain.

Research shows DHA makes up a large percentage of the fatty acids found in the brain's gray matter, the area involved in memory, learning, emotions, thinking, and behavior (2).

Think of DHA like premium oil in a car engine.

Without good oil, the engine wears down faster.

Without enough DHA, the brain may not function as well as it should.

DHA Above the Neck, EPA Below the Neck

Two of the most important omega-3 fatty acids are DHA and EPA.

Both are important.

Both work together.

But they do not always perform the same primary roles.

In simple language, DHA is especially important “above the neck.”

DHA is strongly connected to:

- brain health
- memory
- focus
- learning
- eye health
- behavior
- cognition
- oral health
- and nervous system health

EPA is often more associated with:

- cardiovascular health
- inflammation balance
- circulation
- joint health
- immune balance
- and whole-body wellness

This does not mean EPA has no brain benefits, because both DHA and EPA support the brain and body.

However, when it comes to the brain’s structure and function, DHA appears to play a particularly important role.

Your Brain Is Built from Fat

For years, people were taught to fear fat.

But the brain needs healthy fats to function properly.

Your brain contains billions of brain cells called neurons. These cells constantly send messages to each other.

DHA helps keep the outer layer of these brain cells healthy and flexible. This outer layer is called the cell membrane.

Healthy cell membranes help brain cells:

- communicate properly
- receive nutrients
- remove waste
- and produce energy

Imagine trying to use a phone with a cracked screen, a weak battery, and a poor signal.

The message may freeze, move slowly, or not go through at all.

That is similar to what may happen when brain cells lose healthy structure and flexibility.

When cell membranes become stiff and unhealthy, communication between brain cells may suffer. Over time, poor communication between brain cells may affect memory, focus, mood, and cognitive performance.

This is one reason cell membrane fluidity matters so much.

DHA May Help Support Memory, Mood, and Behavior

Even though this article focuses on dementia and Alzheimer's disease, DHA and omega-3 fatty acids may affect much more than memory.

Researchers have explored omega-3 fatty acids in randomized placebo-controlled trials and observational studies involving:

- brain fog
- Attention-Deficit/Hyperactivity Disorder (ADHD)
- Autism Spectrum Disorder (ASD)
- depression
- anxiety
- mood balance
- suicidal thoughts and behaviors
- focus
- attention
- and cognitive performance

Some of the leading researchers in this area include Dr. Artemis Simopoulos and Dr. Joseph Hibbeln, along with many other scientists who have helped uncover the important connection between omega-3 fatty acids, inflammation, mental health, behavior, and brain function.

Dr. Joseph Hibbeln, formerly with the National Institutes of Health (NIH), conducted extensive research involving omega-3 fatty acids and their relationship to depression, aggression, behavior, mood disorders, suicide risk, autism-related symptoms, Attention-Deficit/Hyperactivity Disorder (ADHD), and neurological health (3, 4).

Several studies published by Dr. Hibbeln and other researchers found associations between lower omega-3 intake and higher rates of depression, aggression, impulsivity, and suicidal behavior in certain populations (3, 4).

Researchers continue exploring whether improving omega-3 status, especially DHA and EPA levels, may help support healthier brain function, mood regulation, emotional balance, behavior, and cognitive performance throughout life.

It is important to note that omega-3 fatty acids are not being presented as a cure for these conditions.

However, the growing body of evidence suggests omega-3 status may be an important piece of the overall brain health puzzle.

Research also suggests DHA may help increase Brain-Derived Neurotrophic Factor (BDNF) (5).

BDNF acts like fertilizer for the brain.

Just like fertilizer helps plants grow, BDNF helps support brain cell growth, repair, and protection.

Healthy BDNF levels are linked to better brain function and cognitive resilience.

In other words, DHA may help support how the brain functions today and how the brain ages tomorrow.

Brain Inflammation Matters

Another important piece of the puzzle is inflammation.

Inflammation is one of the biggest hidden problems affecting health today.

Short-term inflammation can help the body heal.

But chronic inflammation is different.

It is like a fire that never shuts off.

Over time, that fire may damage tissues, blood vessels, and even the brain.

Research suggests chronic inflammation may play a role in:

- dementia
- Alzheimer's disease
- insulin resistance
- depression
- cardiovascular disease
- and accelerated aging

DHA helps support a healthy balance of inflammation.

It also helps the body produce specialized pro-resolving mediators, including resolvins and neuroprotectins. These compounds help calm inflammation and support healing (6).

This is one reason researchers continue studying omega-3 fatty acids for long-term brain protection.

The Brain Needs Energy

In addition to a healthy balance of inflammation, the brain requires enormous amounts of energy.

Your brain works nonstop.

Even while you sleep, your brain is active.

Some research suggests DHA may help brain cells use glucose more efficiently for fuel (7).

This matters because poor brain energy production is often seen in Alzheimer's disease.

Some researchers even describe Alzheimer's disease as a type of "brain energy crisis."

This helps explain why scientists are paying closer attention to metabolism, insulin resistance, and cellular health when discussing dementia and Alzheimer's disease.

DHA Has a Long Half-Life in the Brain

One fascinating fact about DHA is how long it stays in the brain.

Research suggests DHA has a half-life of approximately 2.5 years in the human brain (7).

A half-life is the amount of time it takes for half of something to disappear or be used up.

Even though DHA can remain in the brain for some time, research suggests that DHA levels and metabolism may decline as people age, especially in individuals carrying the APOE4 gene (7).

The APOE4 gene is one of the strongest known genetic risk factors for Alzheimer's disease.

Interestingly, younger people with the APOE4 gene may show higher brain DHA uptake earlier in life.

However, as people age, DHA utilization and transport may become less efficient.

And for this reason, many researchers believe it may be important to continually replace what the body and brain lose over time through regular intake of fatty fish, omega-3 supplementation, or both.

Think of it like maintaining the oil in a car engine.

You do not wait until the engine breaks down before adding oil.

You maintain healthy levels consistently over time.

The same idea may apply to DHA and brain health.

What Human Studies Show About DHA and Cognitive Function

Several human studies help explain why DHA is getting so much attention.

One randomized, double-blind, placebo-controlled trial gave 900 mg of DHA per day for 24 weeks to healthy older adults with age-related cognitive decline. This study found that DHA improved learning and memory compared with a placebo (8).

This is important because it suggests that DHA may be more effective before major cognitive decline occurs.

Another important study from the Framingham Heart Study found that people with the highest blood levels of DHA had a 47% lower risk of developing all-cause dementia compared with people who had lower DHA levels (9).

A more recent study found that people with higher red blood cell DHA levels had a 49% lower risk of developing Alzheimer's disease compared with those with lower DHA levels (10).

It is important to understand what these studies mean.

These studies do not prove that DHA completely prevents Alzheimer's disease.

They also do not prove that taking a supplement guarantees protection.

However, they strongly support the idea that maintaining healthy DHA and omega-3 status may be associated with lower risk of dementia and Alzheimer's disease.

The key word is status.

Not guessing.

Not hoping.

Knowing.

What About Alzheimer's Treatment Trials?

This is where the conversation must remain honest and balanced.

Some studies using DHA supplementation in people who already had mild to moderate Alzheimer's disease did not show major improvements in slowing cognitive decline (11).

At first, that may sound disappointing.

But it may also teach us something important.

DHA may be more helpful as part of prevention and early support, not as a late-stage rescue treatment after significant brain damage has already occurred.

This is similar to watering a plant.

If the plant is slightly dry, water may help it recover.

But if the plant has been dead for months, water cannot bring it back to life.

The earlier a person supports healthy DHA levels, balanced inflammation, insulin sensitivity, and cell membrane fluidity, the better the opportunity to support long-term brain health.

What About Brain Autopsy Studies?

Postmortem brain studies have reported lower DHA levels in certain brain regions involved in memory and learning in people with Alzheimer's disease, especially in areas like the hippocampus (7, 12).

This does not mean every person with Alzheimer's disease has no DHA in the brain.

But it does support the idea that DHA loss, impaired DHA transport, or poor DHA metabolism may be part of the Alzheimer's disease process.

The hippocampus is one of the brain's key memory centers.

So when DHA levels are lower in this area, it makes biological sense that memory and learning may be affected.

Real Experts Continue to Support Omega-3 Fatty Acids

The idea that omega-3 fatty acids are harmful does not align with decades of scientific evidence.

These are not social media influencers.

These are respected scientists, physicians, and researchers who have spent much of their careers studying nutrition, inflammation, brain health, cardiovascular health, behavior, and chronic disease.

Dr. Artemis Simopoulos is widely recognized as one of the pioneers in omega-3 research. Her work helped establish the importance of the omega-6-to-omega-3 fatty acid balance and how modern diets became heavily overloaded with omega-6 fats compared to what humans historically consumed (13).

Dr. Joseph Hibbeln, formerly with the National Institutes of Health, conducted extensive research on omega-3 fatty acids and their relationship to depression, behavior, mood disorders,

aggression, suicidal behavior, Attention-Deficit/Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD), and neurological health (3, 4).

Dr. Philip C. Calder is one of the most published researchers on omega-3 fatty acids and inflammation. His work has helped explain how omega-3s support immune balance and the resolution of inflammation (6).

Dr. Dariush Mozaffarian, a cardiologist and leading nutrition scientist, has published important research connecting omega-3 intake with cardiovascular and metabolic health outcomes (14).

Dr. William S. Harris helped develop the Omega-3 Index, now considered one of the most important biomarkers for assessing omega-3 status and long-term health risk (15).

Dr. Andrew Weil, a Harvard-trained physician and leader in integrative medicine, has consistently supported omega-3 intake as part of an anti-inflammatory lifestyle.

Dr. Rhonda Patrick has helped educate millions of people on the relationship between omega-3 fatty acids, aging, brain health, cellular health, and longevity, especially the importance of DHA for the brain.

This growing body of research helps explain why omega-3 fatty acids continue to receive attention for brain function, inflammation balance, emotional wellness, and healthy aging.

Fish Consumption and Brain Health

Research consistently shows that people who regularly eat fish often experience better brain health outcomes (9, 16).

Some of the best food sources of DHA include:

- sardines
- wild salmon
- anchovies
- herring
- and mackerel

Sardines are especially popular because they are rich in omega-3s and naturally low in mercury.

For people who enjoy fish, increasing intake of fatty fish may be a practical way to improve omega-3 levels.

However, not everyone likes fish or eats it regularly.

And thankfully, eating fish is not the only way to support healthy DHA levels.

This is important because many people:

- dislike the taste or smell of fish
- follow dietary preferences that limit seafood
- worry about contaminants
- or simply do not eat fish consistently enough to maintain healthy omega-3 levels

This is one reason quality omega-3 supplementation has become so important.

The real objective is maintaining healthy DHA and omega-3 status over time.

That is where testing, proper intake, and consistency become extremely important.

The last thing you want is to faithfully take an omega-3 supplement for months or even years, only to discover that it was not effectively improving your omega-3 levels.

This is one reason testing matters so much.

The goal is not simply to take an omega-3 supplement.

The goal is to ensure your omega-3 levels are improving in a meaningful way.

That is where tools like the BalanceTest become valuable, because they allow people to measure their Omega-3 Index and omega-6-to-omega-3 ratio instead of simply hoping their supplement is working properly.

Why Testing Matters

Many people think they are getting enough omega-3 simply because they occasionally eat fish or take a supplement.

But taking supplements blindly is not the answer.

That is where testing becomes important.

The BalanceTest is an at-home dried blood spot test that measures:

- Omega-3 Index
- omega-6 to omega-3 ratio
- arachidonic acid (AA)
- and fatty acid balance

Research suggests an Omega-3 Index between 8% and 12% is associated with lower long-term health risk (15).

Unfortunately, many people remain far below that level.

Testing allows people to stop guessing and start measuring.

This is important because every person is different.

Some people may need more DHA from fish.

Others may need additional supplementation.

Some may already be doing well.

The key is knowing your levels instead of assuming.

Because when it comes to brain health, prevention and risk reduction are far easier than trying to reverse damage later.

Not All Omega-3 Supplements Are Equal

It is also important to understand that not all omega-3 supplements are equal.

Many omega-3 supplements oxidize easily or fail to improve omega-3 levels effectively.

One reason many people struggle to improve their omega-3 levels is because not all omega-3 products are created equally.

Some omega-3 supplements use lower-quality oils, oxidize easily, or simply do not improve Omega-3 Index levels effectively.

This is one reason I often recommend BalanceOil+.

BalanceOil+ combines omega-3 fatty acids in triglyceride form with olive polyphenols from olives.

Polyphenols help protect delicate omega-3 fats from oxidation while also supporting stability and effectiveness.

Research suggests polyphenols may also help support absorption and protect omega-3 fats from damage.

The goal is not simply taking omega-3s.

The goal is improving cellular health, omega-3 status, and cell membrane fluidity.

Another advantage is that BalanceOil+ comes in several different forms to fit different lifestyles and preferences.

For people who prefer liquid oils, BalanceOil+ is available in flavored oil versions, including options like orange lemon mint.

For people who do not enjoy liquid oils, capsule versions are also available.

And for individuals who follow plant-based or vegan lifestyles, algae-based vegan omega-3 options are available as well.

This is important because not everyone likes fish, liquid oils, or capsules.

The goal is to find a high-quality omega-3 solution that a person can use consistently over the long term, while also verifying through testing that their omega-3 levels are actually improving.

Another important difference is testing.

Many people take omega-3 supplements blindly and never verify whether their levels are actually improving.

With BalanceOil+, people can use the BalanceTest to measure their Omega-3 Index and omega-6-to-omega-3 ratio before and after supplementation.

That matters because the goal is not simply taking an omega-3 supplement.

The goal is to improve omega-3 status in a measurable and meaningful way.

Final Thoughts

You cannot change your genes.

But you can influence your lifestyle, nutrition, inflammation levels, insulin sensitivity, omega-3 status, and the health of your cells.

DHA is not a magic cure.

But healthy DHA levels are essential.

DHA is an important part of the blueprint for optimizing overall health, especially brain health.

Growing evidence suggests maintaining a healthy omega-3 status may help support long-term brain function and reduce risk factors associated with cognitive decline.

The earlier people begin focusing on brain health, the better.

Supporting healthy omega-3 levels, improving insulin sensitivity, reducing inflammation, and optimizing cell membrane fluidity may help support a healthier brain for years to come.

This is not something to put off until tomorrow, next week, or when signs of mental decline begin to appear.

The goal is to be proactive, not reactive. Do not guess. Test. Then act. Then retest.

That is how we move from hope to measurable progress.

If you would like to learn more about the BalanceTest and BalanceOil+, contact the person who shared this article with you.

You may also schedule a free consultation or email me directly at robert@dietfreelife.com.

If you are ready to get started, click "BalanceOil+ with BalanceTest." I personally recommend the orange-lemon-mint flavor.

You can also watch a free 20-minute presentation that explains both the BalanceTest and BalanceOil+ at the following link:

BalanceOil+ with BalanceTest Presentation:
https://www.dietfreelife.com/balanceoil-with-balancetest/

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