BRAINSPAN™
CELL HEALTH ANALYTICS

Healthcare Provider:	Daniel T. Johnston, MD, MPH	**Date of Assessment:**	7/12/17
Office Address:	2671 Avenir Place, Suite 2123 Vienna, VA 22180	**Lab Processing Date:**	7/16/17
		Barcode ID:	SPP-00100
Office Phone Number:	(800) 535-1518	**Patient Name:**	John Doe

Your Nutritional-Cognitive Assessment

Welcome to your BrainSpan results. Below are some very important health metrics from a nutritional and quality of life perspective, based off of your unique test results.

What This Report Measures: This report quantifies specific nutrients called essential fatty acids (EFAs), which play a critical role in protecting and optimizing the health of your brain and body by determining the health of each cell in your body.

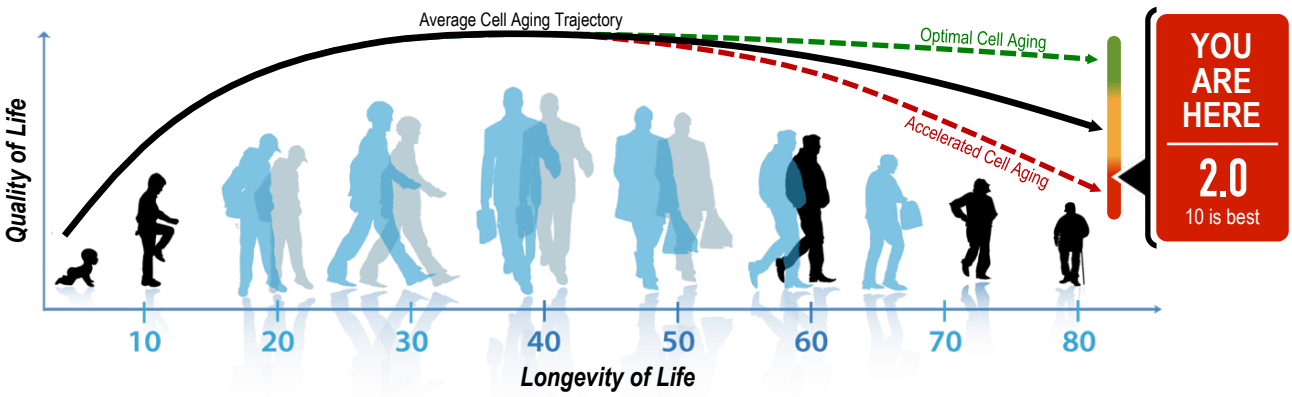
Why It Matters: Your brain is 60% fat, most of which comes from an Omega-3 fatty acid called Docosahexaenoic acid (DHA). DHA promotes new neuron growth, which can occur at all ages, and allows signals to move across neurons. Omega-3 and Omega-6 fatty acids regulate inflammation throughout the body, which is a focal point of virtually every major chronic disease. They also regulate your metabolism, supporting your quality of life and your heart health

The Problem: Most Americans have major fatty acid imbalances driven by dietary, genetic, and cultural factors. It's one of the most significant factors in the steady annual increase of chronic diseases, since these imbalances increase cell aging rates and heighten the risk of many preventable diseases like arthritis, dementia and heart disease. They can also affect your day-to-day quality of life, like your mood, sense of pain, and more. Yet these imbalances largely go undetected, so most people are left in the dark when it comes to the health of their cells and the essential nutrients that determine how cells function, age, and resist stress.

The Good News: With this report, you are now armed with a brain function baseline. Taking the test at regular intervals and tracking your scores can provide you with essential information to make informed decision that can improve your quality of life with simple nutritional and lifestyle interventions. But most of all, it is a powerful way to see how your diet and lifestyle may be impacting your cell function on a bigger scale.

Your Projected Cell Aging Trajectory*

*Your BrainSpan Trajectory Index is the predictive view of your quality of health from your blood cell test and brain function assessment, weighted based on relevant scientific literature regarding age-related cell degeneration and cognitive decline. Research shows that maintaining your scores in the "green zone" lowers your rate of cognitive and functional decline and probably offers resilience against chronic diseases of the brain and body. Note: this model assumes you make no significant lifestyle or nutritional changes.



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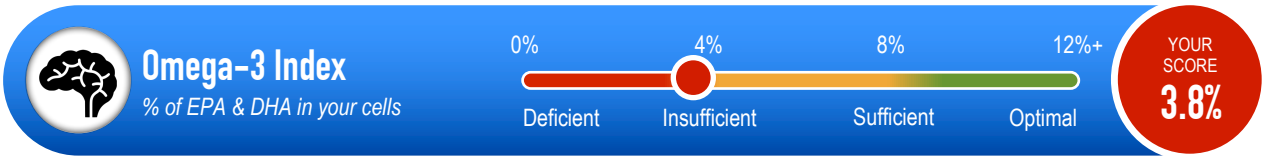

YOUR OMEGA-3 INDEX:

- Omega-3 fatty acids are the building blocks of the brain, determining the brain's integrity and ability to perform. They are to your brain cells what calcium is to your bones -- or what protein is to your muscles.

- These crucial molecules cannot be made by your body, so it is critical to obtain them by eating fish or taking fish oil. The most important factor is how much is absorbed by your blood cells. This is a fact that many scientific studies on fish and fish oil miss leading to confusion about the benefits of fish/fish oil.

- Consistently measuring your Omega-3 Index is the only way to maintain optimal levels. An Omega-3 Index over 8% is associated with improved memory, attention, learning, mood stability, faster recovery from concussions, as well as lower anxiety, depression, and inflammation.

- Tracking your index over time is one of the most important ways to help prevent alzheimer's disease, cognitive decline, and cardiovascular disease.

PERSONALIZED RECOMMENDATIONS:

To achieve an Omega-3 Index above 8% within 3 months, you will need to do one of the following:

Eat a 3 oz. serving of oily fish (Salmon, Herring, Bluefin) at least 2 times per day

or

Take a high quality Omega-3 supplement with 3,000 milligrams of combined EPA & DHA per day

The best source of EPA and DHA are high quality fish oil supplements, specific types of oily fish and/or some newer algal/vegetarian based products. For optimal baseline health across multiple organ systems such heart, brain, immune, GI, and skin, 100+ studies indicate that 8-14% is the target optimal range. Yet the average American has a level of 3.6%. The dose below is only a starting place to add in to your current dietary intake but is just a starting point. Your practitioner may increase for clinical specific conditions. Only through testing then re-testing 70-90 days later can you determine what intake level is right for you to maintain above 8%. Annual monitoring recommended.

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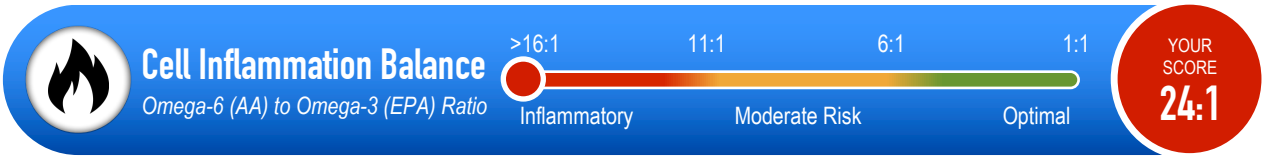


YOUR CELL INFLAMMATION BALANCE:

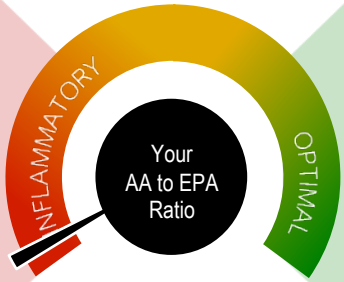
- Due to the way we eat and grow our food, the majority of us in the U.S. have significant deficiencies of important Omega-3 like EPA and DHA (which come from fish) in our diets. This is worsened by having an excess of specific Omega-6s (which come from corn, soy, vegetable oils, and processed foods) in our diets.

- The fatty acids in your cell membrane are a reflection of the average fatty acids in your diet over the last 90 days. However, Omega-6s (specifically one called "AA") tend to increase inflammation and clotting, whereas Omega-3s such as EPA tend to decrease inflammation and increase blood flow. Balancing these fatty acids is foundational to properly regulating your body's inflammatory response.

- Tracking your dietary balance of AA to EPA is a more comprehensive way to understand your dietary needs/modifications , building on and going beyond the Omega-3 Index. A ratio of 5 or less AA to every 1 EPA is essential to properly balancing inflammation, modulating pain receptors, and regulating immune system function.

Research has associated a HIGHER Ratio of Cellular AA to EPA with:

- High Inflammatory Response [12,13,14,15]
- Increased Pain Response [16,17]
- Hormone/Immune Dysfunction [18]
- Higher Risk of Cancer/Disease [21,22,23]



Research has associated a LOWER Ratio of Cellular AA to EPA with:

- Lower Inflammation Levels [12,13,14,15]
- Reduced Chronic Pain [16,17]
- Resilience to Concussion [19,20]
- Lower Risk of Heart Attack [21,22,23]

PERSONALIZED RECOMMENDATIONS:
To Improve your Cell Inflammation Index within 3 months, you will need to do the following:

Nutritional supplements like boswellia serrata and curcumin inhibit Omega-6 inflammatory pathways and help balance inflammation.

Processed foods are high in pro-inflammatory Omega-6s. Reducing these foods will help balance your inflammation ratio.

Grass fed meat is higher in Omega-3s. Grain fed meat is high in Omega-6s. Eating grass fed meat will improve your ratio.

Replace commonly used vegetable oils with healthier alternatives such as olive, macadamia nut, or hi-oleic sunflower oils.

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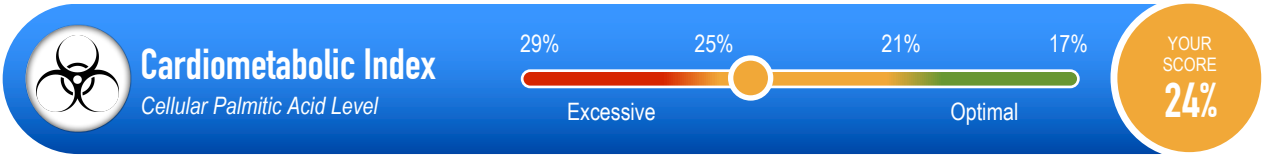


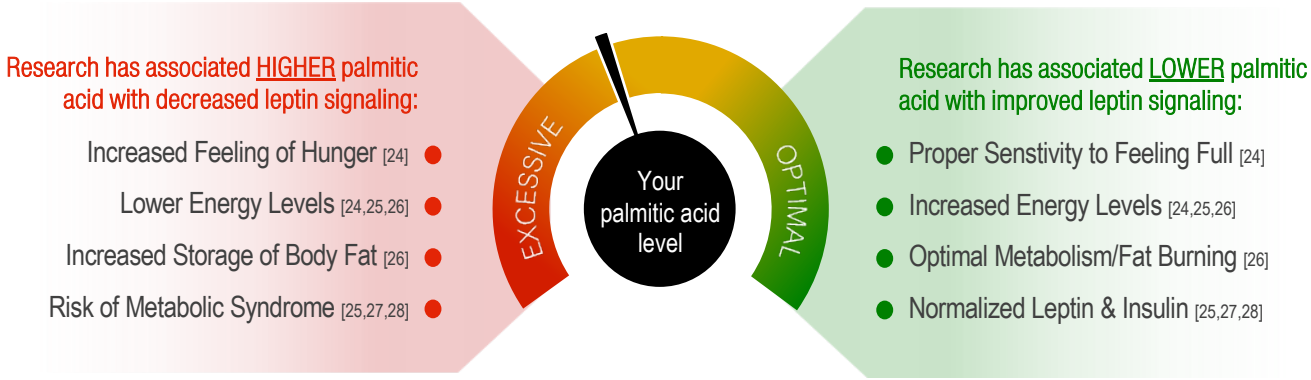
YOUR CARDIOMETABOLIC INDEX

- Excessive palmitic acid (usually from a diet high in simple carbohydrates) is associated with fatty acid alterations within the cell that can suppress hormones that are critical to proper cell-to-cell signaling.

- Maintaining optimal palmitic acid levels helps normalize leptin and insulin signaling, which helps regulate your metabolism, increases your energy, and improves neurotransmitter communication.

- Your brain communicates with your fat cells throughout your body using leptin signaling. Similar to how a thermostat turns the air on and off to keep the temperature stable, leptin communicates to your cells to burn or store fat.

- When proper leptin signaling occurs, the brain properly stimulates a feeling of "full," increases energy, and starts burning body fat. When leptin signaling is suppressed, the brain stays in "hungry" mode, lowering energy output and storing body fat.



PERSONALIZED RECOMMENDATIONS:
To Improve your Cell Toxicity Index within 3 months, you will need to do the following:

Supplements such as coenzyme Q10 & chromium encourage healthy blood sugar by improving carbohydrate metabolism	Reduce your consumption of simple carbs (sugars) so they don't convert to palmitic acid and store up in your cells.	Eat smaller, low glycemic, high protein meals more frequently throughout the day to stabilize your blood sugar production.	Increase exercise so that your body uses more calories and does not convert as much glucose to palmitic acid for storage.

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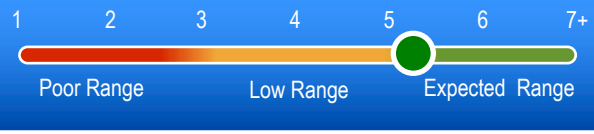
Memory Capacity

Working & Recognition Memory Tests



YOUR SCORE **5.25**

What This Score Means to You

On the memory capacity test, you scored a 5.3 out of 10 based on your age and gender. This is considered to be in the EXPECTED range.

Working memory is the process whereby your brain is able to temporarily store information in the moment and recall it when you need it.

Poor working memory may be associated with nutritional deficits in the cells of the hippocampus – the part of the brain that stores memories.

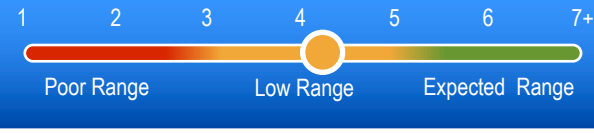
Poor working memory scores may suggest brain cell nutrient deficiencies, inflammation, insufficient neuronal connections, or poor quality sleep.

How to Improve Your Memory Capacity

- ✓ Getting all three of your blood cell biomarkers into the green zone can optimize your working memory.
- ✓ Phosphatidylserine has been shown to enhance memory for words, faces, names, and numbers, and supports brain health across the lifespan.
- ✓ Quality sleep is necessary to consolidate memories so that they can be recalled in the future.
- ✓ Vitamin D – research shows that memory declines up to 300% faster in individuals with low levels of vitamin D. Only use a quality supplement with high cellular absorption.
- ✓ Aerobic exercise has been shown to boost the size of the hippocampus, the brain area involved in memory.
- ✓ Sage is excellent for better brain functioning and boosting memory recall.

Sustained Attention

Sustained Attention Tests



YOUR SCORE **4.25**

What This Score Means to You

On the sustained attention test, you scored a 4.3 out of 10 based on your age and gender. This is considered to be in the LOW range.

To efficiently sustain your attention and 'tune out' competing distractions, your brain must produce specific neurotransmitters. However, your brain requires adequate nutrients to create these neurotransmitters.

Attentional problems may be associated with deficiencies in the pre-frontal region of the brain, which controls selective attention, impulsivity, and motivation. These impairments may be caused from nutrient deficiencies, stress, or inflammation.

How to Improve Your Sustained Attention

- ✓ Getting all three of your blood cell biomarkers into the green zone can optimize your sustained attention.
- ✓ Consume a good amount of protein each day. Proteins contain the amino acids that your brain needs in order to create dopamine and improve attention.
- ✓ Vitamin B6 with Magnesium supports attention by helping your brain cells to produce key neurotransmitters vital to sustaining attention.
- ✓ Sleep quality and quantity is essential to sustained attention.
- ✓ Zinc provides the brain with antioxidant protection and helps produce the sleep hormone melatonin. Zinc has consistently enhanced attention and behavior in clinical trials.
- ✓ Cinnamon has been shown to help attention and it helps regulate blood sugar.

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Cognitive Flexibility

Switching of Attention Test

YOUR SCORE **5**

What This Score Means to You

On the cognitive flexibility test, you scored a 5 out of 10 based on your age and gender. This is considered to be in the EXPECTED range.

Cognitive flexibility is your capacity to rapidly adapt your thinking based on new information and not get stuck in compulsive behavior. Your brain must be able to reorganize itself by forming new neural connections.

Poor cognitive flexibility scores may be due to a decreased production of the neurotransmitters serotonin and GABA.

How to Improve Cognitive Flexibility

- ✓ Getting all three of your blood cell biomarkers into the green zone can optimize your cognitive flexibility.
- ✓ Meditation – research has shown that mindfulness meditation can significantly enhance cognitive flexibility.
- ✓ Probiotics support gut microbiome function and optimize the production of neurotransmitters Serotonin and GABA, which help support cognitive flexibility.
- ✓ 5-HTP is a metabolite naturally made in the brain, is converted to serotonin as needed to promote positive mood, relaxation, and quality sleep.
- ✓ Vitamin B12 with Folate is essential for structural integrity of the brain and spinal cord. They produce neurotransmitters and key enzymes that improve overall cognitive skills.

Processing Speed

Choice Reaction Speed Test

YOUR SCORE **5.5**

What This Score Means to You

On the processing speed test, you scored a 5.5 out of 10 based on your age and gender. This is considered to be in the EXPECTED range.

Processing speed is the pace at which you take in information, make sense of it and begin to respond. It has nothing to do with how smart you are -- just how fast you can take in and use information.

Slow processing speed is associated with inefficient connections in the brain's gray matter. These weak connections may be due to nutrient deficiencies in brain cells, limited production of vital neurotransmitters, chronic stress, lack of quality sleep, and toxins in your diet (such as refined sugars and processed foods).

How to Improve Processing Speed

- ✓ Getting all three of your blood cell biomarkers into the green zone can optimize your processing speed.
- ✓ Curcumin (Turmeric) keeps your brain sharp under pressure. It has also been shown to decrease plaques in the brain linked to Alzheimer's disease.
- ✓ Ginkgo Biloba & Acetyl-L-Carnitine have been shown to enhance cognition in healthy individuals as well as those with age related cognitive impairment.
- ✓ L-Tyrosine can increase the production of neurotransmitters that are essential for the brain's functions such as processing speed, problem solving, and making decisions.
- ✓ A recent study showed that one particular type of brain exercise - called "speed training" can increase processing speed and even significantly reduce the risk of developing dementia.

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Your results below quantify the health of the trillions of cells in your body and the functional performance of your brain. Getting to the "green zone" in each index below and staying there as you age, increases your resilience and optimizes the performance of every organ system in your body, including your brain function. Based on your assessment, your health care provider has provided the below nutritional recommendations to improve your scores and support your optimal cell health. Additionally, you can track your cell health and brain function over time to be sure you are living in the green and aging optimally.

Assessment Summary & Lifestyle/Nutritional Recommendations

Test/Description	Score History	Current Score (7/12/17)	Lifestyle/Nutritional Recommendations
Omega-3 Index *% EPA/DHA in Cell Membrane* - Memory/Focus/Mood - Risk of Dementia/Stroke/CVD - Concussion Resilience		3.8% POOR RANGE	**Oily Fish (Salmon/Herring)** Eat a 3 oz. serving 2 x's/day or **Fish Oil Supplement** 3,000 mg EPA/DHA per day *Ask your doctor to recommend a quality Omega-3 supplement that has demonstrated a high level of cellular absorption. The most important factor is how much EPA and DHA is absorbed into your blood cells.*
Cell Inflammation Balance *Omega-6 to Omega-3 Ratio* - Inflammatory Response - Immune Function - Pain Response		24:1 POOR RANGE	**Replace Vegetable Oils** Substitute whenever possible *Replace Omega-6 vegetable oils with alternatives like olive, macadamia nut, or hi-oleic sunflower oils.* **Curcumin (Turmeric)** Take as directed *Curcumin inhibits specific enzymes involved in the arachidonic acid (Omega-6) inflammatory pathway.**
Cell Toxicity Index *Excess Palmitic Acid Levels* - Energy/Metabolism - Fat Burning Management - Risk of Metabolic Syndrome		24% ABOVE OPTIMAL RANGE	**Protein Meal Replacement** Substitute whenever possible *Replace high carb processed foods with low-glycemic, protein meals to help you feel full.* **Coenzyme Q10 & Chromium** Take as directed *Encourages healthy blood sugar by improving carbohydrate metabolism.**
Memory Capacity On the memory capacity test, you scored a 5.3 out of 10 based on your age and gender. This is considered to be in the EXPECTED range.		5.25 NORMAL RANGE	**Vitamin D (Sunlight)** Take as directed *Research shows that memory declines two to three times faster in individuals with low levels.** **Aerobic Exercise** 20 minutes, 3 x's/week *Aerobic exercise has been shown to boost the size of the hippocampus (the memory area).*
Sustained Attention On the sustained attention test, you scored a 4.3 out of 10 based on your age and gender. This is considered to be in the LOW range.		4.25 BELOW AVG. RANGE	**Magnesium with B6** Take as directed *Supports brain cells in producing vital neurotransmitters needed for sustaining attention.** **Quality Sleep** 7-8 hours/night *Sleep quality and quantity has consistently enhanced attention in clinical trials.*
Cognitive Flexibility On the cognitive flexibility test, you scored a 5 out of 10 based on your age and gender. This is considered to be in the EXPECTED range.		5 NORMAL RANGE	**Probiotics** Take as directed *Supports gut microbiome function which optimizes the production of Serotonin and GABA.** **Mindfulness Meditation** 2-3 x's/week *Research has shown that meditation can significantly enhance cognitive flexibility.*
Processing Speed On the processing speed test, you scored a 5.5 out of 10 based on your age and gender. This is considered to be in the EXPECTED range.		5.5 NORMAL RANGE	**Vitamin B12 with Folate** Take as directed *Essential for structural integrity of the brain and spinal cord as well as improving overall cognitive skills.** **Reaction Speed Games** 2-3 x's/week *A recent study showed that speed training brain games can increase processing speed.*

**This statement has not been evaluated by the FDA. This product is not intended to diagnose, treat, cure, or prevent any disease.*