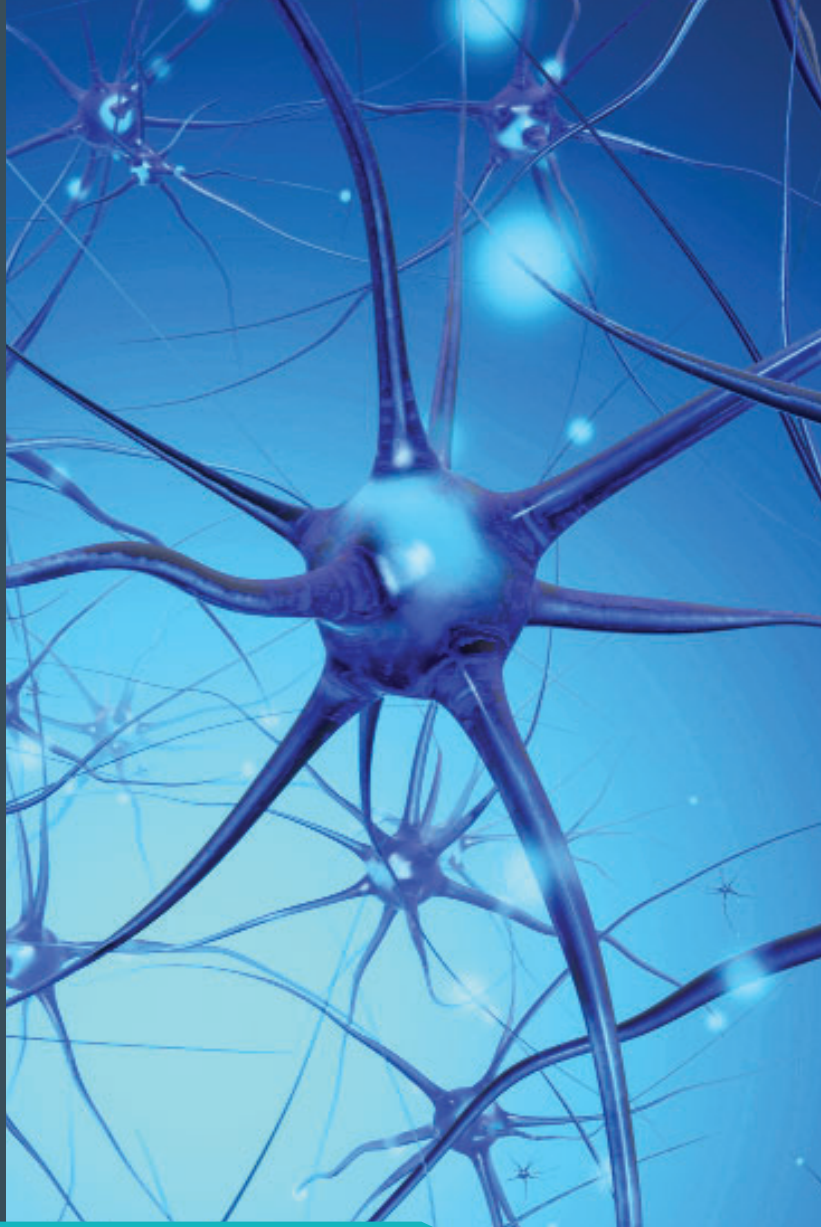
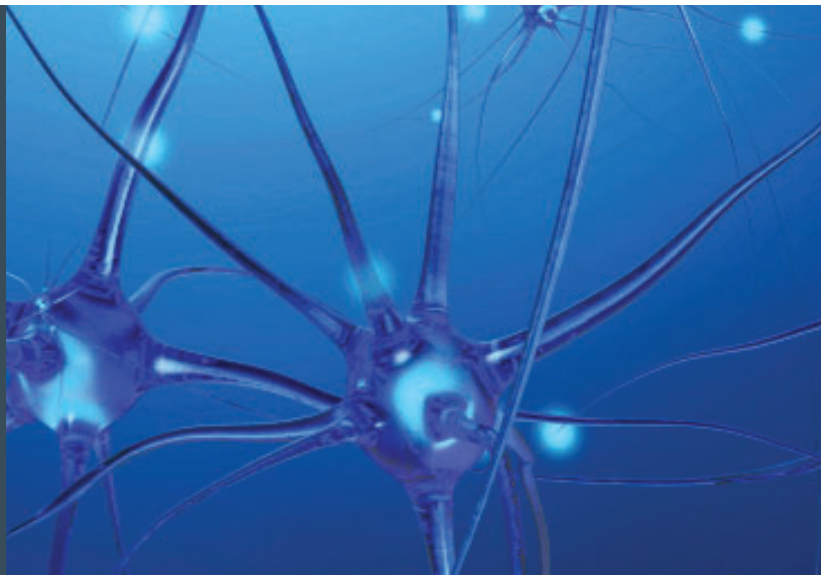
VibrantWellness



Neural Zoomer *Plus*

CONSIDERATION GUIDE



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CONTENT

Vibrant Neural Zoomer Plus is an array of neurological protein antigens. The test measures a patient's antibody response to these antigens related to neurological inflammation and autoimmunity.

Vibrant's Technology

Vibrant Wellness Neural Zoomer Plus has been developed and validated under Vibrant America performace standards which is a CLIA and CAP certified laboratory. The test offers peptide-level antibody detection to all antigens tested. Vibrant Wellness testing is run on a 3D-dense microarray platform which offers highly sensitive, specific, and reproducible results. The test has been validated with a superior coeffiienct of variation and a white paper/validation report is available as a supplemental document.

Antibodies

The Neural Zoomer Plus reports antibodies to neurological and viral antigens The report measures IgG (subclasses 1, 2, 3, 4); IgA (subclasses 1, 2) and IgM antibodies. IgG and IgA antibodies are reported as a combined value while IgM antibodies are reported independently. IgG is a systemic antibody with a long and variable half-life in the blood stream. IgA is found in mucosal membranes (tears, saliva, pulmonary, gut etc) and is used as an acute reaction indicator. IgM is the first immunoglobulin produced by the body with a ½ life of 5-8 days and has more clinical relevance when exploring the central nervous system. In broad summary IgM and IgA would indicate more of an acute reaction vs IgG is indicative of a chronic/historical antibody reaction.

Neurologic Autoimmune Disorders- Diagnostic Challenges and Limitations

The majority of neurologic autoimmune disorders are multisystem disorders with poorly understood etiology that are heterogeneous in their presentation, course, and outcome. They often present at an undifferentiated stage, which may later evolve into an established disease. Many do not have a single clinical, laboratory, pathological, or radiological feature that serves as a 'gold standard' for diagnosis. As such, complex decision-making is required to discriminate between autoimmune and non-autoimmune disorders with similar presentations and shared features. This may include further workup based on factors such as severity of disease, risks of further testing, side effects of treatment and ruling out other conditions in the differential diagnosis (e.g., infections and malignancies). Treatment depends upon the stage of neurologic autoimmunity-initiation vs. propagation vs. relapsing-remitting disease.

Reference Ranges

Reference ranges have been established using a reference population of 192 healthy controls. The determination of the positive cutoff is by 97.5 percentile. If the antibody result is above 97.5 percent; it is considered positive/high risk. If the antibody result is 5% below cutoff (92.5-97.5 percentile) it is considered borderline/-moderate. If the antibody result is less than 92.5 percentile then it is considered negative.

It is helpful to assess the actual numerical result for each antigen, in addition to looking at the summary page of positive/moderate/negative antigens-especially for antigens identified in the "moderate" range. It is recommended to evaluate the significance of values in the moderate range, as to whether they are slightly above the negative range or slightly below the positive/high risk range. As always, these values should be considered along with patient symptoms.

Interpreting the Vibrant Neural Zoomer Plus Report

Patient Assessment: First Step Considerations

- Test and Assess for Intestinal Permeability (Vibrant Wellness Wheat Zoomer)
- Patient Profiling. Neural Zoomer Plus is most appropriate for patients experiencing symptoms such as
  - Ataxia, sensory loss, neuropathic pain, impaired vision, photosensitivity, muscle pain/spasm, muscle weakness/atrophy, orthostatic hypertension, chronic pain/Fibromyalgia, memory loss or brain fog, autoimmune disease, attention deficit or ADHD, and TBI
- What steps has the patient already taken to heal and improve symptoms?
- Evaluate total immunoglobulins to rule out immune-insufficiency which could result in false negative test results. Naturally, immunosuppressive medications can interfere with test results.
- Healing neurological inflammation and disease is complicated. The approach is often analogous to peeling back the layers of an onion.
  - Priority should be action steps to reduce inflammation. Stop throwing gas on the fire!
  - Promote anti-inflammatory practices, diet, supplements and lifestyle principles to reduce oxidative stress
    - Emphasize activities that stimulate cognition such as regular physical activity; brain games; reduction in screen time: and limitation of EMFs
  - Don't underestimate the power of fasting to stimulate the immune system
  - Proper sleep hygiene and stress management is a critical piece to the puzzle

Vibrant's Approach to Neurological Health

Best Dietary Practices:

- There are many considerations and never a one-size fits all approach: General recommendations include: elimination diet; choosing organic meats/vegetables/oils whenever possible; healthy fats; no refined vegetables oils; limit/eliminate added sugars, promote a diversity of color and fiber
- Evaluate for intestinal permeability/heal the gut
- Evaluate micronutrient deficiencies. Consider micronutrient testing through Vibrant America
- Assess and support the microbiome. Dietary approaches to increase microbial diversity such as prebiotic fibers, fermented foods, and polyphenols
- Clean/filtered water
- Good quality fish; wild caught; high in EPA/DHA; and low in mercury
- Promote dietary phytochemicals and phytonutrients. Phytochemical-derived antioxidants have neuroprotective and neuro-regenerative roles, by reducing or reversing cellular damage, slowing progression of neuronal cell loss, and preventing apoptosis. Most notable phytochemicals include polyphenols, quinones, flavonoids, catechins, coumarins, and terpenoids.

General Considerations for Anti-Inflammatory Oxidative Stress Support and Detoxification

- Liberal inclusion of healthy dietary fats that are not processed or oxidized
- Minimize BPAs from plastics
- Reduce pesticide load by choosing organics
- Lifestyle detoxification practices (Sweating; Hydration-consume half your weight in ounces of pure water daily; Epsom salt baths)

Further Testing Considerations

- Address and reset Intestinal Permeability (Leaky Gut)
- Gluten sensitivity/gluten autoimmunity that can influence ataxias. If the Neural Zoomer Plus shows any antibodies against myelin, it is imperative to test antibodies against gliadin
- Food sensitivity/food allergy testing that can help individualize and optimize an elimination diet
- Evaluate micronutrients as deficiencies in vitamins and minerals may certainly be implicated in reduction of cognitive performance, fatigue, neurotransmitter synthesis, and increased oxidative stress/inflammation or impaired ability to detox.
- Test for and assess any possible infection or toxicology driving inflammation including viruses (included in NZ Plus), tickborne diseases, mold/mycotoxins, heavy metals, or other environmental chemicals
- Rule out gut pathogens; evaluate microbiome diversity (Vibrant Gut Zoomer Complete)
- Monitor blood glucose and insulin levels to screen for prediabetes/insulin resistance
- Monitor thyroid and hormone levels; correct imbalances
- Evaluate potential for molecular mimicry with central nervous system aquaporins and elevated antibodies with plant-based aquaporins and the presence of blood brain barrier permeability (Vibrant Wellness Lectin/Aquaporin Zoomer).
- Evaluate potential for molecular mimicry with milk butryphilin (Vibrant Wellness Dairy Zoomer)
- Evaluate any pharmaceuticals that may be neurotoxic
- Evaluate viral load and consider anti-viral protocols if appropriate.

Clinical Associations and possible considerations, interventions, and next steps

Demyelination Antigens

General Considerations:

Myelin is a fatty white substance that surrounds the axons of nerve cells, forming an electrically insulating layer. It is essential for the proper functioning of the nervous system, much like the plastic coating over an electrical wire.

Myelin has molecular mimicry with gliadin. If positive for any demyelination antigens, check antibodies against gliadin (Vibrant Wheat Zoomer). Myelin repair protocols may be warranted if there are any positive antibodies in this section (See protocols).

	Antigen Description and Positive Antibody Associations	Additional Considerations
Anti-Tubulin	Tubulin is a building block protein or 'scaffolding' inside every cell, but highly concentrated in brain cells. Antibodies attack the structure of tubulin and disrupt signal transduction across neurons. Positive antibodies are associated with: • chemical exposure including mercury and other heavy metals. • 56% of Hashimoto's Thyroiditis patients have increased Anti-Tubulin. A complete thyroid panel for any of these patients, including T3 is imperative. • 41% of Graves' Disease patients have increased Anti-Tubulin	• Anti-strep titer with PANDAs • Monitor thyroid levels, particularly T3
Anti-Myelin Basic Protein	Myelin basic protein plays an important role in myelination of nerves. Antibodies against myelin can cause them to short circuit. Elevated Antibodies are associated with: • Disruption of myelin sheath. • Most common in MS, Lupus, Autism, OCD. A candidate antigen in MS. • Correlation exists between increased levels of BPA (Bisphenol A found in plastics) and Anti-Myelin basic protein	• Evaluate Vitamin B6 deficiency as B6 is essential for myelin (P5P is the preferred form) • Check for positive antibodies to plant-aquaporins that have molecular mimicry with AQ4 in central nervous system (Vibrant Lectin/Aquaporin Zoomer)
Anti-Myelin Oligodendrocyte Glycoprotein (Anti-MOG)	Anti-MOG is a candidate autoantigen in MS, particularly in the pediatric population and/or when anti-myelin-basic protein is negative Cross reactivity has been observed between anti-myelin oligodendrocyte glycoprotein (MOG) and Milk Butyrophilin	Vibrant Wellness Dairy Zoomer to evaluate cross reactivity with milk Butyrophilin
Anti-Myelin Associated Glycoprotein (Anti-MAG)	MAG is a transmembrane protein of both the peripheral nervous system (PNS) and central nervous system (CNS). It is involved in the process of myelination and antibodies are associated with peripheral neuropathies. MAG antibodies are also a more specific marker for delineating MS than myelin basic protein	
Anti-Neurofascin	Positive antibodies are associated with • Inflammation and inflammatory conditions (strong association) • Combined central and peripheral demyelination	
Anti-Myelin Proteolipid Protein	Proteolipid protein (PLP) is the major myelin protein of the CNS and plays an important role in the formation and maintenance of myelin.	

Blood Brain Barrier Disruption Antigens

General Considerations:

Any elevated antibodies in the section below can indicate a breach in the blood brain barrier. With any consideration of "leaky brain" it is important to evaluate intake/history for past incidence of concussion or head trauma.

Always evaluate intestinal permeability to bridge the connection between leaky gut and leaky brain.

Advise caution with chelation therapy. Extracted metals may be shunted toward the brain (most metabolically active tissue) If BBB permeability is present, the brain can be subjected to metal exposure.

	Antigen Description and Positive Antibody Associations	Additional Considerations
Anti-s100B	s100B is an astrocytic, calcium binding protein that is a primary component of the blood brain barrier. Anti-s100B indicate BBB permeability and CNS injury. Antibodies develop early-before the development of gross changes, making it a target antibody for prevention. Anti-s100B have primary associations with concussions and TBI. Anti-s100B have associations with AD, especially in conjunction with the ApoE4 genotype Early literature shows Anti-s100B serum levels are elevated before seizures suggesting that BBB leakage may be an early event in seizure development.	• Measure/monitor transglutaminase 2 (TtG2) antibodies as TtG2 is also • found in BBB Measure/monitor LPS antibodies associated with intestinal permeability and blood brain barrier permeability. Recommend diet and lifestyle practices to support and repair leaky gut/intestinal permeability
Anti-Glial Fibrillary Acidic Protein	Anti-GFAP are not found outside the CNS. If antibodies are present in serum; this is considered a blood-based diagnostic marker of brain injury.	
Anti-Microglia	Anti-Microglia indicate a breach of the blood brain barrier and found to play a role in tissue destruction in AD.	
Anti-Glucose Regulated Protein 78	These antibodies can trigger blood brain barrier breakdown and development of anti-aquaporin 4 antibodies, so these antibodies can be used as treatment targets in blood brain barrier treatment protocols.	Consider Vibrant Lectin/Aquaporin Zoomer to check for aquaporin antibodies

Optical and Autonomic Nervous System Disorder Antigens

General Considerations:

Consider Vibrant Lectin Zoomer to check for Aquaporins. Anti-Aquaporin 4 antibodies have been shown to have cross-reactivity with corn and soybean aquaporins.

Evaluate for related antibodies such as anti-cerebellum, demyelinating antigens and peripheral neuropathies. Take action steps to put out the fire and reduce inflammation.

	Antigen Description and Positive Antibody Associations	Additional Considerations
Anti-Neuron Specific Enolase	Neuron-specific enolase is an enzyme found in mature neurons. It is a glycolytic enzyme and is involved in energy (ATP) production for the eye. Antibodies are associated with: • Optical Neuropathies • Traumatic brain injury (TBI)	
Anti-Aquaporin 4	Has been observed in patients with peripheral demyelination. Human aquaporin 4 shows cross reactivity with corn and soybean aquaporins.	
Anti-CV2	Demyelinating peripheral neuropathy	Cross check with TTG6 on Vibrant WZ
Anti-Recoverin	Associated with Retinopathy	

Peripheral Neuropathy Antigens

General Considerations:

Consider Vibrant Wheat Zoomer to cross reference with TTG6 and gluten related triggers for peripheral neuropathies and gluten ataxia.

Because prolonged elevation of anti-GM1 and anti-GM2 may lead to demyelination, check demyelination antigens for further steps of action.

	Antigen Description and Positive Antibody Associations	Additional Considerations
Anti-GM1 **Anti-GM2**	Gangliosides are found in membrane components of the nervous system on the surface of motor and peripheral neurons. They are involved in cell signaling (communication) between neurons. Lysoganglioside GM1 is concentrated in the central nervous system and associated membranes of nerve cells. Antibodies elevated in autoimmune motor neuropathies-primary symptoms are muscle pain/weakness/atrophy and loss of motor function Prolonged elevation of antibodies can lead to demyelination Antibodies can be mildly elevated with other autoimmune conditions: SLE, RA	• r/o C. jejuni as infectious agent-molecular mimicry mechanism • Test for celiac antibodies as celiac can be possible etiology. A very high incidence in patients with celiac • (22%)have peripheral neuropathies. Monitor blood sugar/HbA1c for the control of diabetic neuropathies • In GBS, anti-GMZ antibodies have been detected in up to 67% of CMV infected patients
Anti-Hu	Associated with Sensory neuropathy	
Anti-Ri	Associated with Opsoclonus/Myoclonus	
Anti-Amphiphysin	Associated with Stiff-person syndrome (SPS)	

Neuromuscular Disorder Antigens

General Considerations:

Reduce toxic burden by reducing exposure to BPA in plastics and EMFs from cell phones and WIFI. Use protective devices that reduce radiation.

	Antigen Description and Positive Antibody Associations	Additional Considerations
Anti-Acetylcholine Receptors	Acetylcholine receptors bind acetylcholine which is an important neurotransmitter for signal transduction in the CNS. Receptors are localized in the neuromuscular junctions. This is the primary blood test for Myasthenia Gravis. Positive antibodies are found in up to 90% of people with generalized MG and 50% of those with ocular MG	
Anti-Muscle Specific Kinase	Positive antibodies are found in 50-70% of persons who are negative for anti-acetylcholine receptors yet have generalized MG	
Anti-Titin	Connectin Protein Present in 70-90% of thymoma autoimmune MG patients. Correlates with disease severity	
Anti-Voltage Gated Potassium Channel	Associated with Stiff Man Syndrome	
Anti-Voltage Gated Calcium Channels	Responsible for Lambert-Eaton Myasthenic Syndrome, a rare AI disorder of the neuromuscular junction	

Brain Autoimmunity Antigens

General Considerations:

Check Vibrant Wheat Zoomer and consider a gluten/grain free diet to limit possibility of gluten ataxia.

Monitor for glycemic control.

Check for active viruses and treat according to anti-viral protocols (See protocols).

	Antigen Description and Positive Antibody Associations	Additional Considerations
Anti-Cerebellum	Cerebellum is the portion of the brain that controls motor coordination Antibodies to cerebellum can include antibodies to Purkinje cells, as well as other cerebellar cells and are associated with: • Cerebellar ataxia/gait abnormalities • Statin-induced CoQ10 deficiency • Autism Data suggests molecular mimicry with alpha-gliadin and milk Butyrophilin. This cross reactivity may induce neuro-autoimmunity especially in the presence of CNS inflammation and BBB disruption.	Consider Vibrant Wellness Wheat Zoomer and Dairy Zoomer to identify antibodies to gliadin and/or milk butyrophilin
Anti-Purkinje	Purkinje cells are located inside the cerebellum and are a class of GABA producing neurons. GABA is one of the main inhibitor neurons in the CNS Antibodies to the Purkinje cells of the cerebellum can cause alterations to gait, peripheral movement, ataxia (loss of control of movement of one or more limbs). Antibodies are associated with • Cerebellar ataxia/gait abnormalities • Statin-induced CoQ10 deficiency • Autism	• Consider Vibrant Wellness Wheat Zoomer to identify antibodies to gliadin • Evaluate intestinal permeability and gut microbiome dysbiosis • Evaluate for other infectious diseases (EBV, Toxoplasmosis, and Lyme)
Anti-Amyloid Beta 25-35	One of 2 most common autoantibodies found in Alzheimer's Disease patients	
Anti-RAGE Peptide	Receptor for advanced glycation end products. Has been identified as the major receptor at the blood brain barrier to mediate the flux of amyloid-B protein from the blood to the brain. As it is a glycation end product, strongly correlated with dysregulation of insulin/insulin resistance and hyperglycemia, there is associated risk with DM. One of 2 most common autoantibodies found in Alzheimer's Disease and potentially a therapeutic target for AD. Antibodies are significantly higher with Alzheimer's disease patients with diabetes.	Monitor blood sugar/glycemic control; leptin and insulin levels. Consider testing adiponectin as a marker of inflammation and therapeutic target.
Anti-Glutamate	Glutamate is an excitatory neurotransmitter which converts to GABA by GAD-65 enzyme. Antibodies associated with excitation abnormalities. Glutamate docks on the NMDA receptor and stimulates genetic replication of the NMDA receptor	Evaluate next to GABA antibodies; NMDA antibodies
Anti-Dopamine	Crucial neurotransmitter in the brain. Dopaminergic dysfunction is thought to underlie diseases such as Parkinson's, Tourette's and schizophrenia.	

Anti-α1 and β2 Adrenergic Receptors	Antibodies found mainly in patients with different dementia forms.	
Anti-Yo	Found in serum of patients with neurologic Paraneoplastic cerebellar degeneration (PCD)	
Anti-Amyloid beta (1-42)	Amyloid beta is one of the signature markers in AD	
Anti-Tau	Increased in AD and MS	
Anti-Alpha-synuclein	Mainly elevated in PD and AD	
Anti-Endothelin A receptor	Found in vascular dementia	
Anti-Hydroxytryptamine	Found mainly in autoimmune encephalitis	

Brain Inflammation Antigens

General Considerations:

Note that many of the antigens in this section are receptor antigens. When antibodies to a receptor are present-the actions of the receptor will likely be impaired and may be upregulated OR downregulated (variable response).

Brain inflammation is most usually associated with excitatory symptoms and behaviors.

Best practice is to evaluate underlying cause of brain inflammation. Usually head trauma, infections, gut inflammation/permeability, or food sensitivities will start the inflammatory cascade.

Consider further testing for infection (viral infection, gut Infection, tickborne disease infections, mycotoxin infection)

	Antigen Description and Positive Antibody Associations	Additional Considerations
Anti-Dopamine Receptors-1	Dopamine receptor 1 activates dopamine and facilitates dopaminergic action and is highly concentrated on post-synaptic neurons in the brain Proper functioning of dopamine receptors is responsible for many neurological processes such as fine motor control, cognition, and behavior	
Anti-Dopamine Receptors-2	Dopamine receptor 2 inhibits dopamine and dopaminergic action and is highly concentrated on pre and post-synaptic neurons. Proper functioning of dopamine receptors is responsible for many neurological processes such as fine motor control, cognition, and behavior	
Anti-NMDA	Antibodies to NMDA receptor are major contributors in SLE and have cross-reactivity/molecular mimicry with anti-ds-DNA antibodies. Anti-NMDA receptor encephalitis is a rare autoimmune condition where the antibodies cause the brain to swell. Persons with AD who have NMDA antibodies may be less responsive to traditional AD medications. Positive antibodies may have involvement with seizure disorders and migraine symptoms	Evaluate with Glutamate, GABA, AMPA receptor antibodies Consider Vibrant CTD testing for comprehensive assessment Magnesium Threonate may be therapeutic for anyone with NMDA antibodies
Anti-GABA	GABA is an important neurotransmitter associated with "breaking" of the central nervous system. It has antagonist effects with glutamate as glutamate converts to GABA GABA antibodies will block the function of GABA and the CNS can become excitotoxic (glutamate will build up) • Clinical symptoms typically include anxiety, insomnia, hyperactivity. • Antibodies correlated with Parkinson's	Evaluate with glutamate, NMDA and AMPA antibodies Consider testing for anti-GAD 65 antibodies. GAD 65 is the enzyme that converts glutamate to GABA. Advise caution with using supplemental GABA Phenibut supplement may be therapeutic for anti-GABA antibodies Magnesium Threonate may be therapeutic for anyone with NMDA antibodies
Anti-AMPA	AMPA receptors work in conjunction with NMDA receptors Specific agonist for AMPA receptor and mimics the effects of glutamate.	
Anti-CNTNAP2	Associated with Autism	

Anti-Glycine Receptor	May be helpful in the diagnosis of patients with symptoms and signs that include ocular, motor and other brainstem dysfunction, stiffness, rigidity, myoclonus and spasms	
Anti-Ma	Exclusively found in neurons and testicular germ cells. Found in a wide range of neurological syndromes including encephalitis	
Anti-Neurexin 3 Anti-Leucine-rich Glioma-inactivated protein 1	These markers are all associated with encephalitis	

Infection Antigens

General Considerations:

Viral Infections can dramatically affect the brain and neurological health. Currently, theories of neurodegenerative disorders suggest that amyloid-β plaques in Alzheimer's Disease may be a protective mechanism for the brain against viral infections.

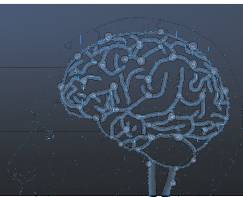
Evaluate the type of antibody against a viral antigen. IgG antibodies are long term and may subsist indefinitely after exposure to a viral load; whereas IgM antibodies indicate primary infection or reactivation of the virus. Viral antibodies always need to be evaluated next to and in context with a patient's clinical symptoms.

Consider subsequent testing of Apo E genotype.

With any viral infection follow up lab assessment should include lymphocyte testing

Anti-viral protocol may be warranted. (See protocols)

	Antigen Description and Positive Antibody Associations	Additional Considerations
Anti-HSV-1	Herpes simplex virus 1 Contagious neurotropic and neuro-invasive virus. Hides from immune system in the cells bodies of neurons. Anti-HSV-1 antibodies have been correlated with increased risk of AD	Evaluate to determine if virus is manifesting clinically (ie cold sores)
Anti-HSV-2	Herpes simplex virus 2 Commonly associated with Herpes simplex encephalitis	Evaluate clinical symptoms (ie genital outbreaks)
Anti-EBV	Epstein Barr Virus (Mono) Active infection is a known risk factor for MS d/t molecular mimicry with EBV and myelin-basic protein	
Anti-HHV-6	Roseola infantum, otitis media with fever	
Anti-HHV-7	Roseola infantum	
Anti-CMV	Cytomegalovirus Frequently associated with GBS	
Anti-Streptococcal A	Bacteric that triggers autoimmune mechanism associated with PANDAS	



Protocols:

Anti-viral Herbs:

What Are Antiviral Herbs?

Antiviral herbs inhibit the development of viruses. They can be used to treat infections without caution because they're harmless and typically cause no or few side effects. Many antiviral herbs boost the immune system, which allows the body to attack viral pathogens. This can be even better than attacking specific pathogens, which antiviral drugs are designed to do, because pathogens mutate over time and become less susceptible to treatment.

Not only do antiviral herbs fight viral infections, they also boost the immune system, and support cardiovascular, and digestive health and have anti-inflammatory properties.

Top 10 Antiviral Herbs	
	***Elderberry*** Fights infections including influenza, herpes, viral infections and bacterial infections. Most every part of the elderberry can be used — the flowers, bark, roots and leaves
	***Echinacea*** There is considerable evidence suggesting that phytochemicals in echinacea have the capacity to reduce viral infections and tumors. This powerful herb contains a compound called echinacein that inhibits bacteria and viruses from penetrating healthy cells.
	***Calendula*** This antiviral herb has high amounts of flavonoids, which are plant-based antioxidants that protect cells from being damaged by free radicals.
	***Garlic*** Experiments have shown that specific chemical compounds found in garlic are highly effective at killing countless microorganisms responsible for some of the most common and rarest infections, including tuberculosis, pneumonia, thrush and herpes.
	***Astragalus Root*** Astragalus root, another powerful antiviral herb used is to boost the body's immune system. A 2004 study evaluated the effects of astragalus on herpes simplex virus type 1 and found that the herb has obvious inhibiting efficacy.
	***Cat's Claw*** Cat's claw has antiviral properties and is used to treat the herpes virus. Early studies are researching its effects on HIV
	***Ginger*** Ayurvedic medicine has praised ginger's ability to boost the immune system before recorded history. Ginger is effective at warming the body and helps break down the accumulation of toxins in organs. Ginger prevents the accumulation of toxins that cause susceptibility to viral, fungal and bacterial infections.
	***Licorice Root*** The Chinese Journal of Virology published a review that confirms the antiviral activity of licorice root due to its triterpenoid content. Another 2010 publication notes licorice's antioxidant, free radical-scavenging and immunostimulant effects.
	***Olive Leaf*** Olive leaf has antiviral properties. Research shows that olive leaf extracts effectively fight against several disease-causing microbes, including some viruses that cause influenza and other respiratory infections. The powerful compounds found in olive leaves destroy invading organisms and prohibit viruses to replicate and cause infection.
	***Oregano*** Oregano oil benefits are proving to be superior to some antibiotics, without the harmful side effects. That's because oregano contains two powerful compounds, carvacrol and thymol, that have powerful antibacterial and antifungal properties. It is the carvacrol that reverses viral infections.

Protocols:

Anti-Viral Protocol:

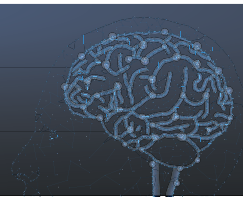
- **Schizandra** *(Anti-viral and natural killer enhancer)*
- **Monolaurin**

> *Mechanism of Action:*
>
> Monolaurin is a monoglyceride derivative of lauric acid, which is found in coconut and human milk. It is used commercially as a surfactant. Monolaurin also might have antiviral activity against rhinoviruses and cytomegalovirus.

- **Viracid**
- **Colloidal Silver. (Argentyn 23)**
- **Medication if needed: valcyte, acyclovir, valtrex**
- **Optional (10-50 grams of Vitamin C a day); such a high dose may need to be administered through infusion**

Myelin Protocol:

- **Lifestyle Practices to Increase Myelin**
  - *Adequate sleep and stress management*
  - *Consider ketogenic diet*
  - *Regular and consistent exercise and physical activity*
- **Nutrition to Increase Myelin**
  - Omega-3 fatty acids; particularly DHA
  - Vitamin D
  - Vitamin C
  - Iodine
  - Zinc
  - Choline and Lecithin
  - Vitamin B12
  - Cholesterol
  - Iron
  - Lithium
  - Vitamin K2
  - Biotin
  - Folate/Vitamin B9
  - Pantothenic Acid/Vitamin B5
  - Copper
  - Phosphatidylserine
- **Hormones to Increase Myelin**
  - Pregnenolone
  - Melatonin
  - Progesterone
  - IGF-1
  - Thyroid Hormones
  - Prolactin
  - VIP
  - Erythropoietin (EPO)
- **Supplements to Increase Myelin**
  - Gotu Kola
  - Uridine
  - Ashwagandha
  - SAMe and Methylation
  - Myoinositol
  - Ozone Treatment
  - Grape Seed Extract
  - Lion's Mane
  - Forskolin/Cyclic AMP
  - PQQ)
  - Ginkgo – after injury
  - Quercetin -after injury



Glossary of Terms

Acute disseminated encephalomyelitis: Acute disseminated encephalomyelitis (ADEM) is characterized by a brief but widespread attack of inflammation in the brain and spinal cord that damages myelin – the protective covering of nerve fibers.

Alzheimer's disease: Alzheimer's disease is the most common cause of dementia — a group of brain disorders that cause the loss of intellectual and social skills.

Aquaporin: Aquaporins are membrane water channels that play critical roles in controlling the water contents of cells.
Ataxia: Ataxia is typically defined as the presence of abnormal, uncoordinated movements.

Autoantibodies: Autoantibodies are antibodies (immune proteins) that mistakenly target and react with one's own tissues or organs. One or more autoantibodies may be produced by a person's immune system when it fails to distinguish "self" from "non-self". Autoantibodies are novel emerging entities that are useful in providing information in early stage of the disease with a simple blood sample.

Autonomic dysfunction: Autonomic dysfunction develops when the nerves of the autonomic nervous system (ANS) are damaged, a condition called autonomic neuropathy or dysautonomia. ANS ranges from mild dysfunction to life-threating dysfunction, affecting part or all of the ANS. The condition can sometimes be reversible and temporary; sometime the condition is chronic (long-term) and irreversible, worsening over time.

Autoimmunity: Autoimmunity is one of the main causes for nervous system diseases, where a misguided immune response attacks body's own organs and tissues. Autoimmune disorders affect 5-10% of the general population and can target virtually any structure within the central or peripheral nervous system in a highly specific way (e.g., Purkinje cells of the cerebellum).

Blood brain barrier: Blood brain barrier (BBB) is a term used to describe the microvasculature properties of the central nervous system (CNS); these properties tightly regulate the movement of molecules, ions and cells between the blood and CNS. The BBB is critical for protecting the CNS system from toxins, pathogens, inflammation, injury and disease. Dysfunction of the BBB can lead to neuronal dysfunction and degeneration.

Cerebellar ataxia: Cerebellar ataxia is a disorder that occurs when the cerebellum becomes inflamed or damaged. The cerebellum is the area of the brain responsible for controlling gait and muscle coordination.

Chronic inflammatory demyelinating polyneuropathy: Chronic inflammatory demyelinating polyneuropathy (CIDP) is a neurological disorder characterized by progressive weakness and impaired sensory function in the legs and arms.

Demyelinating disease: A demyelinating disease is any disease of the nervous system in which the myelin sheath of neurons is damaged. This damage impairs the conduction of signals in the affected nerves.

Encephalitis: Encephalitis is an inflammation of the brain.

Epilepsy: Epilepsy is a CNS (neurological) disorder in which brain activity becomes abnormal, causing seizures or periods of unusual behavior, sensations, and sometimes loss of awareness.

Graves' disease: Graves' disease is an autoimmune disorder that causes hyperthyroidism, or overactive thyroid.

Hashimoto's thyroiditis: Hashimoto's disease is an autoimmune disorder that can cause hypothyroidism, or underactive thyroid.

Huntington's disease: Huntington's disease is an inherited disease that causes the progressive breakdown (degeneration) of nerve cells in the brain.

Multi-focal motor neuropathy: Multifocal motor neuropathy (MMN) is a rare neuropathy characterized by progressive, asymmetric muscle weakness and atrophy (wasting).

Multiple sclerosis: Multiple sclerosis (MS) involves an immune-mediated process in which an abnormal response of the body's immune system is directed against the CNS.

Myasthenia gravis: Myasthenia gravis (MG) is a neuromuscular disorder that causes weakness in the skeletal muscles, which are the muscles your body uses for movement.

Myelination: Myelination is a term in anatomy that is defined as the process of forming a myelin sheath around a nerve to allow nerve impulses to move more quickly.

Neuromuscular disorders: Neuromuscular disorders affect the nerves that control your voluntary muscles and the nerves that communicate sensory information back to the brain. Your nerve cells, also called neurons, send and receive electrical messages to and from the body to help control voluntary muscles. When the neurons become unhealthy or die, the communication between the nervous system and muscles breaks down and results in muscle weakening or wasting away, also known as atrophy.
Neuromyelitis optica: Neuromyelitis optica (NMO), also known as Devic's disease or Devic's syndrome, is a heterogeneous condition consisting of the inflammation and demyelination of the optic nerve (optic neuritis) and the spinal cord (myelitis).
Neuromyotonia: Neuromyotonia (NMT) is a form of peripheral nerve hyperexcitability that causes spontaneous muscular activity resulting from repetitive motor unit action potentials of peripheral origin.

Glossary of Terms

OCD: Obsessive-compulsive disorder (OCD) is an anxiety disorder characterized by recurrent and disturbing thoughts (called obsessions) and/or repetitive, ritualized behaviors that the person feels driven to perform (called compulsions).

Oligodendrocytes: Oligodendrocytes are the myelinating cells of the CNS.

PANDAS: PANDAS is short for Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections.

Paraneoplastic opsoclonus/myoclonus syndrome: Paraneoplastic opsoclonus-myoclonus syndrome (OMS) is a rare complication characterized by chaotic, synchronous eye movements (opsoclonus), spontaneous muscle jerks (myoclonus), and ataxia.

Parkinson's disease: Parkinson's disease is a progressive nervous system disorder that affects movement.

Peripheral neuropathy: Peripheral neuropathy refers to disease related to nerves beyond the brain and spinal cord; it refers to the conditions that result when nerves that carry messages to and from the brain and spinal cord to and from the rest of the body are damaged or diseased.

Rheumatoid arthritis: Rheumatoid arthritis is an autoimmune disease that causes chronic joint inflammation.

Schizophrenia: Schizophrenia is a chronic and severe mental disorder that affects how a person thinks, feels, and behaves.

Sjogren's syndrome: Sjogren's (SHOW-grins) syndrome is a disorder of your immune system identified by its two most common symptoms — dry eyes and a dry mouth.

Systemic lupus erythematosus: Systemic lupus erythematosus (SLE) is a chronic disease that causes inflammation in connective tissues, such as cartilage and the lining of blood vessels, which provide strength and flexibility to structures throughout the body.

Transglutaminases 2, 3 and 6: Transglutaminase 2 (tTG2), Transglutaminase 3 (tTG3) and Transglutaminase 6 (tTG6) are enzymes that catalyze an isopeptide bond formation between a free amine group and the acyl group. The Vibrant Wheat Zoomer includes transglutaminases 2, 3 and 6 which are known to be associated with various disease conditions. Tissue transglutaminase or transglutaminase 2 IgA and IgG profile is one of the most important tests in the diagnostics of celiac disease. tTG is a known autoantigen in celiac disease which has replaced the tissue level tests like antiendomysium antibody test. Clinically tTG has been determined to have a strong sensitivity (99%) and specificity (90%) for identifying celiac disease. While Wheat sensitivity in many cases presents itself as celiac disease in some individuals it is associated with dermatitis herpetiformis. Serum from patients with dermatitis herpetiformis has shown an increased binding towards transglutaminase 3 or epidermal transglutaminase. Gluten sensitivity is sometimes also associated with neurological disorders. This condition also known as gluten ataxia occurs in around 10% of the patients with gluten sensitivity. These patients have been found to have developed antibodies against a different transglutaminase namely transglutaminase 6.

tTG/DGP Complex: tTG/DGP complex comprises of a synthesized peptide which contains a portion of the tTG region and a portion of the DGP region. Recent studies support the hypothesis that a neoepitope may be formed in CD patients' sera under in vivo physiological conditions, by a covalent cross-link between tTG and deamidated gliadin peptides, and this neo-antigen may be specifically recognized by autoantibodies. The tTG/DGP complex could potentially indicate the healing status of celiac disease.

Wheat alpha-amylase and protease inhibitors are reported to be active against the amylases and proteases

Traumatic brain injury: Traumatic brain injury (TBI) is an acute injury to the brain that an occur from a blow, bump, jolt or other cause; a concussion is an example of a mild type of TBI. Symptoms of TBIs may present immediately, but sometimes the symptoms may not present until days or weeks later.

Tourette's syndrome: Tourette syndrome (TS) is a neurological disorder characterized by repetitive, stereotyped, involuntary movements and vocalizations called tics.