



Biomedical Test Panels

See www.OnwardMentalHealth.com (Resources) for an array of integrative mental health material including the latest version of this monograph, extracted from our book, *Choices in Recovery*.



Mental health lab tests look for markers that may identify physical causes of mental health symptoms. A robust set of blood and urine tests should be run, with hair and cerebral spinal fluid potentially evaluated. Regrettably, baseline testing of numerous important physical ailments is not as common as it should be for people diagnosed with serious mental illness.¹

With your practitioner, select a reasonable set of tests based on your symptoms and medical history. See a list of possible tests below. Lab tests should be run by labs with CLIA

certification. Often a baseline test panel is the first choice, and additional tests are run as needed to provide more detailed information.

Individual lab tests to consider.

- **Biochemical imbalance tests.** It is important to discover if any of the six most common mental health biochemical imbalances are present (copper overload, Vitamin B6 deficiency, zinc deficiency, methyl/folate imbalances, oxidative stress overload, and amino acid imbalances).² The following tests should be considered **mandatory**.
 - **Serum copper.** Excess copper can alter synaptic activity for dopamine and norepinephrine.
 - **Plasma Zinc.** Plasma zinc is usually considered the best of the several zinc tests. Zinc helps reduce oxidative stress, and zinc deficiencies can cause copper overload. Zinc and copper levels are related.
 - **Methylation test.** Over 60% of people with depression, anxiety and psychosis have a serious *Methylation* imbalance,³ so testing for methylation irregularities should be considered mandatory. The best methylation test is likely a SAM-e/SAH ratio test. (www.DoctorsData.com is one of the few labs in America that run this test). A suitable alternative is whole blood histamine. People with overmethylation often thrive on vitamin B9, while people with undermethylation often improve depressive symptoms using SAM-e.
 - **Urine Pyrroles.** This test can identify a pyrrole disorder (an imbalance in hemoglobin synthesis) and oxidative stress.
 - **Serum Ceruloplasmin.** Ceruloplasmin is a copper-binding protein. If more than 25% of copper is not bound to ceruloplasmin, a metal metabolism disorder involving oxidative stress may be present.
 - **Amino acid test.** These tests look for potential amino acid abnormalities. In addition, *organic* acid tests can be run to provide detail on intestinal yeast and bacteria which can be helpful to determine proper gastrointestinal function. See Great Plains Laboratory (www.GreatPlainsLaboratory.com).
 - **Liver Enzymes.** Include gamma-GT, aspartate aminotransferase, alanine aminotransferase, bilirubin, albumin, and alkaline phosphatase. Elevated enzymes, a common side effect of psychotropic drugs, suggest that the liver is under stress—which can indicate the need to avoid high doses of vitamins B3, A, D, and E.
- **Endocrine tests.** Endocrine tests look for potential issues with the glands. Of these, the thyroid panel should be considered **mandatory** because thyroid irregularities are relatively common in those with mental health issues. More detailed endocrine testing can be done based on specific situations (e.g. for treatment-resistant depression, rapid-cycling bipolar, and in cases when a woman's psychiatric symptoms seem to vary with the menstrual cycle). If needed, these are often ordered by an endocrinologist.



- **Thyroid Panel.** Test for T3RU, T4, and free T4. Hypothyroidism (underactive thyroid) often accompanies nutrient issues.
- **DHEA and DHEA-sulfate.** Test for DHEA-sulfate levels especially in patients over 40 years of age. If low, DHEA supplementation may improve depression and improve symptoms for those with schizophrenia, bipolar and dementia.
- **Sex-specific tests.** Women should consider tests for estrogen, progesterone, FSH, LH, and Prolactin. Men may be evaluated for free testosterone and bio-available testosterone.
- **ACTH test.** This test is used to diagnose adrenal insufficiency, Addison's disease, and related conditions. It can help distinguish between adrenal and pituitary issues.
- **Cortisol.** The most sensitive test to check for Cushing's syndrome is the amount of cortisol excreted in a 24-hour period. A 24-hour free cortisol level > 100 micrograms indicates possible Cushing's syndrome. It can be confirmed via a CT/MRI/ultrasound scan of the adrenal glands to look for tumors.
- **Plasma parathyroid hormone (PTH) levels.** To test proper functioning of the parathyroid gland. Blood calcium levels are checked at the same time since PTH controls calcium levels.
- **Plasma metanephrines.** Used to determine presence of a rare pheochromocytoma tumor.
- **Allergy Tests.** Food allergies are much more common in those with mental health issues than the overall population, with gluten, soy and corn being the most common. Gluten allergy testing should be considered mandatory, especially for those with schizophrenia. A variety of testing methods are possible including elimination diets. Consider antibody tests for gluten allergy (anti-endomysial – EMA and anti-tissue transglutaminase – tTG) and sensitivity (gliadin - AGA).
- **Lithium.** Many studies show that lithium is broadly important in mental health and may be needed in very small quantities for normal brain growth. It is clearly implicated (as therapy or as a preventive agent) in bipolar, dementia and autism. It can be assessed through hair or blood tests.
- **Heavy Metal/Toxin Tests.** These tests are often run using hair and/or blood samples. These should be considered standard in testing since toxins can be absorbed from many different sources.
- **Homocysteine.** Homocysteine levels are a strong indicator of health and high levels are associated with cognitive impairment in bipolar, schizophrenia, dementia, and depression. Elevated levels can indicate early stage deficiency of folate or vitamins B6 or B12 before blood levels can detect deficiency. Deficiencies in several mood associated vitamins and minerals (folate, vitamins B12 and B6, and zinc) nutrients can lead to an accumulation of homocysteine. Moderately increased plasma homocysteine (>11 μmol/L) is a strong independent risk factor (and a modifiable one) for the development of dementia and Alzheimer's Disease. Homocysteine-lowering treatment with B vitamins markedly slows the rate of brain atrophy and slows cognitive decline.⁴ B-vitamin (B6, B12 and folic acid) stopped memory decline in people with elevated homocysteine.⁵
- **Broad Panel.** This involves testing complete blood count (CBC), glucose, serum urea (kidney function), nitrogen, creatinine, calcium (abnormalities may signal parathyroid issues⁶), phosphate, iron, electrolytes, serum folate, and Vitamins B12 and D. Vitamin B12 and D are especially associated with mental health.
- **Pathogen and inflammation tests.**
 - **C-reactive protein.** C-reactive protein (CRP) is a marker of inflammation. An elevation suggests possible bacterial or viral infection.
 - **HPPHA Test.** HPPHA is a marker for the presence of Clostridia pathogens. Especially in cases of psychosis, severe depression, and autism, consider looking for elevated HPPHA. See Great Plains Laboratory test (www.GreatPlainsLaboratory.com).
 - **Autoimmune.** Psychiatric symptoms can be caused by an autoimmune dysfunction often triggered by common infections. Consider erythrocyte sedimentation rate (detects inflammation), antinuclear antibodies (present in almost all people with systemic lupus erythematosus), and serum fluorescent treponemal antibodies (diagnostic test for syphilis).



- **Translocator proteins.** Elevated levels, a marker for brain inflammation, are associated with suicidal depression.
- **Lipid and Cholesterol Test.** Low Cholesterol levels are a marker of *Error! Reference source not found.* both associated with mental health issues, especially depression. The brain is about 25% fat and requires adequate cholesterol for proper brain health. For some people, statins (cholesterol lowering drugs) can adversely impact memory and cognition.⁷ In fact, there is an FDA warning for statins because of this impact on memory.⁸ Great Plains Laboratory, Inc. has a comprehensive test for cholesterol and fatty acids.
- **Cerebral spinal fluid metabolites.** Tests can be run examining hundreds of metabolites for possible imbalances. These tests provide a view beyond the blood-brain barrier. A preliminary study indicates this testing may be important for treatment-resistant depression, where cerebral folate deficiency was most common imbalance discovered.⁹

Test protocols. A selection of test protocols include:

- **Walsh Institute Test Protocols.** The Walsh Institute is a leader in *Nutrition Therapy* (www.WalshInstitute.org). A testing protocol overview can be found in Chapter 10 of Dr. Walsh's book *Nutrient Power*.
- **Comprehensive Mental Health Panel.** Great Plains Laboratory (www.GreatPlainsLaboratory.com) offers a comprehensive set of mental health panels to consider. They can also connect you with a doctor who can order the tests and consult with you on treatment.
- **Koran Algorithm.** A baseline protocol (<https://goo.gl/nBpmZK>).
- **BMJ Best Practice Assessment for Psychosis.** A protocol directed toward those with psychosis. <http://goo.gl/ibCU2e>.
- **Dr. Raymond J. Pataracchia BSc ND test panel.** An Orthomolecular practitioner. His standard mental health test panel: <https://goo.gl/7q1CGX>.
- **SpectraCell Laboratories.** www.spectracell.com.
- **Great Plains Labs.** Which lab testing is recommended for which condition? Video. <https://goo.gl/rD69GA>.

WHAT CONSIDERATIONS SHOULD I KEEP IN MIND?

Start by considering our *Biomedical Practitioner Finder* at OnwardMentalHealth.com/resources. Seek a practitioner who has extensive experience in using these comprehensive biomedical tests to guide diagnosis and treatment. Running tests without a deep understanding of the implications and interrelationships between the numbers in the results will do little good. Different combinations of tests can be run, and practitioner preferences will vary. Insurance coverage also varies. Common tests are often covered by insurance; more specialized tests may not be.

Failure to run a thorough biomedical test panel risks an important opportunity for healing. If you don't run needed tests, you face the risk of not discovering what might be a relatively straightforward path to improved mental health—keeping in mind that these test results won't automatically guarantee that an underlying disorder will be found.

Professionals and researchers in the mental health field are examining potential genetic and brain imaging solutions. Although these hold promise, they do not provide significant solutions today.

¹ De Hert M et al, Physical illness in patients with severe mental disorders. I. Prevalence, impact of medications and disparities in health care, *World Psychiatry*. 2011, <http://goo.gl/awbVfO>.

² Walsh W, *Nutrient Power*, Skyhorse Publishing, 2014.

³ Walsh W, *Evaluation & treatment of over- and under-methylation in the psychiatric population*, Walsh Research Institute, 2015, <https://goo.gl/aO3nbp>.



⁴ Smith A et al, Homocysteine and Dementia: An International Consensus Statement, J Alzheimers Dis. 2018, [PMCID: PMC5836397](#).

⁵ Smith D et al, Homocysteine-Lowering by B Vitamins Slows the Rate of Accelerated Brain Atrophy in Mild Cognitive Impairment: A Randomized Controlled Trial PLoS One, 2010, [PMCID: PMC2935890](#).

⁶ Bains AS, Abnormal calcium level in a psychiatric presentation? Rule out parathyroid disease, Current Psychiatry 2015, <http://goo.gl/stJRWg>.

⁷ Moyer M, It's Not Dementia, It's Your Heart Medication: Cholesterol Drugs and Memory, Scientific American, 2010, <https://goo.gl/AQbgjV>.

⁸ FDA, FDA Drug Safety Communication: Important safety label changes to cholesterol-lowering statin drugs, 2012, <https://goo.gl/esQvoR>.

⁹ Pan LA et al, Neurometabolic Disorders: Potentially Treatable Abnormalities in Patients With Treatment-Refractory Depression and Suicidal Behavior, Am J Psych, on, line pub, <http://goo.gl/B79g2A>.