

Antidepressants?
**A Natural Functional
Medicine Approach to
Balancing Brain
Chemistry**

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Neurotransmitters

There has been a dramatic increase in the number of people suffering and diagnosed with issues such as depression and anxiety- which are associated with an imbalance of the brain chemicals referred to as neurotransmitters. This is evidenced by the fact that between 1988 and 2008 the use of antidepressants increased nearly 400 percent, and today about 10.4% of Americans take antidepressants. And that number doubles (1 in 5 people) when including all psychotropic medications, such as antipsychotics and drugs used for ADHD. And even within the traditional medical community, there is a recognition that there is a problem with inappropriate prescribing of medications for mental health problems:



“Today, patients often receive psychotropic medications without being evaluated by a mental health professional, according to a study by the Centers for Disease Control & Prevention (CDC). Many Americans visit their primary care physicians and walk away with a prescription for an antidepressant or other drugs without being aware of other evidence -based treatments- such as cognitive behavioral therapy- that might work better for them without the risk of side effects.”
(Monitor on Psychology, June 2012, Vol. 43 No.6)

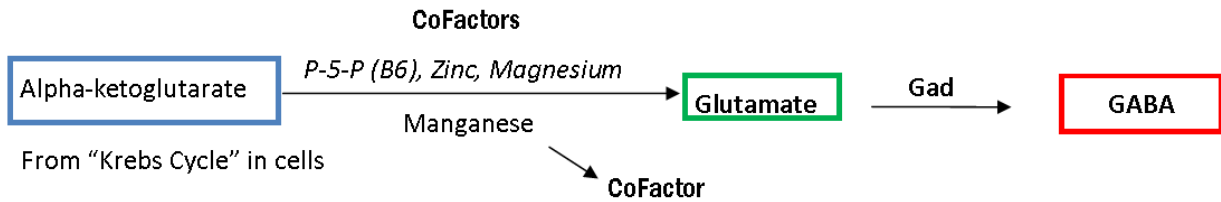


And from a functional medicine perspective there are a number of potential underlying areas of metabolic dysfunction- many of which are all too common in the U.S.- which can either be the actual underlying cause of neurotransmitter imbalances, or at the very least be significantly contributing to these imbalances. That what this booklet is about... a Functional Medicine perspective on the underlying contributing causes and the natural corrective approach to the Four Main Neurotransmitters involved in the common mental health problems of our society.

For each of these Four Neurotransmitters – Acetylcholine, GABA, Dopamine and Serotonin- I will give information on the following aspects:

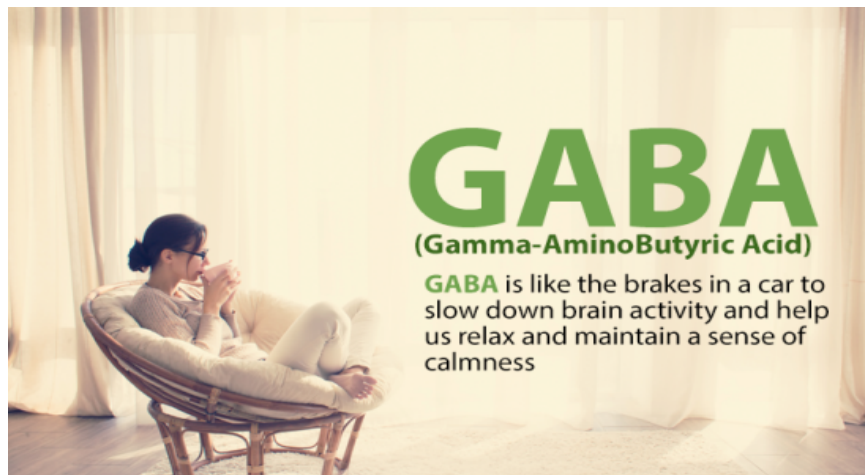
- 1) Signs/Symptoms of Imbalance- This is important as there is currently no definite lab test to measure neurotransmitters. Having said that, there is a functional medicine test called The “Organic Acids test”, which while not measuring actual neurotransmitters, can give insight to their levels by measuring certain organic acid by-products of them in the urine.
- 2) Consumption/Absorption – Neurotransmitters are made in the body from “raw ingredients” consumed in the food we eat. A decrease in either the consumption and or absorption of these raw ingredients can contribute to an imbalance.
- 3) Transport- Sometimes the transport of these raw ingredients from the blood to the brain- where the neurotransmitters are actually made, is interfered with.
- 4) Needed CoFactors- There are necessary key vitamins and or minerals- known as “cofactors” which are required for the production of the neurotransmitters from the raw ingredients.
- 5) Specials Issues – In addition to the above items, for each of the four main neurotransmitters there are other potential issues which can contribute to, or out right cause an imbalance.
- 6) Additional Supporting Compounds – In addition to the needed cofactors to produce the neurotransmitters, there are other natural compounds which can be taken in supplement form that help correct imbalances.

GABA

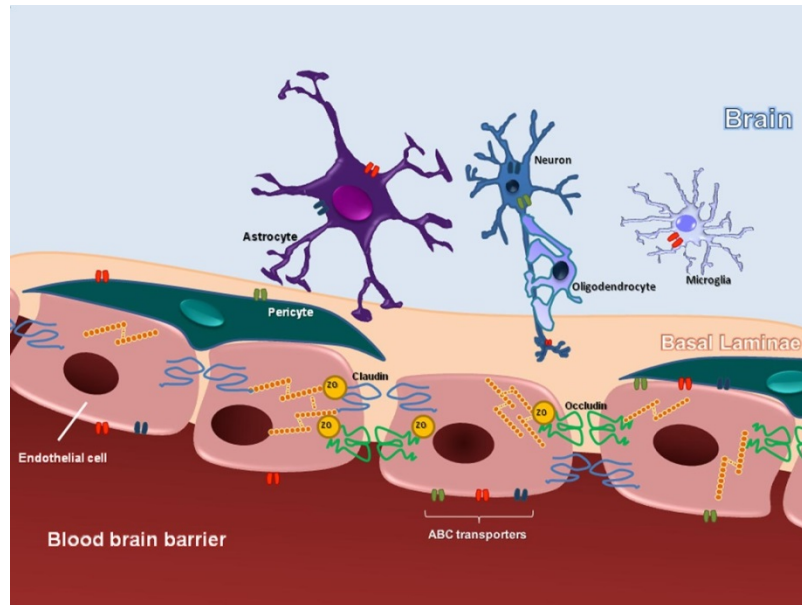


A. Signs/Symptoms of Imbalance

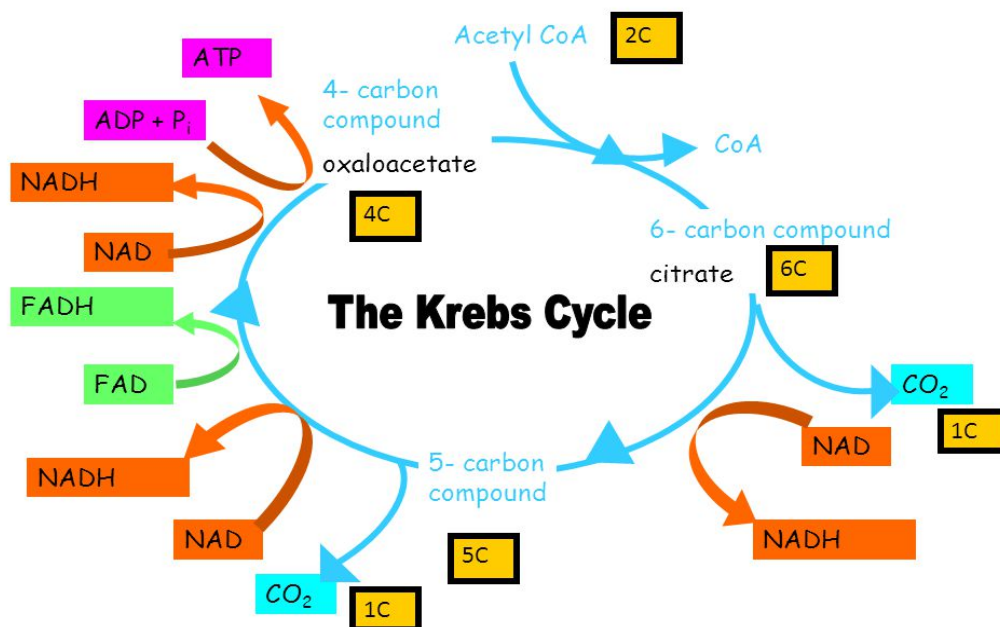
- Feelings of anxiety or panic
- Difficulty shutting mind off
- Restlessness (restless leg syndrome)
- Severely sensitive to light and sound
- Overwhelmed for no reason
- Disorganized attention
- Easily distracted



- B. Consumption/ Absorption:** There is no amino acid that when taken orally will make GABA. There are GABA supplements, but GABA is too large to pass from the blood into the brain, so if there IS a noticed calming effect, this indicates a problem with the "blood brain barrier" which would need to be addressed.



C. Transport: Since GABA is not produced from amino acids (like with serotonin and dopamine) or choline (like with acetylcholine) from the diet, there are no potential transport problems in its production. Instead GABA is made from a by-product (alpha-ketoglutarate) of the glucose metabolism pathway called the “Krebs Cycle” (AKA “citric acid cycle”). This is why people with blood sugar problems such as hypoglycemia or insulin resistance/diabetes can have GABA imbalances.



D. Needed Cofactors:

- Zinc
- Magnesium

- Manganese
- P-5-P (Active B6)

E. Special Issues: The enzyme “GAD” (Glutamic acid decarboxylase), is needed to change glutamate (the most excitatory neurotransmitters) into GABA. It’s not too uncommon for people to have autoimmune attacks against GAD, causing low levels of GABA. The autoimmune issue is especially prevalent in those with a gluten sensitivity. Antibody levels to GAD can be measured on a blood test, confirming this issue.

F. Additional Supporting Compounds:

- Valerian root
 - Lithium orotate
 - Passion flower
 - L-theanine
- } Support the GABAergic System
- L-Taurine
- } Has similar structure to GABA



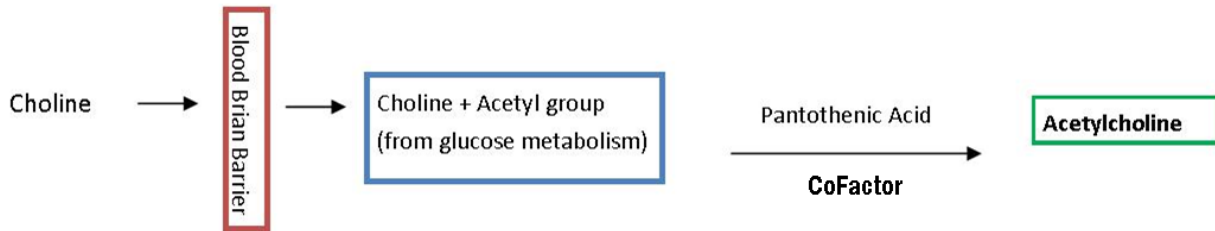
Valerian Root



Passion Flower

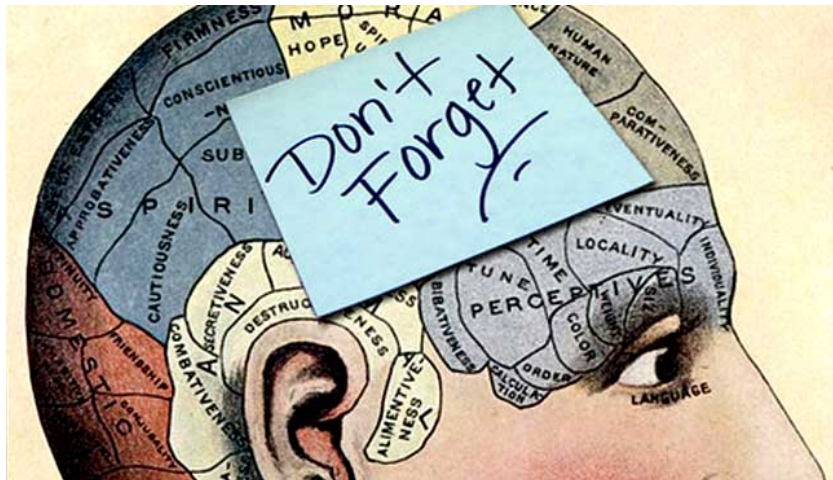
* This statement has not been evaluated by the FDA.

Acetylcholine



A. Signs/ Symptoms of Imbalance

- Constantly losing keys, phone, etc.
- Constantly forgetting where car is parked
- Constantly forgetting appointments
- Memory lapses
- Poor verbal memory
- Slow mental speed
- Difficulty with sense of direction



B. Consumption /Absorption : Choline needed from diet and choline rich foods are:

- Egg yolks
- Fatty meats
- Milk/cream
- Tofu
- Nuts
- Cheese
- Beef
- Liver



Egg Yolks



Nuts

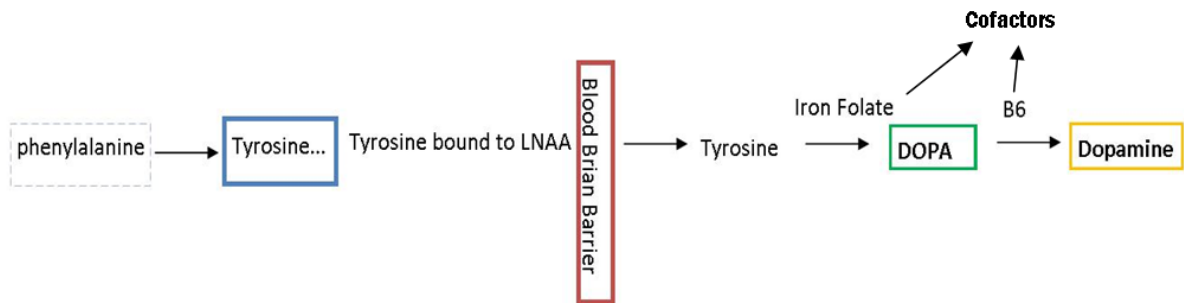
- C. Transport:** No known issues. Choline easily crosses the blood brain barrier.
- D. Needed CoFactors:** Pantothenic acid (B5). It's rare to be deficient in this vitamin though.
- E. Special Issues:** For those who've had their gall bladder removed, special supplemental support to ensure fat digestion and absorption may be needed.

F. Additional Supporting Compounds

- Huperzine A → Increases the sensitivity of acetylcholine receptors *
- Alpha GPC → precursor for acetylcholine
- N-Acetyl L Carnitine → Has similar structure to acetylcholine and precursors for acetylcholine

* This statement has not been evaluated by the FDA.

Dopamine



A. Signs and Symptoms of Imbalance

- Depression with hopelessness/worthlessness
- Loss of motivation
- Slow movements
- Isolation
- Anger episodes/quick to snap
- Inability to handle stress
- Inability to self-motivate
- Need caffeine to stay focused
- Crave chocolate and/or meats
- Constipation with diminished sense of taste



Need Caffeine to Stay Focused



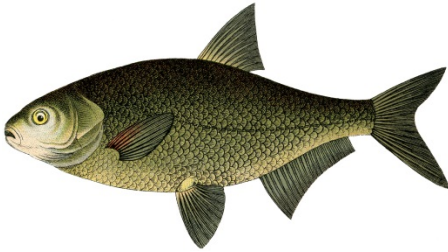
Inability to Handle Stress



Anger Episodes/ Quick to Snap

B. Consumption/ Absorption: Dopamine can be made from either of the amino acids phenylalanine or tyrosine, and phenylalanine rich foods are:

- Beef
- Cheese
- Chocolate
- Eggs
- Fish
- Oats
- Pork
- Turkey



Fish



Oats

Since these are in protein rich foods, a low stomach acid production known as “hypochlorhydria” can interfere with absorption.

C. Transport: Once into the blood, these amino acids require the proper function of a transport vehicle called “LNAA” (large neutral amino acid) in order to actually get into the brain to be made into dopamine. Blood sugar problems/”dysglycemias” – either too low (hypoglycemia) or too high (insulin resistance/diabetes) – interfere with this LNAA

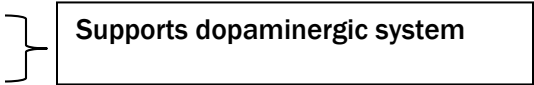
D. Needed CoFactors:

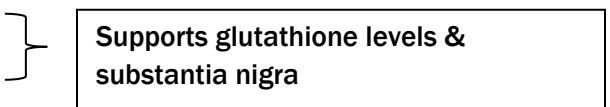
- Iron } Tyrosine to DOPA
- Folate } Tyrosine to DOPA
- P-5-P (Active B6) } DOPA to Dopamine

E. Special Issues: The substantia nigra is the part of the brain that produces dopamine and it’s a degeneration of the substantia nigra that causes Parkinson’s Disease. Also, anyone with “methylation” pathway problem (with or without a MTHFR defect) can have challenges with dopamine levels.

F. Additional Supporting Compounds

- Mucuna pruriens -> natural source of L- dopa, supports the substantia nigra *

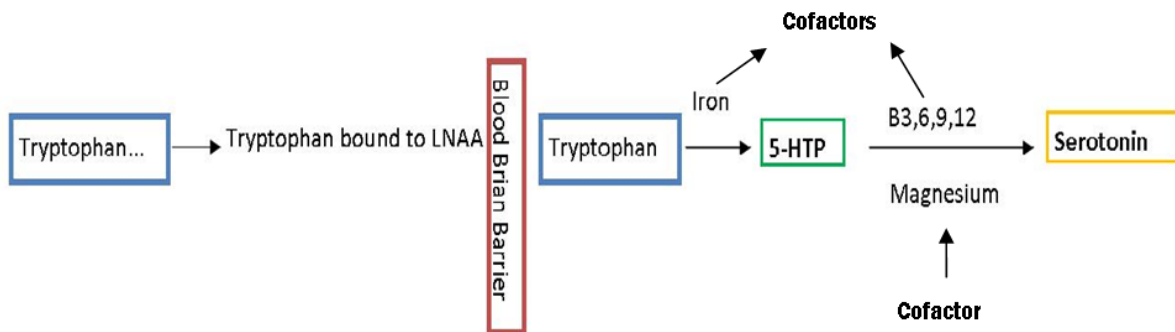
- Beta-phenylethylamine
 - Blueberry
- 
- Supports dopaminergic system

- Alpha Lipoic Acid
 - N-Acetyl L-Cysteine
- 
- Supports glutathione levels & substantia nigra

- Selenium

* This statement has not been evaluated by the FDA.

Serotonin



A. Signs and Symptoms of Imbalance:

- Guilty Depression (“I shouldn’t feel depressed, but I just do.”)
- Can’t find joy from hobbies, friends, music, food, etc.
- Depressed by overcast weather (“seasonal affective disorder”)
- Lack of purpose
- Isolation
- Craving and overeating carbohydrates and sugars



B. Consumption/ Absorption: Serotonin is made from the amino acids tryptophan which is in high amounts in:

- Beef
- Chicken
- Halibut
- Lamb
- Salmon
- Scallops
- Shrimp
- Snapper
- Turkey

- Soybean/Tofu
- Spinach



Beef



Shrimp



Spinach



Soybean

Just like with dopamine, these are mostly protein rich foods that require sufficient stomach acid production to digest and be absorbed, so hypochlorhydria (low stomach acid) will interfere with this process.

C. Transport: Again like with dopamine, dysglycemias (blood sugar imbalances) will interfere with the “LNAA” needed to transport tryptophan into the brain across the blood-brain barrier.

D. Needed CoFactors:

- Iron → Tryptophan to 5-HTP

- Niacinamide (B3)
- P5P (B6)
- Folate (B9)
- Methylcobalamine (B12)
- Magnesium

5 HTP to Serotonin

E. Special Issues: As with dopamine, anyone with “methylation” pathway issue (with or without MTHFR defect) can be more likely to have imbalances with serotonin.

F. Additional Supporting Compounds:

- S-AdoMet → Supports serotonergic system* (methyl donor in the brain)
- 5-HTP → Immediate precursor to serotonin
- St. John's Wort → Supports serotonergic system*



St. John's Wort

* These statements have not been evaluated by the FDA.

In Conclusion

I hope this helps you better understand how there can be a definite possibility for significant improvement in many mental health issues with a natural functional medicine approach. There are many people suffering with depression etc., who have:

- Poor diets with inadequate “raw ingredient” intake
- Digestive issues impairing absorption of the “raw ingredients”
- Blood sugar issues interfering with the transport of necessary amino acids into the brain.
- Deficiencies of cofactors needed for the final steps in producing the neurotransmitters in the brain
- “Methylation” pathway challenges that present an additional element to the picture of neurotransmitter imbalances.

And **none** of these above issues are addressed with **any** of the prescription medications that are so overused. If you are not already a patient of Dr. Beyer’s and would like to pursue a natural functional medicine approach for your mental health issue, please either call or email to request a consultation at

708.478.0690 E-mail: info@drstephenbeyer.com