



NEWSLETTER

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Serotonin Syndrome...A Real Concern?

Serotonin is a key neurotransmitter that is involved in the regulation of sleep, appetite and aggression. Serotonin imbalance is a common contributor to mood problems, and pharmacologic agents that alter serotonin levels are among the most commonly used class of drugs prescribed for anxiety and depression.

Under normal circumstances, nerve cells in the central nervous system produce serotonin that helps regulate attention, behavior and body temperature. Other nerve cells in the body, primarily in the intestines, also produce serotonin. In these other areas, serotonin plays a role in regulating the digestive process, blood flow and breathing.

High stress, insufficient nutrients, fluctuating hormones and the use of stimulant medications or caffeine can all contribute to the depletion of serotonin over time. When serotonin is out of range, depression, anxiety, worry, obsessive thoughts and behaviors, carbohydrate cravings, PMS, difficulty with pain control, and sleep cycle disturbances can result. When these symptoms appear, patients are often treated with pharmaceuticals and/or amino acids and nutrients.

Serotonin syndrome occurs when the patient takes medications or supplements that cause high levels of serotonin to accumulate in the body. It most often occurs when two drugs that affect the body's level of serotonin are taken at the same time and is most frequently seen in patients who are taking a selective serotonin reuptake inhibitor (SSRI) along with a monoamine oxidase inhibitor (MAOI). Popular SSRI's include Celexa, Zoloft, Prozac, Zoloft, Paxil, and Lexapro. (S)SNRI's ((selective) serotonin/norepinephrine reuptake inhibitors) include Cymbalta and Effexor. Other drugs and supplements associated with this condition include bupropion, tricyclic antidepressants, MAOIs, migraine meds, lithium, illicit drugs, St. John's Wort, and others. Additionally, the amino acid precursor 5-Hydroxytryptophan (5-HTP) can contribute to serotonin levels and is therefore often considered a contraindication for use in combination with the medications listed above, though there have been no reported cases in the literature of serotonin syndrome resulting from concurrent use of 5-HTP with reuptake inhibitors.

To be diagnosed with serotonin syndrome, the patient must be taking a drug or supplement that changes the body's serotonin levels and exhibit at least 3 of the following symptoms:

- **Agitation and restlessness**
- **Diarrhea**
- **Heavy sweating not due to activity**
- **Fever**
- **Mental status changes such as confusion**
- **Muscle spasms**
- **Hyperreflexia**

- **Shivering**
- **Tremor**
- **Uncoordinated movements**

Serotonin syndrome is not diagnosed until all other possible causes have been ruled out, including infections, intoxications, metabolic and hormone problems, and drug withdrawal. Some symptoms of serotonin syndrome can mimic those due to an overdose of cocaine, lithium, or an MAOI.

Milder forms of serotonin syndrome may go away within a day of stopping the medications that cause symptoms and, sometimes, taking drugs that block serotonin, however severe serotonin syndrome can be fatal if not treated. For this reason, many practitioners are wary of using any combination of agents (including 5-HTP along with pharmacologic agents) that could theoretically lead to this syndrome.

Neurotransmitter levels can be easily identified with a single, noninvasive urine sample. While the incidence of serotonin syndrome is merely theoretical while utilizing 5-HTP in these patients, testing allows you to check an individual's serotonin level before beginning treatment, monitor levels while on therapy (pharmacological or nutrient based), and adjust when indicated.

Labrix...Test Now, Treat Right.

References:

- *Bear MF, Connors BW, Paradiso MA. Neuroscience: Exploring the Brain, second edition.*
- <http://www.nlm.nih.gov/medlineplus/ency/article/007272.htm>
- www.mayoclinic.org
- *Hinz M, Stein A, Uncini T. Monoamine depletion by reuptake inhibitors. Drug Healthc Patient Saf. 2011;3:69-77.*
- *Zagaria MA. Serotonin Syndrome. Identification, resolution and prevention. US Pharm. 2007;32(11):20-23.*



REGISTRATION IS OPEN!

Labrix West Coast Core Training has been approved for 6 hours of general CE credit (Oregon) for Naturopathic Physicians.

Labrix Founder and Medical Director Dr. Jay Mead, CEO and Associate Medical Director Dr. Erin Lommen, and Staff Physicians Dr. Robyn Kutka, Dr. Lysten Ferris, and Dr. Sara Wood present the fundamentals of hormone balancing, broken down into simple core concepts and related in a single day of engaging presentations and discussions. This event is designed for the provider who is new to the field of hormone balancing or is looking to brush up on the basics.

Join us for this 8-hour training and leave with the tools and knowledge necessary to:

- Identify patients who would benefit from hormone balancing
- Understand the roles of major sex and adrenal hormones in men and women
- Appreciate the relationships between the various hormones and the entire endocrine system
- Recognize the role that sex and adrenal hormones play in several prominent disease processes
- Treat hormone imbalances with nutritional supplements, botanical medicines and BHRT

This event will be held on **Saturday, August 2nd, 2014** at the Hilton Portland & Executive Tower.

Labrix has secured a room block at the rate of \$179/night. [Click here to reserve your room.](#)

If you are serious about adding this powerful tool into your practice, register to attend and secure your seat.



Registration is \$150 and following successful completion of the course, you will receive a \$100 credit on your testing account.

Sign Up Now For This CE Approved Live Webinar Event

Labrix is proud to sponsor the upcoming live webinar on Thursday, June 15 from 6-7pm PST: "Progesterone- A Powerful Hormone for Women and Men." Dr. Gina Nick Cushman, NMD, PhD will present the webinar via FreeCe.com and will discuss utilizing an integrative approach to hormone balance and the prevention and treatment of many of the diseases of aging with the use of bioidentical progesterone.



Dr. Gina Nick Cushman, NMD, PhD

Dr. Gina Nick Cushman, NMD, PhD is a California and Hawaii licensed practicing physician who has treated thousands of patients using BHRT, and trained healthcare professionals worldwide on this emerging treatment modality.

[Click here to learn more about this webinar presentation.](#)
