5-HTP

url: https://medlineplus.gov/druginfo/natural/794.html  
  
5-HTP  
What is it?  
5-hydroxytryptophan (5-HTP) can be converted to serotonin in the body. It is often used for depression. It has less evidence for insomnia and anxiety.   
  
5-HTP is a chemical byproduct of the protein building block L-tryptophan. It is produced commercially from the seeds of an African plant known as Griffonia simplicifolia. 5-HTP works in the brain and central nervous system by increasing the production of the chemical serotonin. Serotonin can affect sleep, appetite, temperature, sexual behavior, and pain sensation.   
  
Since 5-HTP increases serotonin levels, it is used for conditions in which serotonin is believed to play an important role. These include depression, anxiety, and many other conditions, but there is no good scientific evidence to support most of these uses.  
  
  
  
  
How effective is it?  
Natural Medicines Comprehensive Database rates effectiveness based on scientific evidence according to the following scale: Effective, Likely Effective, Possibly Effective, Possibly Ineffective, Likely Ineffective, Ineffective, and Insufficient Evidence to Rate.The effectiveness ratings for 5-HTP are as follows:Possibly effective for...Depression. Taking 5-HTP by mouth seems to improve symptoms of depression in some people. It might work as well as some prescription antidepressant drugs.   
Possibly ineffective for...Down syndrome. Most research shows that taking 5-HTP by mouth does not improve muscle strength or development in children with Down syndrome.   
  
  
There is interest in using 5-HTP for a number of other purposes, but there isn't enough reliable information to say whether it might be helpful.  
  
  
Is it safe?  
When taken by mouth: It is possibly safe to take 5-HTP in doses of up to 400 mg daily for up to one year. The most common side effects include heartburn, stomach pain, nausea, vomiting, diarrhea, drowsiness, sexual problems, and muscle problems. Large doses of 5-HTP, such as 6-10 grams daily, are possibly unsafe. These doses have been linked to severe stomach problems and muscle spasms.  
  
Some people who have taken 5-HTP have developed a serious health condition called eosinophilia-myalgia syndrome (EMS). Some people think EMS might be caused by an accidental contaminant in some 5-HTP products. But there's not enough scientific evidence to know if EMS is caused by 5-HTP, a contaminant, or some other factor. Until more is known, 5-HTP should be used cautiously.   
  
Special precautions & warnings:  
Pregnancy and breast-feeding: There isn't enough reliable information to know if 5-HTP is safe to use when pregnant or breast-feeding. Stay on the safe side and avoid use.  
Children: It is possibly safe for children to take 5-HTP by mouth at appropriate doses. In children under 12 years of age, 5-HTP seems to be safe at a dose of up to 5 mg/kg daily for up to 3 years.  
Surgery: 5-HTP can affect a brain chemical called serotonin. Some drugs administered during surgery can also affect serotonin. Taking 5-HTP before surgery might cause too much serotonin in the brain and can result in serious side effects including heart problems, shivering, and anxiety. Tell patients to stop taking 5-HTP at least 2 weeks before surgery.  
  
  
Are there interactions with medications?  
ModerateBe cautious with this combination.Carbidopa (Lodosyn)5-HTP can affect the brain. Carbidopa can also affect the brain. Taking 5-HTP along with carbidopa can increase the risk of serious side effects including rapid speech, anxiety, aggressiveness, and others.Sedative medications (CNS depressants)5-HTP might cause sleepiness and slowed breathing. Some medications, called sedatives, can also cause sleepiness and slowed breathing. Taking 5-HTP with sedative medications might cause breathing problems and/or too much sleepiness.Serotonergic drugs5-HTP might increase a brain chemical called serotonin. Some medications also have this effect. Taking 5-HTP along with these medications might increase serotonin too much. This might cause serious side effects including heart problems, seizures, and vomiting.  
  
  
Are there interactions with herbs and supplements?  
Herbs and supplements with sedative properties5-HTP might cause sleepiness and slowed breathing. Taking it along with other supplements with similar effects might cause too much sleepiness and/or slowed breathing in some people. Examples of supplements with this effect include hops, kava, L-tryptophan, melatonin, and valerian.Herbs and supplements with serotonergic properties5-HTP increases a brain chemical called serotonin. Taking it along with other supplements that have this effect might cause serious side effects, including heart problems, seizures, and vomiting. Examples of supplements with this effect include black seed, L-tryptophan, SAMe, and St. John's wort.  
  
  
Are there interactions with foods?  
There are no known interactions with foods.  
  
  
How is it typically used?  
5-HTP has most often been used by adults in doses of 150-800 mg daily. Very large doses of 5-HTP, such as 6-10 grams daily, can cause serious side effects and should be avoided. Speak with a healthcare provider to find out what dose might be best for a specific condition.  
  
  
Other names  
2-Amino-3-(5-Hydroxy-1H-Indol-3-yl) Propanoic Acid, 5 Hydroxy-Tryptophan, 5 Hydroxy-Tryptophane, 5-Hydroxytryptophan, 5-Hydroxytryptophane, 5-Hydroxy L-Tryptophan, 5-Hydroxy L-Tryptophane, 5-Hydroxy Tryptophan, 5-L-Hydroxytryptophan, L-5 HTP, L-5-Hydroxytryptophan, L-5-Hydroxytryptophane, Oxitriptan.  
  
  
Methodology  
  
 To learn more about how this article was written, please see the Natural Medicines Comprehensive Database methodology.   
   
  
  
References  
Russo AM, Payet JM, Kent S, Lesku JA, Lowry CA, Hale MW. Acute treatment with 5-hydroxytryptophan increases social approach behaviour but does not activate serotonergic neurons in the dorsal raphe nucleus in juvenile male BALB/c mice: A model of human disorders with deficits of sociability. J Psychopharmacol 2022;36:806-818. View abstract.  
Wu L, Ran L, Wu Y, et al. Oral Administration of 5-Hydroxytryptophan Restores Gut Microbiota Dysbiosis in a Mouse Model of Depression. Front Microbiol 2022;13:864571. View abstract.  
Evans C, Mekhail V, Curtis J, et al. The Effects of 5-HTP on Body Composition: An 8-Week Preliminary RCT. J Diet Suppl 2022. View abstract.  
Nash E, Jamshidi N. Hippocampal ischaemia from accidental 5-Hydroxytryptophan (5-HTP) overdose case report. Clin Neurol Neurosurg 2022;220:107384. View abstract.  
Truyens M, Lobat n T, Ferrante M, et al. Effect of 5-Hydroxytryptophan on Fatigue in Quiescent Inflammatory Bowel Disease: A Randomized Controlled Trial. Gastroenterology 2022;163:1294-1305. View abstract.  
Meloni M, Figorilli M, Carta M, et al. Preliminary finding of a randomized, double-blind, placebo-controlled, crossover study to evaluate the safety and efficacy of 5-hydroxytryptophan on REM sleep behavior disorder in Parkinson's disease. Sleep Breath 2021. View abstract.  
Kn pper J, Girauta MV, Coromina J. Effectiveness of Tinnitan Duo in Subjective Tinnitus with Emotional Affectation: A Prospective, Interventional Study. J Diet Suppl 2021;1-14. View abstract.  
Zamoscik V, Schmidt SNL, Bravo R, et al. Tryptophan-enriched diet or 5-hydroxytryptophan supplementation given in a randomized controlled trial impacts social cognition on a neural and behavioral level. Sci Rep 2021;11:21637. View abstract.  
Maffei ME. 5-Hydroxytryptophan (5-HTP): Natural Occurrence, Analysis, Biosynthesis, Biotechnology, Physiology and Toxicology. Int J Mol Sci. 2020;22:181. View abstract.  
Meloni M, Puligheddu M, Sanna F, et al. Efficacy and safety of 5-Hydroxytryptophan on levodopa-induced motor complications in Parkinson's disease: A preliminary finding. J Neurol Sci. 2020;415:116869. View abstract.  
Yousefzadeh F, Sahebolzamani E, Sadri A, et al. 5-Hydroxytryptophan as adjuvant therapy in treatment of moderate to severe obsessive-compulsive disorder: a double-blind randomized trial with placebo control. Int Clin Psychopharmacol. 2020;35:254-262. View abstract.  
Javelle F, Lampit A, Bloch W, H ussermann P, Johnson SL, Zimmer P. Effects of 5-hydroxytryptophan on distinct types of depression: a systematic review and meta-analysis. Nutr Rev 2020;78:77-88. View abstract.  
Meloni M, Puligheddu M, Carta M, Cannas A, Figorilli M, Defazio G. Efficacy and safety of 5-hydroxytryptophan on depression and apathy in Parkinson's disease: a preliminary finding. Eur J Neurol 2020;27:779-786. View abstract.  
Israelyan N, Del Colle A, Li Z, et al. Effects of Serotonin and Slow-Release 5-Hydroxytryptophan on Gastrointestinal Motility in a Mouse Model of Depression. Gastroenterology. 2019;157:507-521.e4. View abstract.  
Michelson D, Page SW, Casey R, et al. An eosinophilia-myaligia syndrome related disorder associated with exposure to l-5-hydroxytryptophan. J Rheumatol 1994;21:2261-5. View abstract.  
Lemaire PA, Adosraku RK. An HPLC method for the direct assay of the serotonin precursor, 5-hydroxytrophan, in seeds of Griffonia simplicifolia. Phytochem Anal 2002;13:333-7.View abstract.  
Pardo JV. Mania following addition of hydroxytryptophan to monoamine oxidase inhibitor. Gen Hosp Psychiatry 2012;34:102.e13-4.  
Chen D, Liu Y, He W, Wang H, Wang Z. Neurotransmitter-precursor-supplement intervention for detoxified heroin addicts. J Huazhong Univ Sci Technolog Med Sci 2012;32:422-7.  
Gendle MH, Young EL, Romano AC. Effects of oral 5-hydroxytryptophan on a standardized planning task: insight into possible dopamine/serotonin interactions in the forebrain. Hum Psychopharmacol 2013;28:270-3.  
U.S. Food and Drug Administration Pharmacy Compounding Advisory Committee meeting June 17-18, 2015. Available at: www.fda.gov/downloads/advisorycommittees/committeesmeetingmaterials/drugs/pharmacycompoundingadvisorycommittee/ucm455276.pdf (accessed 8/21/15).  
U.S. Food and Drug Administration. Orphan drug designations and approvals. Available at: www.accessdata.fda.gov/scripts/opdlisting/oopd/index.cfm (accessed 8/20/2015).  
Das YT, Bagchi M, Bagchi D, Preuss HG. Safety of 5-hydroxy-L-tryptophan. Toxicol Lett 2004;150:111-22. View abstract.  
Weise P, Koch R, Shaw KN, Rosenfeld MJ. The use of 5-HTP in the treatment of Down's syndrome. Pediatrics 1974;54165-8. View abstract.  
Bazelon M, Paine RS, Cowie VA, et al. Reversal of hypotonia in infants with Down's syndrome by administration of 5-hydroxytryptophan. Lancet 1967;1:1130-3. View abstract.  
 Sano I. Therapy of depression with L-5-hydroxytryptophan (L-5-HTP). Psychiatria et Neurologia Japonicas 1972;74:584.  
 Klein P, Lees A, and Stern G. Consequences of chronic 5-hydroxytryptophan in parkinsonian instability of gait and balance and in other neurological disorders. Adv Neurol 1986;45:603-604.  
 VanPraag, H. M. and Korf, J. 5-Hydroxytryptophan as antidepressant: The predictive value of the probenecid test. Psychopharmacol.Bull. 1972;8:34-35.  
Sicuteri F. 5-hydroxytryptophan in the prophylaxis of migraine. Pharmacological Research Communications 1972;4:213-218.  
 Rosano Burgio, F., Borgatti, R., Scarabello, E., and Lanzi, G. Headache in children and adolescents. Proceedings of the First International Symposium on Headache in Children and Adolecents. 1989;339-47.  
 Mathew NT. 5-hydroxytryptophan in the prophylaxis of migraine: a double-blind study. Headache 1978;18:111.  
De Benedittis G, Massei R. 5-HT precursors in migraine prophylaxis: a double-blind cross-over study with L-5-hydroxytryptophan. Clin J Pain 1986;2:123-129.  
 Wyatt, R. J., Vaughan, T., Kaplan, J., Galanter, M., and Green, R. 5-Hydroxytryptophan and chronic schizophrenia. In: Barchas J and Usdin E. Serotonin and Behavior. New York: Acedemic Press;1973.  
 Brodie HKH, Sack R, and Siever L. Clinical studies of L-5-hydroxytryptophan in depression. In: Barchas J and Usdin E. Serotonin and behavior. New York: Academic Press;1973.  
 Auffret, M., Comte, H., and Bene, J. Eosinophilia-myalgia syndrome induced by L-5 hydroxytryptophane: about three cases. Fund Clin Pharmacol 2013;Suppl 1:poster P2-204.  
Cangiano C, Laviano A, Del Ben M, et al. Effects of oral 5-hydroxy-tryptophan on energy intake and macronutrient selection in non-insulin dependent diabetic patients. Int J Obes Relat Metab Disord 1998;22:648-54. View abstract.  
 Lado-Abeal, J., Rey, C., Cabezas-Agricola, J. M., Rodriguez, A., Camarero, E., and Cabezas-Cerrato, J. L-hydroxytryptophan amplifies pulsatile secretion of LH in the follicular phase of normal women. Clin Endocrinol.(Oxf) 1997;47:555-563. View abstract.  
 Ju, C. Y. and Tsai, C. T. Serotonergic mechanisms involved in the suppression of feeding by 5-HTP in rats. Chin J Physiol 1995;38:235-240. View abstract.  
 Pranzatelli, M. R., Tate, E., Galvan, I., and Wheeler, A. A controlled trial of 5-hydroxy-L-tryptophan for ataxia in progressive myoclonus epilepsy. Clin Neurol.Neurosurg. 1996;98:161-164. View abstract.  
 Frith, C. D., Johnston, E. C., Joseph, M. H., Powell, R. J., and Watts, R. W. Double-blind clinical trial of 5-hydroxytryptophan in a case of Lesch- Nyhan syndrome. J Neurol Neurosurg.Psychiatry 1976;39:656-662. View abstract.  
 Bastard, J., Truelle, J. L., and Emile, J. [Effectiveness of 5 hydroxy-tryptophan in Parkinson's disease]. Nouv Presse Med 9-11-1976;5:1836-1837. View abstract.  
Trouillas P, Serratrice G, Laplane D, et al. Levorotatory form of 5-hydroxytryptophan in Friedreich's ataxia. Results of a double-blind drug-placebo cooperative study. Arch Neurol 1995;52:456-60. View abstract.  
Wessel K, Hermsd rfer J, Deger K, et al. Double-blind crossover study with levorotatory form of hydroxytryptophan in patients with degenerative cerebellar diseases. Arch Neurol 1995;52:451-5. View abstract.  
 Alino, J. J., Gutierrez, J. L., and Iglesias, M. L. 5-Hydroxytryptophan (5-HTP) and a MAOI (nialamide) in the treatment of depressions. A double-blind controlled study. Int Pharmacopsychiatry 1976;11:8-15. View abstract.  
 Pranzatelli, M. R., Tate, E., Huang, Y., Haas, R. H., Bodensteiner, J., Ashwal, S., and Franz, D. Neuropharmacology of progressive myoclonus epilepsy: response to 5- hydroxy-L-tryptophan. Epilepsia 1995;36:783-791. View abstract.  
 Thomson, J., Rankin, H., Ashcroft, G. W., Yates, C. M., McQueen, J. K., and Cummings, S. W. The treatment of depression in general practice: a comparison of L- tryptophan, amitriptyline, and a combination of L-tryptophan and amitriptyline with placebo. Psychol Med 1982;12:741-751. View abstract.  
 Trouillas, P., Garde, A., Robert, J. M., Renaud, B., Adeleine, P., Bard, J., and Brudon, F. [Regression of the cerebellar syndrome under long-term administration of 5-HTP or the combination of 5-HTP and benserazide. 26 cases quantified and treated using computer methods]. Rev Neurol.(Paris) 1982;138:415-435. View abstract.  
 Thal, L. J., Sharpless, N. S., Wolfson, L., and Katzman, R. Treatment of myoclonus with L-5-hydroxytryptophan and carbidopa: clinical, electrophysiological, and biochemical observations. Ann Neurol 1980;7:570-576. View abstract.  
van Hiele LJ. l-5-Hydroxytryptophan in depression: the first substitution therapy in psychiatry? The treatment of 99 out-patients with 'therapy-resistant' depressions. Neuropsychobiology 1980;6:230-40. View abstract.  
 Magnussen, I. and Nielsen-Kudsk, F. Bioavailability and related pharmacokinetics in man of orally administered L-5-hydroxytryptophan in steady state. Acta Pharmacol Toxicol.(Copenh) 1980;46:257-262. View abstract.  
 Trouillas, P., Garde, A., Robert, J. M., and Adeleine, P. [Regression of human cerebellar ataxia under long term administration of 5-hydroxytryptophan]. C.R.Seances Acad Sci III 1-5-1981;292:119-122. View abstract.  
Pueschel SM, Reed RB, Cronk CE, Goldstein BI. 5-hydroxytryptophan and pyridoxine. Their effects in young children with Down's syndrome. Am J Dis Child 1980;134:838-44. View abstract.  
Longo G, Rudoi I, Iannuccelli M, Strinati R, Panizon F. [Treatment of essential headache in developmental age with L-5-HTP (cross over double-blind study versus placebo)]. Pediatr Med Chir 1984;6:241-5. View abstract.  
 Bono, G., Micieli, G., Sances, G., Calvani, M., and Nappi, G. L-5HTP treatment in primary headaches: an attempt at clinical identification of responsive patients. Cephalalgia 1984;4:159-165. View abstract.  
 Quadbeck, H., Lehmann, E., and Tegeler, J. Comparison of the antidepressant action of tryptophan, tryptophan/5- hydroxytryptophan combination and nomifensine. Neuropsychobiology 1984;11:111-115. View abstract.  
 van Praag, H. M. In search of the mode of action of antidepressants: 5-HTP/tyrosine mixtures in depression. Adv Biochem Psychopharmacol. 1984;39:301-314. View abstract.  
 Trouillas P. Regression of cerebellar syndrome with long-term administration of 5-HTP or the combination of 5-HTP-benserazide: 21 cases with quantified symptoms processed by computer. Ital J Neurol Sci 1984;5:253-266. View abstract.  
 Magnussen, I. and Van Woert, M. H. Human pharmacokinetics of long term 5-hydroxytryptophan combined with decarboxylase inhibitors. Eur.J Clin Pharmacol 1982;23:81-86. View abstract.  
Magnussen, I., Jensen, T. S., Rand, J. H., and Van Woert, M. H. Plasma accumulation of metabolism of orally administered single dose L- 5-hydroxytryptophan in man. Acta Pharmacol.Toxicol.(Copenh) 1981;49:184-189. View abstract.  
 van Praag, H. M. and de Haan, S. Chemoprophylaxis of depressions. An attempt to compare lithium with 5- hydroxytryptophan. Acta Psychiatr.Scand Suppl 1981;290:191-201. View abstract.  
 van Praag, H. and de Hann, S. Depression vulnerability and 5-hydroxytryptophan prophylaxis. Psychiatry Res. 1980;3:75-83. View abstract.  
 Soulairac, A. [Hypnotic action of mecloqualone. Comparison with placebo effects and secobarbital]. Presse Med 4-10-1971;79:817-818. View abstract.  
 Chase, T. N., Ng, L. K., and Watanabe, A. M. Parkinson's disease. Modification by 5-hydroxytryptophan. Neurology 1972;22:479-484. View abstract.  
 Wyatt, R. J., Vaughan, T., Galanter, M., Kaplan, J., and Green, R. Behavioral changes of chronic schizophrenic patients given L-5- hydroxytryptophan. Science 9-22-1972;177:1124-1126. View abstract.  
van Praag HM, Korf J, Dols LC, Schut T. A pilot study of the predictive value of the probenecid test in application of 5-hydroxytryptophan as antidepressant. Psychopharmacologia 1972;25:14-21. View abstract.  
 Zarcone, V., Kales, A., Scharf, M., Tan, T. L., Simmons, J. Q., and Dement, W. C. Repeated oral ingestion of 5-hydroxytryptophan. The effect on behavior and sleep processes in two schizophrenic children. Arch Gen Psychiatry 1973;28:843-846. View abstract.  
 Chadwick, D., Hallett, M., Harris, R., Jenner, P., Reynolds, E. H., and Marsden, C. D. Clinical, biochemical, and physiological features distinguishing myoclonus responsive to 5-hydroxytryptophan, tryptophan with a monoamine oxidase inhibitor, and clonazepam. Brain 1977;100:455-487. View abstract.  
 Van Woert, M. H., Rosenbaum, D., Howieson, J., and Bowers, M. B., Jr. Long-term therapy of myoclonus and other neurologic disorders with L-5- hydroxytryptophan and carbidopa. N Engl J Med 1-13-1977;296:70-75. View abstract.  
Nolen WA, van de Putte JJ, Dijken WA, Kamp JS. L-5HTP in depression resistant to re-uptake inhibitors. An open comparative study with tranylcypromine. Br J Psychiatry 1985;147:16-22. View abstract.  
De Benedittis G, Massei R. Serotonin precursors in chronic primary headache. A double-blind cross-over study with L-5-hydroxytryptophan vs. placebo. J Neurosurg Sci 1985;29:239-48. View abstract.  
Titus F, D valos A, Alom J, Codina A. 5-Hydroxytryptophan versus methysergide in the prophylaxis of migraine. Randomized clinical trial. Eur Neurol 1986;25:327-9. View abstract.  
Santucci M, Cortelli P, Rossi PG, Baruzzi A, Sacquegna T. L-5-hydroxytryptophan versus placebo in childhood migraine prophylaxis: a double-blind crossover study. Cephalalgia 1986;6:155-7. View abstract.  
 Irwin, M. R., Marder, S. R., Fuentenebro, F., and Yuwiler, A. L-5-hydroxytryptophan attenuates positive psychotic symptoms induced by D-amphetamine. Psychiatry Res. 1987;22:283-289. View abstract.  
 Sueldo, C. E., Duda, M., and Kletzky, O. A. Influence of sequential doses of 5-hydroxytryptophan on prolactin release. Am J Obstet.Gynecol. 1986;154:424-427. View abstract.  
Angst J, Woggon B, Schoepf J. The treatment of depression with L-5-hydroxytryptophan versus imipramine. Results of two open and one double-blind study. Arch Psychiatr Nervenkr 1977;224:175-86. View abstract.  
Kahn RS, Westenberg HG, Verhoeven WM, et al. Effect of a serotonin precursor and uptake inhibitor in anxiety disorders; a double-blind comparison of 5-hydroxytryptophan, clomipramine and placebo. Int Clin Psychopharmacol 1987;21:33-45. View abstract.  
De Giorgis G, Miletto R, Iannuccelli M, Camuffo M, Scerni S. Headache in association with sleep disorders in children: a psychodiagnostic evaluation and controlled clinical study--L-5-HTP versus placebo. Drugs Exp Clin Res 1987;13:425-33. View abstract.  
 Zmilacher, K., Battegay, R., and Gastpar, M. L-5-hydroxytryptophan alone and in combination with a peripheral decarboxylase inhibitor in the treatment of depression. Neuropsychobiology 1988;20:28-35. View abstract.  
 Nolen, W. A., van de Putte, J. J., Dijken, W. A., Kamp, J. S., Blansjaar, B. A., Kramer, H. J., and Haffmans, J. Treatment strategy in depression. II. MAO inhibitors in depression resistant to cyclic antidepressants: two controlled crossover studies with tranylcypromine versus L-5-hydroxytryptophan and nomifensine. Acta Psychiatr.Scand 1988;78:676-683. View abstract.  
Kaneko M, Kumashiro H, Takahashi Y, Hoshino Y. L-5HTP treatment and serum 5-HT level after L-5-HTP loading on depressed patients. Neuropsychobiology 1979;5:232-40. View abstract.  
 Magnussen, I. and Nielsen-Kudsk, F. Pharmacokinetics of intravenously administered L-5-hydroxytryptophan in man. Acta Pharmacol.Toxicol.(Copenh) 1979;44:308-314. View abstract.  
Rousseau JJ. Effects of a levo-5-hydroxytryptophan-dihydroergocristine combination on depression and neuropsychic performance: a double-blind placebo-controlled clinical trial in elderly patients. Clin Ther 1987;9:267-72. View abstract.  
 Anders, T. F., Cann, H. M., Ciaranello, R. D., Barchas, J. D., and Berger, P. A. Further observations on the use of 5-hydroxytryptophan in a child with Lesch-Nyhan syndrome. Neuropadiatrie. 1978;9:157-166. View abstract.  
Ceci F, Cangiano C, Cairella M, et al. The effects of oral 5-hydroxytryptophan administration on feeding behavior in obese adult female subjects. J Neural Transm 1989;76:109-17. View abstract.  
Jangid P, Malik P, Singh P, Sharma M, Gulia AK. Comparative study of efficacy of l-5-hydroxytryptophan and fluoxetine in patients presenting with first depressive episode. Asian J Psychiatr 2013;6:29-34. View abstract.  
 Zarcone, V. P., Jr. and Hoddes, E. Effects of 5-hydroxytryptophan on fragmentation of REM sleep in alcoholics. Am J Psychiatry 1975;132:74-76. View abstract.  
 Hallin, M. L., Mahmoud, K., Viswanath, A., and Gama, R. 'Sweet Dreams', 'Happy Days' and elevated 24-h urine 5-hydroxyindoleacetic acid excretion. Ann Clin Biochem. 2013;50(Pt 1):80-82. View abstract.  
 Opladen, T., Hoffmann, G. F., and Blau, N. An international survey of patients with tetrahydrobiopterin deficiencies presenting with hyperphenylalaninaemia. J Inherit.Metab Dis 2012;35:963-973. View abstract.  
 Baraldi, S., Hepgul, N., Mondelli, V., and Pariante, C. M. Symptomatic treatment of interferon-alpha-induced depression in hepatitis C: a systematic review. J Clin Psychopharmacol. 2012;32:531-543. View abstract.  
 Pan, L., McKain, B. W., Madan-Khetarpal, S., Mcguire, M., Diler, R. S., Perel, J. M., Vockley, J., and Brent, D. A. GTP-cyclohydrolase deficiency responsive to sapropterin and 5-HTP supplementation: relief of treatment-refractory depression and suicidal behaviour. BMJ Case.Rep. 2011;2011 View abstract.  
 Friedman, J., Roze, E., Abdenur, J. E., Chang, R., Gasperini, S., Saletti, V., Wali, G. M., Eiroa, H., Neville, B., Felice, A., Parascandalo, R., Zafeiriou, D. I., Arrabal-Fernandez, L., Dill, P., Eichler, F. S., Echenne, B., Gutierrez-Solana, L. G., Hoffmann, G. F., Hyland, K., Kusmierska, K., Tijssen, M. A., Lutz, T., Mazzuca, M., Penzien, J., Poll-The BT, Sykut-Cegielska, J., Szymanska, K., Thony, B., and Blau, N. Sepiapterin reductase deficiency: a treatable mimic of cerebral palsy. Ann Neurol. 2012;71:520-530. View abstract.  
Jukic T, Rojc B, Boben-Bardutzky D, Hafner M, Ihan A. The use of a food supplementation with D-phenylalanine, L-glutamine and L-5-hydroxytriptophan in the alleviation of alcohol withdrawal symptoms. Coll Antropol 2011;35:1225-30. View abstract.  
 Sarris, J. Clinical depression: an evidence-based integrative complementary medicine treatment model. Altern.Ther.Health Med. 2011;17:26-37. View abstract.  
 Dill, P., Wagner, M., Somerville, A., Thony, B., Blau, N., and Weber, P. Child neurology: paroxysmal stiffening, upward gaze, and hypotonia: hallmarks of sepiapterin reductase deficiency. Neurology 1-31-2012;78:e29-e32. View abstract.  
 Horvath, G. A., Selby, K., Poskitt, K., Hyland, K., Waters, P. J., Coulter-Mackie, M., and Stockler-Ipsiroglu, S. G. Hemiplegic migraine, seizures, progressive spastic paraparesis, mood disorder, and coma in siblings with low systemic serotonin. Cephalalgia 2011;31:1580-1586. View abstract.  
 Morrison, K. E. Whole-genome sequencing informs treatment: personalized medicine takes another step forward. Clin Chem 2011;57:1638-1640. View abstract.  
 Bainbridge, M. N., Wiszniewski, W., Murdock, D. R., Friedman, J., Gonzaga-Jauregui, C., Newsham, I., Reid, J. G., Fink, J. K., Morgan, M. B., Gingras, M. C., Muzny, D. M., Hoang, L. D., Yousaf, S., Lupski, J. R., and Gibbs, R. A. Whole-genome sequencing for optimized patient management. Sci Transl.Med 6-15-2011;3:87re3. View abstract.  
den Boer JA, Westenberg HG. Behavioral, neuroendocrine, and biochemical effects of 5-hydroxytryptophan administration in panic disorder. Psychiatry Res 1990;31:267-78. View abstract.  
 Adamsen, D., Meili, D., Blau, N., Thony, B., and Ramaekers, V. Autism associated with low 5-hydroxyindolacetic acid in CSF and the heterozygous SLC6A4 gene Gly56Ala plus 5-HTTLPR L/L promoter variants. Mol.Genet.Metab 2011;102:368-373. View abstract.  
 Cross, D. R., Kellermann, G., McKenzie, L. B., Purvis, K. B., Hill, G. J., and Huisman, H. A randomized targeted amino acid therapy with behaviourally at-risk adopted children. Child Care Health Dev. 2011;37:671-678. View abstract.  
 Gendle, M. H. and Golding, A. C. Oral administration of 5-hydroxytryptophan (5-HTP) impairs decision making under ambiguity but not under risk: evidence from the Iowa Gambling Task. Hum Psychopharmacol. 2010;25:491-499. View abstract.  
 Iovieno, N., Dalton, E. D., Fava, M., and Mischoulon, D. Second-tier natural antidepressants: review and critique. J Affect.Disord. 2011;130:343-357. View abstract.  
Leu-Semenescu, S., Arnulf, I., Decaix, C., Moussa, F., Clot, F., Boniol, C., Touitou, Y., Levy, R., Vidailhet, M., and Roze, E. Sleep and rhythm consequences of a genetically induced loss of serotonin. Sleep 3-1-2010;33:307-314. View abstract.  
Freedman RR. Treatment of menopausal hot flashes with 5-hydroxytryptophan. Maturitas 2010;65:383-5. View abstract.  
 Weeks, B. S. Formulations of dietary supplements and herbal extracts for relaxation and anxiolytic action: Relarian. Med Sci Monit. 2009;15:RA256-RA262. View abstract.  
Rondanelli M, Klersy C, Iadarola P, et al. Satiety and amino-acid profile in overweight women after a new treatment using a natural plant extract sublingual spray formulation. Int J Obes (Lond) 2009;33:1174-1182. View abstract.  
Maissen CP, Ludin HP. [Comparison of the effect of 5-hydroxytryptophan and propranolol in the interval treatment of migraine]. Schweiz Med Wochenschr 1991;121:1585-90. View abstract.  
Shell W, Bullias D, Charuvastra E, et al. A randomized, placebo-controlled trial of an amino acid preparation on timing and quality of sleep. Am J Ther 2010;17:133-9. View abstract.  
 Trujillo-Martin, M. M., Serrano-Aguilar, P., Monton-Alvarez, F., and Carrillo-Fumero, R. Effectiveness and safety of treatments for degenerative ataxias: a systematic review. Mov Disord. 6-15-2009;24:1111-1124. View abstract.  
 Rothman, R. B. Treatment of obesity with "combination" pharmacotherapy. Am J Ther 2010;17:596-603. View abstract.  
 Chae, H. S., Kang, O. H., Choi, J. G., Oh, Y. C., Lee, Y. S., Jang, H. J., Kim, J. H., Park, H., Jung, K. Y., Sohn, D. H., and Kwon, D. Y. 5-hydroxytryptophan acts on the mitogen-activated protein kinase extracellular-signal regulated protein kinase pathway to modulate cyclooxygenase-2 and inducible nitric oxide synthase expression in RAW 264.7 cells. Biol Pharm Bull 2009;32:553-557. View abstract.  
 Hendricks, E. J., Rothman, R. B., and Greenway, F. L. How physician obesity specialists use drugs to treat obesity. Obesity.(Silver.Spring) 2009;17:1730-1735. View abstract.  
 Longo, N. Disorders of biopterin metabolism. J Inherit.Metab Dis 2009;32:333-342. View abstract.  
 Pons, R. The phenotypic spectrum of paediatric neurotransmitter diseases and infantile parkinsonism. J Inherit.Metab Dis 2009;32:321-332. View abstract.  
 Schaefer, M., Winterer, J., Sarkar, R., Uebelhack, R., Franke, L., Heinz, A., and Friebe, A. Three cases of successful tryptophan add-on or monotherapy of hepatitis C and IFNalpha-associated mood disorders. Psychosomatics 2008;49:442-446. View abstract.  
 Jacobsen, J. P., Nielsen, E. O., Hummel, R., Redrobe, J. P., Mirza, N., and Weikop, P. Insensitivity of NMRI mice to selective serotonin reuptake inhibitors in the tail suspension test can be reversed by co-treatment with 5-hydroxytryptophan. Psychopharmacology (Berl) 2008;199:137-150. View abstract.  
 Liu, K. M., Liu, T. T., Lee, N. C., Cheng, L. Y., Hsiao, K. J., and Niu, D. M. Long-term follow-up of Taiwanese Chinese patients treated early for 6-pyruvoyl-tetrahydropterin synthase deficiency. Arch Neurol. 2008;65:387-392. View abstract.  
 Horvath, G. A., Stockler-Ipsiroglu, S. G., Salvarinova-Zivkovic, R., Lillquist, Y. P., Connolly, M., Hyland, K., Blau, N., Rupar, T., and Waters, P. J. Autosomal recessive GTP cyclohydrolase I deficiency without hyperphenylalaninemia: evidence of a phenotypic continuum between dominant and recessive forms. Mol.Genet.Metab 2008;94:127-131. View abstract.  
 Morrow, J. D., Vikraman, S., Imeri, L., and Opp, M. R. Effects of serotonergic activation by 5-hydroxytryptophan on sleep and body temperature of C57BL/6J and interleukin-6-deficient mice are dose and time related. Sleep 1-1-2008;31:21-33. View abstract.  
 Meolie, A. L., Rosen, C., Kristo, D., Kohrman, M., Gooneratne, N., Aguillard, R. N., Fayle, R., Troell, R., Townsend, D., Claman, D., Hoban, T., and Mahowald, M. Oral nonprescription treatment for insomnia: an evaluation of products with limited evidence. J Clin.Sleep Med 4-15-2005;1:173-187. View abstract.  
Cangiano C, Ceci F, Cairella M, et al. Effects of 5-hydroxytryptophan on eating behavior and adherence to dietary prescriptions in obese adult subjects. Adv Exp Med Biol 1991;294:591-3. View abstract.  
 Halford, J. C., Harrold, J. A., Boyland, E. J., Lawton, C. L., and Blundell, J. E. Serotonergic drugs : effects on appetite expression and use for the treatment of obesity. Drugs 2007;67:27-55. View abstract.  
 Petre-Quadens, O. and De Lee, C. 5-Hydroxytryptophan and sleep in Down's syndrome. J Neurol Sci 1975;26:443-453. View abstract.  
 Lesch, K. P., Hoh, A., Disselkamp-Tietze, J., Wiesmann, M., Osterheider, M., and Schulte, H. M. 5-Hydroxytryptamine1A receptor responsivity in obsessive-compulsive disorder. Comparison of patients and controls. Arch Gen Psychiatry 1991;48:540-547. View abstract.  
 Halladay, A. K., Wagner, G. C., Sekowski, A., Rothman, R. B., Baumann, M. H., and Fisher, H. Alterations in alcohol consumption, withdrawal seizures, and monoamine transmission in rats treated with phentermine and 5-hydroxy-L-tryptophan. Synapse 2006;59:277-289. View abstract.  
 Curcio, J. J., Kim, L. S., Wollner, D., and Pockaj, B. A. The potential of 5-hydryoxytryptophan for hot flash reduction: a hypothesis. Altern Med Rev 2005;10:216-221. View abstract.  
 Victor, S. and Ryan, S. W. Drugs for preventing migraine headaches in children. Cochrane Database.Syst.Rev 2003;:CD002761. View abstract.  
George DT, Lindquist T, Rawlings RR, et al. Pharmacologic maintenance of abstinence in patients with alcoholism: no efficacy of 5-hydroxytryptophan or levodopa. Clin Pharmacol Ther 1992;52:553-60. View abstract.  
 Shaw, K., Turner, J., and Del Mar, C. Tryptophan and 5-hydroxytryptophan for depression. Cochrane Database.Syst Rev 2002;:CD003198. View abstract.  
 Ciaranello, R. D., Anders, T. F., Barchas, J. D., Berger, P. A., and Cann, H. M. The use of 5-hydroxytryptophan in a child with Lesch-Nyhan syndrome. Child Psychiatry Hum Dev 1976;7:127-133. View abstract.  
 Anderson, L. T., Herrmann, L., and Dancis, J. The effect of L-5-hydroxytryptophan on self-mutilatin in Lesch-Nyhan disease: a negative report. Neuropadiatrie. 1976;7:439-442. View abstract.  
 Growdon, J. H., Young, R. R., and Shahani, B. T. L-5-hydroxytryptophan in treatment of several different syndromes in which myoclonus is prominent. Neurology 1976;26:1135-1140. View abstract.  
 Joseph, M. H. and Baker, H. F. The determination of 5-hydroxytryptophan and its metabolites in plasma following administration to man. Clin.Chim.Acta 10-1-1976;72:125-131. View abstract.  
Takahashi S, Kondo H, Kato N. Effect of l-5-hydroxytryptophan on brain monoamine metabolism and evaluation of its clinical effect in depressed patients. J Psychiatr Res 1975;12:177-87. View abstract.  
Preshaw RM, Leavitt D, Hoag G. The dietary supplement 5-hydroxytryptophan and urinary 5-hydroxyindole acetic acid. CMAJ 2008;178:993. View abstract.  
Byerley WF, Judd LL, Reimherr FW, Grosser BI. 5-Hydroxytryptophan: a review of its antidepressant efficacy and adverse effects. J Clin Psychopharmacol 1987;7:127-37.. View abstract.  
Shaw K, Turner J, Del Mar C. Tryptophan and 5-hydroxytryptophan for depression. Cochrane Database Syst Rev 2002;:CD003198. View abstract.  
Caruso I, Sarzi Puttini P, Cazzola M, Azzolini V. Double-blind study of 5-hydroxytryptophan versus placebo in the treatment of primary fibromyalgia syndrome. J Int Med Res 1990;18:201-9. View abstract.  
Johnson KL, Klarskov K, Benson LM, et al. Presence of peak X and related compounds: the reported contaminant in case related 5-hydroxy-L-tryptophan associated with eosinophilia-myalgia syndrome. J Rheumatol 1999;26:2714-7. View abstract.  
Singhal AB, Caviness VS, Begleiter AF, et al. Cerebral vasoconstriction and stroke after use of serotonergic drugs. Neurology 2002;58:130-3. View abstract.  
U. S. Food and Drug Administration, Center for Food Safety and Applied Nutrition, Office of Nutritional Products, Labeling, and Dietary Supplements. Information Paper on L-Tryptophan and 5-hydroxy-L-tryptophan, February 2001.  
Nardini M, De Stefano R, Iannuccelli M, et al. Treatment of depression with L-5-hydroxytryptophan combined with chlorimipramine, a double-blind study. Int J Clin Pharmacol Res 1983;3:239-50. View abstract.  
Ribeiro CA. L-5-Hydroxytryptophan in the prophylaxis of chronic tension-type headache: a double-blind, randomized, placebo-controlled study. Headache 2000;40:451-6. View abstract.  
Poldinger W, Calanchini B, Schwarz W. A functional-dimensional approach to depression: serotonin deficiency as a target syndrome in a comparison of 5-hydroxytryptophan and fluvoxamine. Psychopathology 1991;24:53-81. View abstract.  
Sternberg EM, Van Woert MH, Young SN, et al. Development of a scleroderma-like illness during therapy with L-5-hydroxytryptophan and carbidopa. N Engl J Med 1980;303:782-7. View abstract.  
U.S. Food and Drug Administration. Impurities confirmed in dietary supplement 5-hydroxy-L-tryptophan. FDA Talk Paper, August 31, 1998; T98-48.  
Meyer JS, Welch KM, Deshmukh VD, et al. Neurotransmitter precursor amino acids in the treatment of multi-infarct dementia and Alzheimer's disease. J Amer Geriat Soc 1977;25:289-98. View abstract.  
Trouillas P, Brudon F, Adeleine P. Improvement of cerebellar ataxia with levorotatory form of 5-hydroxytryptophan: a double-blind study with quantified data processing. Arch Neurol 1988;45:1217-22. View abstract.  
Kahn RS, Westenberg HG. L-5-hydroxytryptophan in the treatment of anxiety disorders. J Affect Disord 1985;8:197-200. View abstract.  
Cangiano C, Ceci F, Cancino A, et al. Eating behavior and adherence to dietary prescriptions in obese adult subjects treated with 5-hydroxytryptophan. Am J Clin Nutr 1992;56:863-7. View abstract.  
Sarzi Puttini P, Caruso I. Primary fibromyalgia syndrome and 5-hydroxy-L-tryptophan: a 90-day open study. J Int Med Res 1992;20:182-9. View abstract.  
Nakajima T, Kudo Y, Kaneko Z. Clinical evaluation of 5-hydroxy-L-tryptophan as an antidepressant drug. Folia Psychiatr Neurol Jpn 1978;32:223-30. View abstract.  
Michelson D, Page SW, Casey R, et al. An eosinophilia-myalgia syndrome related disorder associated with exposure to L-5-hydroxytryptophan. J Rheumatol 1994;21:2261-5. View abstract.  
Birdsall TC. 5-Hydroxytryptophan: A Clinically-Effective Serotonin Precursor. Altern Med Rev 1998;3:271-80. View abstract.