

## Alternative and Complementary Treatments for Schizophrenia: List of References with Conclusions or Highlights

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**Abstract:** The references listed contain conclusions on natural treatments and alternatives that have been queried in a PubMed search of over 130,000 titles on schizophrenia and schizoaffective disorder. Most are complementary clinical trials with the alternative therapies used in conjunction with antipsychotic medication. However, this is not just a valuable resource for those currently using psychotropic drugs and wish to improve clinical outcome, it is a valuable resource for those seeking clinical efficacy of alternative treatments for schizophrenia that choose to not to use psychiatric drugs. This resource is also useful for those who are forced used psychiatric drugs, and are aware of iatrogenic harm and are interested in methods in reducing harm, or treating dyskinesia's, dystonia, akathisia, atypical antipsychotic-induced weight gain, mismatch negativity, dopaminergic supersensitivity, positive or negative symptoms and much more. These conditions may all be treated with by natural remedies and other alternatives methods. There are also neuroprotective treatments that can be found in current psychiatric and medical scientific literature, including treatment to reverse structural atrophy of the brain, and help reduce the oxidative damages of neuroleptic drugs. There are many natural treatments that improve the outcome of schizophrenia and that have been validated by scientific literature. Many will be listed in this document.

### Natural Treatments for Tardive Dyskinesia

**Lerner V.** Vitamin B6 treatment for tardive dyskinesia: a randomized, double-blind, placebo-controlled, crossover study. J Clin Psychiatry 2007 Nov;68(11):1648-54

- *"Vitamin B6 appears to be effective in reducing symptoms of TD."*

**Zhang WF.** Extract of ginko biloba treatment for tardive dyskinesia in schizophrenia: a randomized, double-blind, placebo-controlled trial. J Clin Psychiatry 2011 May;72(5):615-21

- *"EGb-761 appears to be an effective treatment for reducing the symptoms of TD in schizophrenia patient"*

**Miyaoka T.** Yi-gan san for the treatment of neuroleptic-induced tardive dyskinesia: an open-label study. Prog Neuropsychopharmacol Biol Psychiatry 2008 Apr 1; 32(3):781-4

- *"Administration of YGS resulted in a statistically significant improvement in tardive dyskinesia and psychotic symptoms"*

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**Barcelos R.** Effects of w-3 essential fatty acids (w-3 EFAs) on motor disorders and memory dysfunction typical neuroleptic-induced: Behavioral and biochemical parameter. *Neurotox Res*, 2009

- *"The FO (fish oil) decreased the motor disorders, memory dysfunction, and oxidative damage typical neuroleptic-induced"*

**Krishna Vaddadi,** Dyskinesia's and their treatment with essential fatty acids: a review. *Prostaglandins, Leukotrienes and Essential Fatty Acids* (1996) 55(1&2), 89-94

- *"Clinical improvement in HD (Huntington's Disease) with LA and GLA supplementation is a novel finding...." It has been suggested that in individuals at early stages of HD, or in individuals at risk of developing HD, if given EFA's probably of both n-6 and n-3 series on long term basis might delay the onset of HD."*

**Thaakur S,** Effect of alpha lipoic acid on the tardive dyskinesia and oxidative stress induced by haloperidol in rats. *J Neural Transm* (2009) 116;807-814

- *"In conclusion, ALA improves TD and catalepsy by scavenging hydroxyl radicals, singlet oxygen hypochlorous acid, and regenerating other antioxidants such as glutathione, vitamin C, ubiquinol (coenzyme Q 10) an indirectly vitamin E...."*

**Shamir E,** Melatonin treatment for tardive dyskinesia. *Arch Gen Psychiatry*. 2001;58:1049-1052

- *"In conclusion, the results of the present study demonstrate that melatonin treatment is beneficial for antipsychotic-induced TD."*

**Nikolaus M,** Severe tardive dyskinesia in affective disorders: Treatment with Vitamin E and C. *Neuropsychobiology* 2002;46(suppl 1):28-30

- *"...Combining vitamin E with C was a safe and efficacious in the treatment of tardive dyskinesia in affective disorder."*

**Bhattacharya S.** Effect of Embilica officinallis tannoids on a rat model of tardive dyskinesia. *Indian J of Experimental Biology*, Vol. 38, September 2000, pp. 945-947

- *"The results suggest that EOT exerts a prophylactic effect against neuroleptic-induced TD...."*

**Lee JG.** Clinical effectiveness of the Kampo medicine kamisoyosan for adjunctive treatment of tardive dyskinesia in patients with schizophrenia: a 16 week open trial. *Pyschiatry Clin Neurosci* 2007 Oct;61(5):509-14

- *"A meaningful reduction in total abnormal involuntary movement scale scores was observed in the tardive dyskinesia group"*

## Natural Treatment for Oral Dyskinesia's

**Naidu P.** Reversal of reserpine-induced orofacial dyskinesia and cognitive dysfunction by quercetin. *Pharmacology* 2004;70:59-67

- *"In conclusion, the results of the present study clearly indicated that quercetin has a protective role against reserpine-induced orofacial dyskinesia and associated cognitive dysfunction. Consequently, quercetin could be considered as a potential therapeutic agent for the treatment of TD."*

**Colpo G.** Ilex paraguariensis has antioxidant potential and attenuates Haloperidol-induced orofacial dyskinesia and memory dysfunction in rats. *Neurotoxicity Research*, 2007, Vol. 12(3), pp.171-180

- *"Rats treated with "mate" did not exhibit an increase in vacuous chewing movements observed in rats treated with haloperidol." The "mate" prevented the effects of haloperidol in this behavioral paradigm."*

**Naidu P.** Effect of Withania somnifera root extract on Haloperidol-induced orofacial dyskinesia: Possible mechanism of action. *Journal of Medicinal Food*, Vol. 6, No. 2, 2003

- *"These findings strongly suggest that oxidative stress plays a significant role in HP-induced orofacial dyskinesia and that Ws could be effective in preventing neuroleptic-induced extrapyramidal side effects."*

**Bishnoi M.** Protective effect of Curcumin, the active principle of turmeric (*Curcuma longa*) in haloperidol-induced orofacial dyskinesia and associated behavioral, biochemical and neurochemical changes in rat brain. *Pharmacol Biochem Behav.* 2008 Feb;88(4):511-22

- *"In present study, curcumin was able to reverse the behavioral, biochemical and neurochemical changes caused by exposure to haloperidol possibly by virtue of its antioxidant effect..."*

**Nade V. S.** Effect of Hibiscus rosa sinensis on reserpine-induced neurobehavioral and biochemical alterations in rats. *Indian Journal of Experimental Biology*, Vol. 47, July 2009, pp. 559-563

- *"The results from the presents study suggested Hibiscus rosa sinensis had a protective role against reserpine-induced orofacial dyskinesia and oxidative stress."*

**Naidu P.** Possible mechanism of action in melatonin attenuation of haloperidol-induced orofacial dyskinesia. *Pharmacology, Biochemistry and Behavior* 74(2003) 641-648

- *"In conclusion, melatonin could be screened as a potential drug candidate for the prevention or treatment of neuroleptic-induced orofacial dyskinesia"*

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**Bishnoi M.** Protective effect of rutin, a polyphenolic flavonoid against haloperidol-induced orofacial dyskinesia and associated behavioral, biochemical and neurochemical changes. *Fundamental and Clinical Pharmacology* 21(2007) 521-529

- *“The findings of the present study suggested the involvement of free radicals in the development of neuroleptic-induced orofacial dyskinesia, a putative model of TD, and rutin as a possible therapeutic option to treat this hyperkinetic movement disorder.”*

### Natural Treatments for Tardive Dystonia

**Dannon P.** Vitamin E treatment in tardive dystonia. *Clinical Neuropharmacology*. Vol. 20, No.5, pp. 434-437

- *“We present a case of one young man with tardive dystonia secondary to neuroleptic treatment, whose condition substantially improved with treatment by 1200mg/d(IU) of vitamin E.”*

**Tani M.** Effect of acupuncture treatment for a patient with severe axial dystonia appearing during treatment for schizophrenia. *Selshin Shinkeigaku Zasshi* 2005;107(8):802-10

- *“It is suggested that acupuncture treatment has had a positive effect on tardive dystonia including axial dystonia. The patient also achieved improved stability with regards to symptoms of schizophrenia.”*

### Natural Treatments for Extrapyramidal Side Effects

**Dorfman-Etrog P.** The effect of vitamin E addition to acute neuroleptic treatment on the emergence of extrapyramidal side effects in schizophrenic patients: An open label study. *European Neuropsychopharmacology* 9 (1999) 475-477

- *“Addition of vitamin E to neuroleptics may reduce the severity of acute neuroleptic-induced Parkinsonism (NIP) in schizophrenic patients.”*

**Miodownik C.** Vitamin B6 add-on therapy in treatment of schizophrenic patients with psychotic symptoms and movement disorders. *Harefuah* 2003 Sep;142(8-9):592-6, 647

- *The authors suggest that vitamin B6 may be efficient as a treatment for tardive dyskinesia and parkinsonism induced by neuroleptic agents.”*

### Natural Treatment of Tardive Oculogric Spasms

**Coupland N.** Successful treatment of tardive oculogric spasms with vitamin E. *Journal of Clinical Psychopharmacology*, Vol. 15(4), August 1995, pp 285-286

- *“The baseline frequencies of episodes accorded with his history and their number fell substantially within a month on vitamin E, 1200 IU daily.” “A trial of vitamin E seems merited in oculogric spasms that have not responded to standard approaches....”*

## Natural Treatments for Neuroleptic Malignant Syndrome

**Dursun SM.** High-dose vitamin E plus vitamin B6 treatment of risperidone-related neuroleptic malignant syndrome. *J Psychopharmacol* 1998;12(2):220-1  
PMID# 9694035

- *“This patient responded satisfactorily to the supportive management and vit E plus vit B6.”*

## Natural Treatments for Catalepsy

**Naidu P.S.** Quercetin, a bioflavonoid, reverses Haloperidol-induced catalepsy. *Methods Find Exp Clin Pharmacol* 2004, 26(5):323-326

- *“In conclusion, the findings of the present study strongly suggest that quercetin can be screened as a potential drug candidate or as an adjuvant for the treatment of neuroleptic-induced extrapyramidal side effects.”*

## Natural Treatments for Hypersalivation in Schizophrenia

**Hung CC.** Treatment effects of traditional Chinese medicines Suoquan Pill and Wuling Powder on clozapine-induced hypersalivation in patients with schizophrenia: study protocol of randomized, placebo-controlled trial. *Zhong Xi Yi Jie He Xue Bao* 2011 May;9(5):495-502

- *“It is hypothesized that SQP and WLP will have a beneficial effect in controlling clonzapine-induced hypersalivation symptoms.”*

## Prevention of Oxidative Stress Neuropathology in Schizophrenia

**Mahadik S. P.** Prevention of oxidative stress-mediated neuropathology and improved clinical outcome by adjunctive use of a combination of antioxidants and omega-3 fatty acids in schizophrenia. *International Review of Psychiatry*, April 2006: 18(2):119-131

- *“In summary, oxidative stress and cell damage likely exist at very early stages of schizophrenia and if not treated early, it can trigger progressive deterioration of neuropathology and thereby symptomology; dietary antioxidants and omega-3 fatty acids are found to effectively prevent and restore the oxidative neuropathology and improve the outcome under a variety of situations. Moreover, these supplements are also found to prevent and cure important medical morbidities such as obesity, hypertension, diabetes, and cardiovascular abnormalities that are often associated with illness and treatment.”*

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### Natural Improvement of Akathisia

**Lerner V.** Vitamin B6 treatment in acute neuroleptic-induced akathisia: a randomized, double-blind, placebo-controlled study. *J Clin Psychiatry* 2004 Nov;65(11):1550-4

- *“The vitamin B6-treated patients in comparison with the placebo group showed a significant on the subjective-awareness of restlessness, subjective distress, and global subscales of BAS. Our preliminary results indicate that high doses of vitamin B6 may be useful additions to the available treatments for NIA.....”*

**Berk M.** N-Acetyl Cysteine as glutathione precursor for Schizophrenia-A double-blind, randomized, placebo-controlled trial. *Biol Psychiatry* 2008;64:361-368

- *“A moderate benefit of NAC at end point for akathisia was also evident on the BAS, which approached significance.”*

**Kramer MS.** L-tryptophan in neuroleptic-induced akathisia. *Biol Psychiatry* 1990 Mar 15;27(6):671-2

- *“Akathisia scores decreased an average of 39% of base line. Some patients and referring physicians felt that L-tryptophan was quite helpful and requested its continuation.. L-tryptophan, along with nicotinic acid appeared to reduce both objective and subjective components of akathisia in most patients.”*

### Neuroprotection from Neuroleptics

**Post A.** Mechanisms underlying the protective potential of  $\alpha$ -Tocopherol (Vitamin E) against Haloperidol-associated neurotoxicity. *Neuropsychopharmacology*. 2002, Vol. 26, No. 3

- *“...the present study shows that pre- and co-treatment with vitamin E interferes with the stimulation of apoptotic cascades by haloperidol and, in addition, attenuates some of the undesirable behavioral side-effects of the neuroleptic.”*

**Heiser P.** Effects of antipsychotics and vitamin C on the formation of reactive oxygen species. *Journal of Psychopharmacology*, (2009) 1-6

- *“Vitamin C reduced the ROS production of all drugs tested and for haloperidol and clozapine the level of significance was reached. Our study demonstrated that induce the formation of ROS in whole blood of rats, which can be reduced by application of vitamin C.”*

**Dietrich-Muszalska A.** Inhibitory effects of polyphenol compounds on lipid peroxidation caused by antipsychotics (haloperidol and amisulpride) in human plasma in vitro. *The World Journal of Biological Psychiatry*, 2009, 1-6

- *“We showed that in the presence of polyphenols: resveratrol and quercetin, lipid peroxidation in plasma samples treated with tested drugs was significantly decreased.”*

## Reversal of Cerebral Atrophy in Schizophrenia

**Puri BK.** Eicosapentaenoic acid treatment in schizophrenia associated with symptom remission, normalization of blood fatty acids, reduced neuronal membrane phospholipid turnover and brain structure changes. *Int J Clin Pract* 2000; 54(1):57-63

- *“These results demonstrate that EPA can reverse both the phospholipid abnormalities previously described in schizophrenia and cerebral atrophy.”*

## Attenuation of Dopaminergic Supersensitivity

**Gattaz W. F.** Vitamin E attenuates the development of haloperidol-induced dopaminergic hypersensitivity in rats: possible implications for tardive dyskinesia. *J Neural Transm* (1993) 92: 197-201

- *“Within the context of the present experiment vitamin E attenuated the development of behavioral DA-supersensitivity after haloperidol treatment.”*

## Natural Reduction of Atypical Antipsychotic-Induced Weight Gain

**Eosu K.** A preliminary investigation of a-lipoic acid treatment of antipsychotic drug-induced weight gain in patients with schizophrenia. *J Clin Psychopharmacol* 2008;28:138-146

- *“The mean weight loss at the 12 week end point was 3.16 (3.20)kg; median, 3.03kg;range 0-8.85kg”*

**Yamamoto N.** Bofu-tsusho-san effectively attenuates the weight gain observed after receiving olanzapine. *Psychiatry Clin Neurosci* 2008 Dec;62(6):747

- *A 20 year old woman with schizophrenia on medication, experiencing weight gain, lost 2.7kg of weight in 6 months with additional use of Bofu-tsusho-san with no changes of food intake . “In study of obese mice, bofu-tsusho-san produced a significant decrease in fat mass and weight compared with placebo, with-out effecting amount of food ingested”*

## Natural Antipsychotics

**Elenbroek BA.** Effects of (-)stepholidine in animal models for schizophrenia. *Acta Pharmacol Sin* 2006 Sep;27(9):1111-8

- *“The data showed that SPD showed antipsychotic-like effects in both the prepulse inhibition paradigm and in the paw test. Moreover, the results of the paw test suggest that SPD has an atypical character with relatively small potency to induce extrapyramidal symptoms.”*

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**Feifel D.** Adjunctive intranasal oxytocin reduces symptoms in schizophrenic patients. *Biol Psychiatry* 2010;68:678-680

- *"We found that 3 weeks of intranasal oxytocin given adjunctive to standard antipsychotic medications, caused significantly greater reductions in schizophrenia symptoms at the end point compared with placebo. This result supports our hypothesis that oxytocin exhibits antipsychotic properties and validates preclinical studies, case reports, and less well controlled clinical studies suggesting oxytocin's ability to ameliorate symptoms of schizophrenia"*

**Samanta M. K.** Development of mono ingredient herbal neuroleptic tablet for better psychiatric therapy. *Indian J Pharm Sci*, 2005, 67(1):51-56

- *"A tablet containing A. calamus, W. somnifera, and G. glabra" "...three neuroleptic plant extracts were used for the formulation based on ayurvedic neuroleptic formulations and available literatures. ...It was found that these formulations containing three plant extracts were having similar effects as those of marketed formulations. The prepared tablet formulation has not shown any drug induced parkinsonian syndrome or any other relevant side effects, whereas the synthetic drug, chlorpromazine showed maximum pyramidal side effects."*

### Natural Improvement of Mismatch Negativity

**Lavoie S.** Glutathione precursor, N-Acetyl-Cysteine, Improves mismatch negativity in schizophrenic patients. *Neuropsychopharmacology*, 2008, 33, 2187-2199

*"MMN improvement was observed in the absence of robust changes in assessments of clinical severity, though the latter was observed in larger and more prolonged clinical study"*

### Natural Improvement of Negative Symptoms

**Lane H Y.** Sarcosine or D-Serine add-on treatment for acute exacerbation of schizophrenia. *Arch Gen Psychiatry*, 2005;62:1196-1204

*"The evidence most strongly supports the benefit of sarcosine for general psychiatric symptoms and depression and possible benefit for negative symptoms (blunted effect and alogia) but not for positive symptoms during acute phase."*

**Doruk A.** A placebo-controlled study of extract of ginkgo biloba added to clozapine in patients with treatment-resistant schizophrenia. *Int Clin Psychopharmacol* 2008 Jul;23(4):223-7

*"These preliminary data suggested that EGb was found useful for enhancing the effect of clozapine on negative symptoms in patients with treatment resistant schizophrenia"*

**Heresco-Levy U.** High-dose glycine added to olanzapine and risperidone for the treatment of schizophrenia. *Biol Psychiatry* 2004 Jan 15;55(2):165-71

*"The negative symptoms improvement remained significant even following covariation for changes in other symptom clusters and extrapyramidal side effects."*

## Natural Symptom Reduction and Improved Clinical Outcome

**Dakhale G.N.** Supplementation of vitamin C with atypical antipsychotics reduces oxidative stress and improves the outcome of schizophrenia. *Psychopharmacology* (2005) 182:494-498

- *“BPRS change scores at 8 weeks improved statically significant with vitamin C as compared to placebo.”*

**Berk M.** N-Acetyl-Cysteine as a glutathione precursor for schizophrenia-a double blind, randomized, placebo-controlled trial. *Biol Psychiatry* 2008;64:361-368

- *“Improvement was seen on the CGI-I at 2 weeks and the CGI-S at 4 weeks, while improvement on the PANSS and a trend for improvement on the BAS emerged only toward 24 weeks of treatment.”*

**Arvindakshan M.** Supplementation with a combination of w-3 fatty acids and antioxidants (vitamin E and C) improves the outcome of schizophrenia. *Schizophrenia Res* 62 (2003) 195-204

- *“Concomitantly, there was significant reduction in psychopathology based on reduction in individual total scores for brief psychiatric rating scale (BPRS) and positive and negative syndrome scale (PANSS), general psychopathology-PANSS and increase in Henrich’s Quality of Life (QOL) scale.”*

**Lane HY.** A randomized, double –blind, placebo-controlled comparison study of sacosine (N-methylglycine) and D-serine add-on treatment for schizophrenia. *Int J Neuropsychopharmacolgy* 2010 May; 13(4):451-60

- *“Treatment group x treatment duration interaction analysis by multiple linear regression showed that sacosine was superior to placebo at all four outcome measures of Positive and Negative Syndrome Scale (PANSS)...., Scale for the Assessment of Negative Symptoms (SANS), Quality of Life (QOL) and Global Assessment of Functioning (GAF). However, d-serine did not differ in effect significantly from placebo in any measure.”*

**Heresco-Levy U.** D-serine efficiency as add-on pharmacotherapy to risperidone and olanzapine for treatment-refractory schizophrenia. *Biol Psychiatry* 2005 Mar 15;57(6):577-85

- *“D-serine administration induced increased serine serum levels and resulted in significant improvements in negative, positive, cognitive, and depression symptoms, as measured by the Positive and Negative Syndrome Scale.”*

## Natural Reduction of Positive Symptoms

**Atmaca M.** The effect of extract of ginko biloba addition to olanzapine on therapeutic effect and antioxidant enzyme levels in patients with schizophrenia. *Psychiatry and Clinical Neurosciences* (2005),59. 652-656

- *“At the evaluation of week 8, a significant difference in mean Scale for the Assessment of Positive Symptoms (SAPS) scores but not in Scale for the Assessment of Negative Symptoms between groups was found.”*

## Alternative and Complementary Treatments for Schizophrenia

**Laan W.** Adjuvant aspirin therapy reduces symptoms of schizophrenia spectrum disorders: results from a randomized, double-blind, placebo-controlled trial. *J Clin Psychiatry* 2010 May;71(5):520-7

- *“Aspirin given as adjunctive therapy to regular antipsychotic treatment reduces the symptoms of schizophrenia spectrum disorders.”*

### Natural Attenuation of Amphetamine Induced Positive Psychotic Symptoms

**Irwin MR.** L-5-hydroxytryptophan attenuates positive psychotic symptoms induced by D-amphetamine. *Psychiatric Res* 1987 Dec;22(4):283-9

- *“Pre-administration with 5HTP significantly antagonized amphetamine-elicited elevations in thought disturbance, activation, and hallucinations.”*

### Natural Therapies for Treatment Resistant Schizophrenia

**Miyaoka T.** Yi-gan san as adjunctive therapy for treatment-resistant schizophrenia: an open-label study. *Clin Neuropharmacol* 2009 Jan-Feb;32(1):6-9

- *“A significant decrease was observed at 2 weeks and at 4 weeks in each Positive and Negative Syndrome Scale for Schizophrenia subscale score in the YGS group, but not observed in the control group.”*

**Bulut M.** Beneficial effects of N-acetylcysteine in treatment resistant schizophrenia. *World J Biol Psychiatry* 2009;10(4 Pt 2):626-8

- *“This paper reports a case of a poorly responsive schizophrenia patient who improved considerably with add-on NAC 600 mg/day.”*

### Sound Therapy for Remission of Auditory Hallucinations in Treatment Resistant Schizophrenia

**Kaneko Y.** Two cases of intractable auditory hallucination successfully treated with sound therapy. *International Tinnitus Journal* 2010;16(1):29-31

- *“We report two cases of AVHs successfully treated with sound therapy safely using a tinnitus control instrument (sound generator). The present study showed that sound therapy induced a complete remission of AVHs safely in two patients 2 years 7 months and 1 year 6 months. These results imply that the neuromechanism of AVHs is sensitive to sound therapy.”*

### Dietary Modification for Symptom Remission in Schizophrenia

**Dohan FC.** Relapsed schizophrenics: more rapid improvement on a milk-and cereal free diet. *Br J Psychiatry* 1969 May; 115(522):595-6

- N/A

**Dohan FC.** Relapsed schizophrenics: Earlier discharged from the hospital after cereal-free, milk-free diet. *Am J Psychiatry* 130;6, June 1973

- *“During the first 90 days after admission to the hospital, those schizophrenics assigned to the CFMF diet were discharged more than twice as fast as those in the HC (high cereal) control group. In contrast to the beneficial effects of the CFMF diet, the relapsed schizophrenics on the CFMF diet to which wheat gluten was added (without the knowledge of staff or patients) were not discharged from hospital significantly faster than their temporal controls on the HC diet.”*

**De Santis A.** Schizophrenic symptoms and SPECT abnormalities in a coeliac patient: regression after a gluten-free diet. *J Internal Medicine* 1997;242:421-423

- *“A 33 year-old patient, with pre-existing diagnosis of ‘schizophrenic’ disorder, came to our observation for severe diarrhea and weight loss. Use of SPECT, demonstrated hypoperfusion of the left frontal brain area, without evidence of structural cerebral abnormalities. Jejunal biopsy showed villous atrophy. Antiendomysial antibodies were present. A gluten-free diet was started, resulting in disappearance of psychiatric symptoms, and normalization of histological duodenal findings and of the SPECT pattern....the SPECT demonstrating a dysfunction of the frontal cortex disappearing after a gluten free diet.”*

**Cade R.** Autism and Schizophrenia: Intestinal Disorders Nutritional Neuroscience, Vol. 3, pp. 52-72, 2000

- *“...with a gluten-casein free diet alone. Patients 1 and 6 showed significant improvement after only two months on the diet. After four months on the diet, all seven patients had improved and there was a statistically significant improvement for the group as a whole comparing control with experimental values.”*

**Kraft BD.** Schizophrenia, gluten and low-carbohydrate, ketogenic diets. *Nutr Metab (Lond)* 2009 Feb 26;6:10

- *A case report of a 70 year old schizophrenic with severe medical problems who used a ketogenic diet. “Over the course of 12 months, C.D. has continued the low-carbohydrate, ketogenic diet and has had no recurrence of auditory or visual hallucinations. She has also continued to lose weight and experience improvements in her energy level. She acknowledged having 2-3 isolated episodes of dietary non-compliance that lasted several days, where she ate pasta, bread, and cakes around the holidays: however she had no recurrence of her hallucinations.*

**Pacheco A.** A pilot study of the ketogenic diet in schizophrenia. *Am J Psychiatry* 121, May 1965, pp. 1110-1

- *“The average scores showed a statistically significant decrease in symptomology after 2 weeks on the ketogenic diet. The third rating taken one week after discontinuing the diet, showed that in 7 out of 10 patients there was a slight to fairly large increase in symptomology.”*

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### Natural Treatment for Hyperprolactinemia in Schizophrenia

**Yuan HN.** A randomized, crossover comparison of herbal medicine and brocriptine against risperidone-induced hyperprolactinemia in patients with schizophrenia. *J Clin Psychopharmacol* 2008 Jun;28(3):264-370

- *“Peony-Glycyrrhiza Decoction treatment produced a significant baseline-endpoint decrease in serum PRL levels, without exacerbating psychosis and changing other hormones, and decreased the amplitudes were similar to those of BMT (24% vs 21%-38%).”*

### Chinese Medical Treatment to Invigorate Blood and Relieve Stasis in Schizophrenia

**Wang B.** Traditional Chinese medical treatment to invigorate blood and relieve stasis treatment of schizophrenia: comparison with antipsychotic treatment. *Psychiatry Clin Neurosci* 1996 Dec;52 Suppl:S329-30

- *“Traditional Chinese medicine is superior to antipsychotic drugs in the effects of anti-anxiety-depression and antipsychomotor inhibition, but is less effective in controlling psychomotor excitation compared with antipsychotic drugs”*

### Natural Treatment for Insomnia in Schizophrenia

**Suresh Kumar PN.** Melatonin in schizophrenic outpatients with insomnia: a double-blind, placebo-controlled study. *J Clin Psychiatry* 2007 Feb;88(2):237-41

- *“The modal stable dose of melatonin was 3mg. Relative to placebo, melatonin significantly improved the quality and depth of sleep of nighttime sleep, reduced the number of nighttime awaking's, and increased the duration of sleep without producing a morning hangover. Subjectively, melatonin also reduced sleep-onset latency, heightened freshness on awaking, improved mood, and improved daytime functioning.”*

### Natural Treatment for Anxiety in Schizophrenia

**Ritsner MS.** L-theanine relieves positive, activation, and anxiety symptoms in patients with schizophrenia and schizoaffective disorder: and 8 week, randomized, double-blind, placebo-controlled, 2-center study. *J Clin Psychiatry* 2011 Jan;72(1):34-42

- *“According to the 5-dimension model of psychopathology, L-theanine produced significant reductions on PANSS positive and activation factor scores compared to placebo.”*

### Virtual Reality for Treatment of Schizophrenia

**De Costa RM.** The acceptance of virtual reality devices for cognitive rehabilitation: a report of positive results with schizophrenia. *Comput Methods Programs Biomed* 2004 Mar;73(3):173-82

- *“The subjects that participated in this experiment accepted to work with computers and immersive glasses and demonstrated a high level of interest in the proposed tasks. No problems of illness have been observed.”*

## Bright Light Therapy for Schizophrenia

**Aichhorn W.** Bright light therapy for negative symptoms in schizophrenia: a pilot study. J Clin Psychiatry 2007 Jul;68(7):1146

- *“Bright light therapy was safe in our patients and did not result in psychotic exacerbation, as seen in unchanged positive scores on the PANSS. The subjective improvement in drive was statistically significant after 4 weeks, but did not persist after discontinuation of bright light therapy.”*

**Heim M.** Bright light therapy in schizophrenic diseases. Psychiatr Neurol Med Psychol (Leipz) 1990 Mar;42(3):146-50

- *“20 patients with schizophrenic disorders, displaying a depressive syndrome, were given bright-light therapy, and compared with 11 patients treated by means of partial deprivation of sleep. Against a figure of 27% in the case of sleep-deprivation, syndrome remittance was 55% in the case of bright-light therapy. As depressive syndromes improve under bright-light therapy, schizophrenic syndromes also recede, which suggests close syndromatologic links....”*

**Oren D.** Bright Light Therapy for Schizoaffective Disorder. Am J Psychiatry 158:12, December 2001

- *“Bright light therapy proved comparable or superior to treatment with previous medications for depression for this patient.”*

## Hyperbaric Oxygen Treatment for Schizophrenia

**Kutko II.** The use of hyperbaric oxygenation in treating mental patients resistant to psychopharmacotherapy. Zh Nervol Psikhaitr Im S S Korsakova 1996;96(5):47-51

- *“A positive clinical effect was marked in 72.5% of cases (in 67.4% of schizophrenic patients and in 77.4% of patients with vascular disease).”*

**Isakov IuV.** Clinical effectiveness of hyperbaric oxygenation in the combined treatment of patients with schizophrenia. Zh Nevropatol Psikhiatr Im S S Korsakova 1987;87(12):1832-5

- *“The maximum therapeutic effect was observed after 10-12 sessions”*

## CPAP for Negative Symptoms and Remission of Auditory Hallucination in Schizophrenia

**Sugishita K.** Continuous positive airway pressure for obstructive sleep apnea improved negative symptoms in patient with schizophrenia. Psychiatry and Clinical Neurosciences 2010;64:663-667

- *“The present case report is in line with previous reports, including a patient with delusional schizophrenia showing improvement of negative symptoms and a case of hebephrenic schizophrenia showing complete remission of auditory hallucinations after successful treatments of OSA with CPAP.”*

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### Biofeedback for Schizophrenia

**Pharr OM.** The use and utility of EMG biofeedback with chronic schizophrenic patients. *Biofeedback Self Regul* 1989 Sept;14(3):229-45

- *“On the nurses observation scale for inpatient evaluation the biofeedback group significantly improved on the Social Competence and Social Interest factors”*

**Schneider SJ.** Neuroleptic-like electroencephalographic changes in schizophrenics through biofeedback. *Biofeedback Self Reg* 1982 Dec;7(4):479-90

- *“The results suggest that the EEG of schizophrenics can be temporarily altered, using feedback techniques, in a way that mimics the EEG changes that have been shown to occur with neuroleptic induced clinical improvement*

### Biofeedback for the Treatment of Polydipsia in Schizophrenia

**Walter G.** A “biofeedback” approach to the treatment of chronic polydipsia. *J Behv Ther Exp Psychiatry* 1993 Sep;24(3):225-9

- *“The patient showed substantially increased sodium concentration, which was maintained despite the withdrawal of feedback. This behavioral method appears promising in settings where restriction of fluid intake is not practical or ethical.”*

### Acupuncture for Schizophrenia

**Lee MS.** Acupuncture for schizophrenia: a systematic review and meta-analysis. *Int J Clin Pract* 2009 Nov;63(11):1622-33

- *“Thirteen RTC’s, all originating from China, met the inclusion criteria. One RTC reported significant effects of electro-acupuncture plus drug therapy for improving auditory hallucinations and positive symptoms compared to sham EA plus drug therapy. Four RTCs showed significant effects of acupuncture for response rate compared with antipsychotic drugs. Seven RTCs showed significant effects of acupuncture plus antipsychotic therapy for response rate compared with antipsychotic drug therapy. Two RTCs tested laser acupuncture on hallucinations against sham laser acupuncture. One RTC found beneficial effects of laser acupuncture on response rate, Brief Psychiatric Rating Scale and clinical global index compared with sham laser.”*

### Electroacupuncture for treatment of Schizophrenia

**Jing Cheng.** Electro-acupuncture versus sham electro-acupuncture for auditory hallucinations in patients with schizophrenia: a randomized controlled trial. *Clin Rehabil* 2009 Jul;(7):579-88

- *“The clinical response rates in electro-acupuncture and sham electro-acupuncture group were 43.3% and 13.3% respectively.”*

**Feng-Ju Y.** Short-term curative effect of electroacupuncture as adjunctive treatment on schizophrenia. *Zhongguo Zhong Xi Yi Zhi* 2006 Mar;26(3):253-5

- *“With effect equal to CZ (clonzapine), combination of CZ and EA shows higher compliance in treating schizophrenia....”*

**Zhuge DY .** Comparison between electro-acupuncture with chlorpromazine and chlorpromazine alone in 60 schizophrenic patients. *Zhongguo Zhong Xi Yi Jie He Za Zhi* 1993 Jul;13(7):408-9,388

- *“The result showed the total curative effects of the two groups were similar. However, the marked effects appeared earlier in combined therapy than using chlorpromazine alone, less chlorpromazine was needed.”*

## **Ayurvedic Medicine for Schizophrenia**

**Agarwal V.** Ayurvedic medicine for schizophrenia. *Cochrane Database Syst Rev* 2007 Oct 17;(4):CD006867

- *“....Ayurvedic treatment, in the case a complex mixture of many herbs, is compared with chlorpromazine in acutely ill people with schizophrenia, it is equally, but skewed data seems to favor the chlorpromazine group. Ayurvedic medication may have some effects for treatment of schizophrenia....”*

## **Shiatsu Therapy for Schizophrenia**

**Lichtenberg P.** Shiatsu as an adjunctive therapy for schizophrenia: an open-label pilot study. *Altern Ther Health Med* 2009 Sep-Oct;15(5):44-6

- *“On the scales of psychopathology and side effects, the subjects showed a statistically and clinically significant improvement by the end of treatment. This improvement was maintained at the 12 week follow-up.”*

## **Hypnosis for Schizophrenia**

**Izquierdo de S.** Hypnosis for Schizophrenia. *Cochrane Database Syst Rev.* 2007 Oct;17(4):CD004160

- *“Hypnosis could be helpful for people with schizophrenia”*

## **Yoga for better clinical outcome in Schizophrenia**

**Vancampfort D.** State anxiety, psychological stress and positive well-being responses to yoga and aerobic exercise in people with schizophrenia: a pilot study. *Disabil Rehabil* 2011;33(8):684-9

- *“After single sessions of yoga and aerobic exercises individuals with schizophrenia or schizoaffective disorder showed significantly decreased state anxiety, decreased psychological stress and increased subjective well-being compared to no exercise control.”*

## Alternative and Complementary Treatments for Schizophrenia

**Visceglia E.** Yoga therapy as an adjunctive treatment for schizophrenia: a randomized, controlled pilot study. *J Altern Complement Med* 2011 Jul;17(7):601-7

- *“The YT group obtained significant improvements in positive and negative symptoms of schizophrenia symptoms compared to WL, including PANSS scores on positive syndrome, negative syndrome, general psychopathology. Activation, paranoia, and depression subscales. YT had improved perceived quality of life in physical and psychological domains.”*

**Duraiswamy G.** Yoga therapy as an add-on treatment in the management of patients with schizophrenia—a randomized controlled trial. *Acta Psychiatr Scand* 2007 Sep;116(3):226-32

- *“Subjects in the YT group had significantly less psychopathology than those in the PT group at the end of four months”*

### Mindfulness for Schizophrenia

**Chadwick P.** Mindfulness groups for distressing voices and paranoia: a replication and randomized feasibility trial. *Behav Cogn Psychother* 2009 Jul;37(4):403-12

- *“Secondary analysis combining both groups and comparing scores before and after mindfulness training revealed significant improvement in clinical functioning and mindfulness of distressing thoughts and images.”*

**Newman TK.** Impact of mindfulness on cognition and effect in voice hearing: evidence from two case studies. *Behav Cogn Psychother* 2009 Jul;(4):397-402

- *“Findings show that mindfulness training has an impact on cognition and affect specifically associated with voices, and thereby beneficially alters relationship with voices.”*

### Physically Oriented Therapy for Schizophrenia

**Rohricht F.** Ego-pathology, body experience, and body psychotherapy in chronic schizophrenia. *Psychol Psychother* 2009 Mar;82(Pt 1):19-30

- *“In patients with chronic schizophrenia, body oriented psychological interventions may be effective for both positive therapeutic changes in ego-pathology and negative symptoms...”*

**Andres K.** Empirical study of a physically oriented therapy with schizophrenic patients. *Z Klin Psychol Psychopathol Psychother* 1993;41(2):159-69

- *“The study shows that this body-oriented therapy is a worthy consideration as a method for giving schizophrenic patients a greater awareness of their own body limits”*

## Music Therapy for Schizophrenia

**Na HJ.** Effects of listening to music on auditory hallucinations and psychiatric symptoms in people with schizophrenia. *J Korean Acad Nurs* 2009 Feb;39(1):62-71

- *"...listening to music may be useful for managing auditory hallucinations in schizophrenic inpatients.*

## Art Therapy for Schizophrenia

**Tegibaerg HS.** Art therapy may reduce psychopathology in schizophrenia by strengthening the patients sense of self: a quantitative extended case report. *Psychopathology* 2011;44(5):314-8

- *"The most important benefit of the art therapy was a strengthening of the patients' sense of self. All patients reported a good outcome, and qualitative analysis showed that the positive effect of art therapy is mainly due to a strengthening of patients' minimal sense of self."*

**Ruddy R.** Art therapy for schizophrenia or schizophrenia-like illnesses. *Cochrane Database Syst Rev* 2005 Oct 19;(4):CD003728

- *"Data from one mental state measure (SANS) showed a small but significant difference favoring the art-therapy group. ....a measure of social functioning (SFS) showed no clear difference between groups in endpoint scores and in quality of life, as measured by PerQoI, did not indicate the effects of art therapy."*

## Effect of Humorous Movies on Schizophrenics

**Gelkopf M.** The effect of humorous movies on inpatients with chronic schizophrenia. *J Nerv Ment Dis* 2006 Nov;194(11):880-3

- *"Reduced levels of psychopathology, anger, anxiety, and depression symptoms and improvement in social competence were reveled in the study group.*

## Progressive Muscle Relaxation for Schizophrenia

**Chen WC .** Efficiency of progressive muscle relaxation training in reducing anxiety in patients with acute schizophrenia. *J Clin Nurs* 2009 Aug;18(15):2187-96

- *"This study demonstrated that progressive muscle relaxation can effectively alleviate anxiety in patients with schizophrenia"*

**Vancampfort D.** Effects of progressive muscle relaxation on state anxiety and subjective well-being in people with schizophrenia. *Clin Rehabil* 2011 Jun;25(6):587-75

- *"Progressive muscle relaxation is highly effective in reducing acute feelings of stress and anxiety in patients with schizophrenia."*

## Alternative and Complementary Treatments for Schizophrenia

### Dance Movement Therapy for Schizophrenia

**Xia J.** Dance therapy for schizophrenia. Cochrane Database Syst Rev 2009 Jan 21;(1):CD006868

- *“At the end of treatment significantly more people in dance therapy group had a greater than 20% reduction in PANSS negative symptom score, and overall average endpoint scores were lower. There is no evidence to support or refute the use of dance therapy in this group of people”*

### Exercise Therapy for Schizophrenia

**Gorczynski P.** Exercise therapy for schizophrenia. Cochrane Database Syst Rev 2010 May 12;(5):CD004412

- *“.....results indicated that regular exercise programs are possible in this population, and that they can have healthful effects on both the physical and mental health and well-being of individuals with schizophrenia”*

### Dark Therapy for Schizoaffective Disorder

**German Gomez-Bernal.** Dark therapy for schizoaffective disorder: A case report. Med Hypotheses Volume 72, Issue 1, pp. 105-6, January 2009

- *“James Phelps describes how amber-tinted safety glasses, could be useful for patients with rapid cycling bipolar disorder. These lens could block more than 90% wavelengths around 450nm (blue to blue-green) of light spectrum creating “virtual darkness” which could has a physiologic effect equivalent to true darkness, at least at the level of melatonin synthesis. I report a case that could support Phelps hypotheses.”*

### Update to Neuro-Protection From Neuroleptics

**Bishnoi M.** Protective effect of curcumin and its combination with piperine (bioavailability enhancer) against haloperidol-associated neurotoxicity: cellular and neurochemical evidence. Neurotox Res 2011 Oct;20(3):215-25

- *“Interestingly, co-administration of curcumin (25 and 50mg/kg, i.p., 21 days) dose dependently prevented all behavioral, cellular, and neurochemical changes associated with administration of haloperidol.”*