

Depression

Dr. John Bergman

Depression

- A state of low mood and aversion to activity that can affect a person's thoughts, behavior, feelings and sense of well-being



History of Depression

- Ancient Greece, disease was thought due to an imbalance in the four basic bodily fluids, or *humors*.
 - Ancient Greek *melas*, "black", and *kholé*, "bile", melancholia
- Hippocrates: "fears and despondencies, if they last a long time" as being symptomatic of the ailment"
- 17th century Robert Burton's book, *The Anatomy of Melancholy*
- melancholy helped by, a healthy diet, sufficient sleep, music, and "meaningful work", along with talking about the problem with a friend
- 1950 depression - **chemical imbalance** in neurotransmitters in the brain
- 1960s and 70s, manic-depression or bipolar disorder
- 1965- Joseph Schildkraut develop the **Serotonin hypothesis**
- 1980 *Major depressive disorder* was added to DSM-III in 1980

Depressive Mood Disorders

- Major Depressive Disorder (Clinical Depression)
- Bipolar disorder
- Anxiety Disorder
- Dysthymia
- Seasonal Affective disorder
- Borderline Personality Disorder
- Posttraumatic Stress Disorder
- Atypical Depression
- Melancholic depression
- Psychotic Major depression
- Catatonic Depression
- Postpartum Depression



Depression Statistics

- **350 million** people worldwide who suffer from depression
- Depression affects **16 million** Americans
- **1 in 20** Americans are depressed
- Estimated that **50% of Americans have major depression**
- Women are **70%** more likely to be depressed than men
- **20-26%** percent of all women will be diagnosed with major depression
- **1 in 33** children and **1 in 8** adolescents have clinical depression
- **Major Depressive Disorder** is the leading cause of disability in the U.S.
- Estimated annual cost of depression in the U.S: **\$80 billion**
- Depression accounts for **\$12 billion** in lost workdays each year
- Decreased productivity caused by depression costs **\$11 billion** per year

Depression and Suicide

- **Depression causes two-thirds of all suicides in the U.S.**
- For every 2 homicides there are 3 suicides
- Suicide is the leading cause of death among 15 to 24 year olds
- Suicide is the fourth leading cause of death among 10-14 year olds
- Young males ages 15-



at risk for suicide

Depression Occurring with illnesses

- 25% of cancer patients
- 27% of post-stroke patients
- 1 in 3 heart attack survivors
- 1 in 3 HIV patients
- 50% of Parkinson's disease patients
- 75% of eating disorder patients
- 27% of patients with substance abuse disorders
- 27% of people with diabetes



Symptoms of Depression

A depressed person can feel:

- Sad
- Anxious
- Empty
- Hopeless
- Helpless
- Worthless
- Guilty
- Irritable
- Ashamed
- restless

Effects of Depression

- Loss of interest in pleasurable activities
- Loss of appetite and weight loss
- Overeating and weight gain
- insomnia or oversleeping
- Fatigue
- Chronic pain
- Difficulty concentrating
- Memory loss
- Suicidal thoughts
- 4 times more likely to develop a heart attack

The Cause of Depression

The Biopsychosocial Model

- Depression is caused by a combination of biological, psychological, and social factors



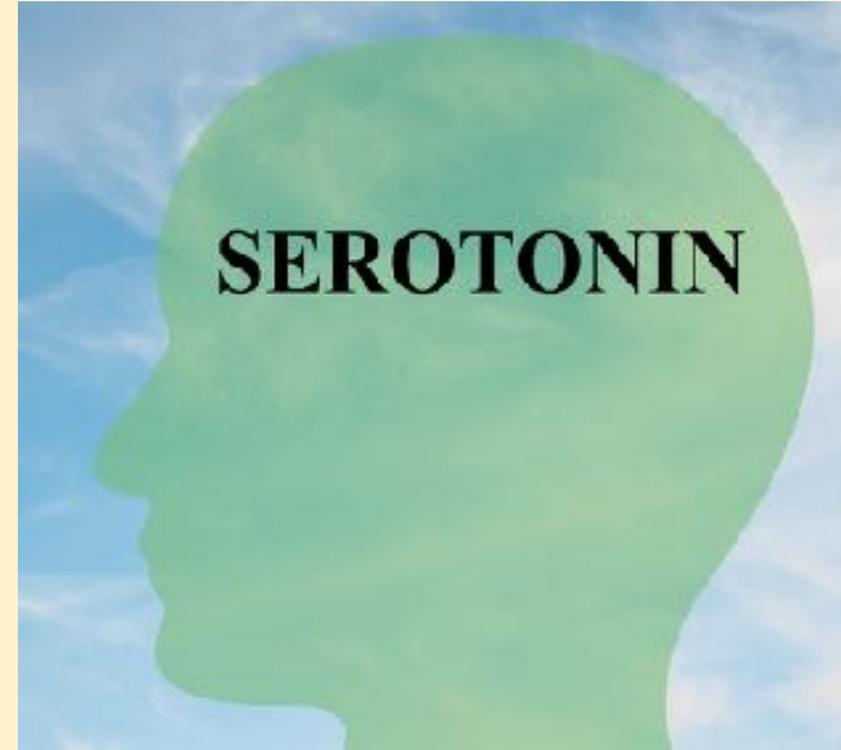
Psychological and Social Factors for Depression

- Bereavement
- Neglect
- Mental abuse
- Sexual abuse
- Childbirth
- Menopause
- Financial difficulties
- Job problems
- A medical diagnosis
- Bullying
- Social isolation
- Relationship troubles
- Catastrophic injury



Biological Factors

- Genetic Factors
- Circadian Rhythm
- The Monoamine Hypothesis



Genetic Factors

- 2003- Study that found a gene-environment interaction depending on an allelic variation of the serotonin-transporter-linked promoter region
- 2007- 11 replications of this study
and the largest studies were **Negative**
- 2009- 20 replicative studies are all **Negative**



The Largest Mega-Analysis of Genome-Wide association for Major Depressive Disorder

- involving the genetic analysis of over **127,000 people**

“Prior genome-wide association studies (GWAS) of major depressive disorder (MDD) have met with limited success.”

“Although this is the largest genome-wide analysis of MDD yet conducted, its high prevalence means that the sample is still underpowered to detect genetic effects typical for complex traits. Therefore, **we were unable to identify robust and replicable findings.**”

(Journal of Molecular Psychiatry, 2013)

Circadian Rhythm

- Depression may be related to abnormalities in the circadian rhythm
- REM (Rapid Eye Movement) sleep requires decreased serotonin levels

Light

- Is the primary cue for the Circadian Rhythm
- Light deprivation is related to decreased activity in the serotonergic system and abnormalities in the sleep cycle
- Light therapy targets the serotonergic system and has a regulatory effect on serotonin levels.
- Light therapy can be used to treat sleep disorders and depressive disorders

The Monoamine Hypothesis of Depression (The Serotonin Hypothesis)

Monoamines are neurotransmitters including:

- Serotonin: feelings of well-being and happiness
- Dopamine: reward-motivated behavior and pleasure
- Epinephrine (Adrenaline): response to stress and fear
- Norepinephrine (noradrenaline): response to stress (fight or flight)

The Hypothesis

- The deficit of certain neurotransmitters is responsible for depression
“Serotonin may help to regulate other neurotransmitter systems and decreased serotonin activity may permit these systems to act in unusual and erratic ways”

(Archives of General Psychiatry)

Antidepressant Medication



- Selective Serotonin Reuptake Inhibitors (SSRIs)
- Monoamine Oxidase Inhibitors (MAOIs)
- Direct-to-consumer advertising (DTCA) campaigns have largely revolved around the **claim** that SSRIs correct a “**chemical imbalance**” caused by lack of serotonin.
- **SSRIs are now among the best-selling drugs in medical practice**
- The FDA monitors the advertisements once they are in print or on the air
- Misleading content is frequently found in various DTCA campaigns

Pharmaceutical Advertisements

“**Celex** helps to restore the brain’s chemical balance by increasing the supply of a **chemical messenger** in the brain called serotonin.”

“When you’re clinically depressed, one thing that can happen is the **level of serotonin** (a chemical in your body) may drop. To help bring serotonin levels closer to normal, the medicine doctors now prescribe most often is **Prozac**.”



Pharmaceutical Advertisements

“Chronic anxiety can be overwhelming. But it can also be overcome...

Paxil, the most prescribed medication of its kind for generalized anxiety, works to correct the **chemical imbalance** believed to cause the disorder.”

“While the cause is unknown, depression may be related to an **imbalance of natural chemicals** between nerve cells in the brain.

Prescription **Zoloft** works to correct this imbalance. You just shouldn't have to feel this way



The Business of Depression

- The Psychiatric industry is a **\$330 Billion industry**
 - Antidepressants are the most consumed class of drugs in the U.S.
 - Averaging about **270 million prescriptions per year**
 - The U.S. antidepressant market peaked at **\$12 billion in 2008**
- Antidepressant use in the US among ages 12 and older increased by **400%** between 1994-2008
 - **1 in 10 Americans** is taking an Antidepressant
 - **1 in 4** among women aged 50 to 64 are taking Antidepressants

Effects of Antidepressants

- Increased risk of developing mania or bipolar disorder
- If taken during pregnancy: **87% increased risk of autism**
- May double your risk of bone fractures
- 30% increased risk of spinal fractures
- **45% more likely to suffer a fatal stroke**
- 32% increased risk of heart disease
- 2-3 times increased risk of diabetes
- **Doubles your risk of suicide**
- Linked to violent behavior, murder, suicide and more

Problems with the Monoamine Hypothesis

The American Psychiatric Press Textbook of Clinical Psychiatry

- Addresses serotonin deficiency as an **unconfirmed hypothesis**, stating, “Additional experience has not confirmed the monoamine depletion hypothesis”

“The hypothesis has enjoyed considerable support, since it attempts to provide a pathophysiologic explanation of the actions of antidepressants. However, in its original form it is **clearly inadequate**, as it does not provide a complete explanation for the actions of antidepressants, and the **pathophysiology of depression itself remains unknown.**”

(Journal of Clinical Psychiatry)

Problems with the Monoamine Hypothesis

“A serotonin deficiency for depression has not been found”

Psychiatrist Joseph Glenmullen, Harvard Medical School

“So far, there is no clear and convincing evidence that monoamine deficiency accounts for depression, that is, there is no “real” monoamine deficit”

Psychiatrist Stephen M. Stahl (Essential Psychopharmacology, 2000)

“Given the ubiquity of a neurotransmitter such as serotonin and the multiplicity of its function, it is almost as meaningless to implicate it in depression as it is to implicate blood”

Science writer John Horgan (The Undiscovered Mind, 1998)

Problems with the Monoamine Hypothesis

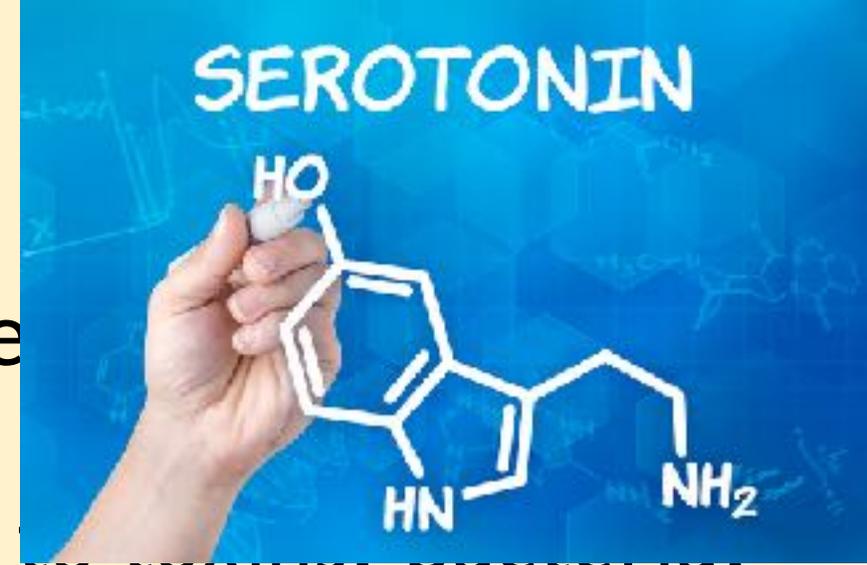
“I spent the first several years of my career doing full-time research on brain serotonin metabolism, but never saw any convincing evidence that any psychiatric disorder, including depression, results from a deficiency of brain serotonin. **In fact, we cannot measure brain serotonin levels in living human beings so there is no way to test this theory.** Some neuroscientists would question whether the theory is even viable, since the brain does not function in this way, as a hydraulic system.”

Stanford Psychiatrist David Burns

Winner of the A.E. Bennett Award given by the Society for Biological Psychiatry, for his research on Serotonin Metabolism

Serotonin

- Biochemically derived from tryptophan
- 90% of the body's total serotonin is located in enterochromaffin cells in the GI tract
- Enterochromaffin cells are very sensitive to toxins, bacteria, viruses and especially sensitive to irradiation and cancer chemotherapy



“Little is known about the specific contribution of serotonin to the neurobiology of emotion and mood in healthy people.”

(Journal of Psychiatry and Neuroscience)

Functions of Serotonin

- Regulates intestinal movements
- Regulates mood, appetite, and sleep
- Plays a role in cognitive function including memory and learning
- Serves as a vasoconstrictor and helps regulate homeostasis and blood clotting
- Is a growth factor for certain types of cell and may have a role in wound healing
- Regulates bone mass
- Affects organ development
- Regulates Cardiovascular growth factor
- It is thought to be a contributor to feelings of well-being and happiness

The Hippocampus and Depression

- Involved in behavioral reactions and mood disorders
- Shrinkage and atrophy of the Hippocampus are associated with Depression

Contributing factors to Hippocampal Shrinkage

- The hippocampus shrinks in late adulthood
- Decreased in blood flow to your brain (*Blood pressure drugs*)
- the accumulation of environmental toxins in your brain (*Vaccinations*)
- Sedentary Lifestyle

“The available evidence suggests that the hippocampus plays an important role in the pathophysiology of Depression and Bipolar Disorder”
(Journal of Behavioral Pharmacology)

Medications known to Cause Depression

- Benzodiazepines
- Beta-blockers, methyldopa and other blood pressure medication
- Corticosteroids and Contraceptives
- Sedatives
- Opioids and other pain killers
- Amphetamines
- Antidepressants



Glucocorticoid Therapy and Depression

- Used to treat asthma, allergic reactions, inflammation, and autoimmune disorders
- Drugs Include: cortisone, hydrocortisone and prednisone
- Glucocorticoids act on the hippocampus, amygdala, and frontal lobes

“Glucocorticoids increase the risk of suicidal behavior and neuropsychiatric disorders.

(American Journal of Psychiatry, 2012)

Sugar and Depression

- Sugar (particularly fructose) suppresses a key growth hormone called BDNF (brain derived neurotrophic factor)
- BDNF promotes healthy brain neurons and plays a vital role in memory
- **BDNF levels are critically low in people with depression**

British Journal of Psychiatry

- a diet which contained a lot of processed foods had a **58% increased risk for depression**

MSG and Depression

- Researchers have also discovered that most people with major depressive disease (MDD) have higher levels of the neurotransmitter **glutamate** in their spinal fluid (CSF) and blood plasma.
- Free glutamate, that is, existing outside the neurons, is very toxic to brain connections and brain cells themselves -- mainly by a process called **Excitotoxicity**

Some of the Many names of MSG (monosodium glutamate)

- hydrolyzed proteins
- calcium or sodium caseinate
- soy protein isolate, vegetable protein concentrate or isolate

The 5 Keys to Health and Healing



Proper nerve supply



Regular Exercise



Proper Nutrition



Sufficient Rest



Prayer and Meditation

The Nervous System

- The nervous system controls **every function of the body**
- Neurological imbalance leads to disruption of endocrine function
- Chiropractic care is essential to stimulate the nervous system to promote healing and normal function

“76% of those patients reported a mental/emotional improvement, as well as positive changes in stress and life enjoyment over a period of several months following the chiropractic care.”

(Journal of Upper Cervical Chiropractic Research, 2013)

The Nervous System

Benefits of Chiropractic Care for Depression

- Alleviates pain
- Boosts Productivity
- Improves quality of life
- Improves Cognitive Function
- Reduces Dependency on Medications
- Improves quality of Sleep
- Reduces stress
- Boosts your Immunity



According to:

The Spine Journal

Journal of Vertebral Subluxation Research

Journal of Manipulative and Physiological

Therapeutics

Sympathetic Nervous System Vs. Antidepressant

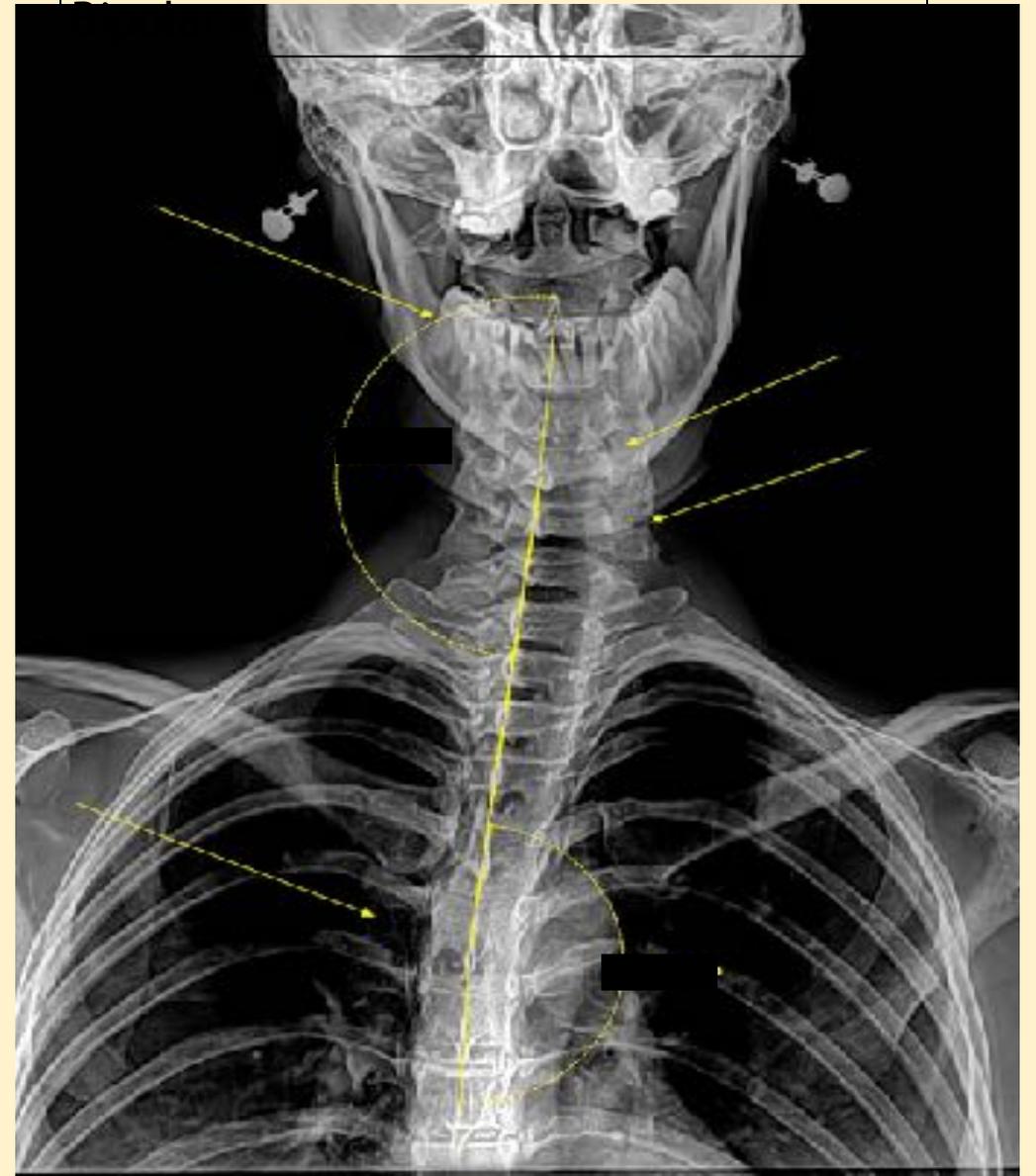


Altered structure causes Altered Function of the Brain

Jane 52 yo just recovered from



Kay 44 yo 7 Rx's for Dx of 7 years



Exercise and Brain Plasticity

- Exercise training increases size of hippocampus and improves memory
- Aerobic exercise training is effective at **reversing hippocampal volume** loss in late adulthood
- increases blood flow to your brain
- increases oxygen supply to your brain
- encourages a more vigorous **release of accumulated toxins** through better blood circulation
- Increased blood flow increases nutrients necessary to keep your brain cells

“Moderate exercise can reverse normal brain shrinkage by two percent, effectively reversing age-related hippocampal degeneration by one to two years”

Exercise and Brain Plasticity

*"We demonstrate that loss of hippocampal volume in late adulthood is not inevitable and can be reversed with **moderate-intensity exercise.**"*

"There is a striking ability of environmental enrichment and physical exercise to empower adult brain plasticity."

(Physiology Review)



Exercise and Brain Plasticity

"What we're finding in the research on physical exercise is that **exercise is at least as good as antidepressants** for helping people who are depressed... physical exercise changes the level of serotonin in your brain. And it increases your endorphin levels, your "feel good hormones."

“And also—and these are amazing studies—**exercise can increase the number of cells in your brain, in the region of the brain called the hippocampus.** These studies were first done on animals, and they're very important because sometimes in depression, there are fewer of those cells in the hippocampus.”

Dr. James S. Gordon, MD,

World-renowned expert in using
Mind-Body medicine to heal depression

Proper Nutrition

Vitamin D

- Helps produce serotonin in the brain
- Activated Vitamin D receptors increase nerve growth in your brain
- The combination of Vitamin D, Tryptophan and Omega-3 fats can naturally elevate concentration of brain serotonin without side effects
- People with Low vitamin D levels are 11 times more prone to depression

Omega 3

- Animal based Omega 3: Sardines, Mackerel, and Anchovies
- The single most important nutrient for optimal brain function
- Low DHA levels have been linked to depression, memory loss, Schizophrenia and Alzheimer's disease

Optimize Your Gut Flora

- 90% of serotonin is produced in the digestive system
- The **Probiotic Lactobacillus Rhamnosus** has been shown to lower the stress hormone corticosterone, resulting in reduced anxiety and depression
- **Bifidobacterium Longum** has been shown to normalize anxiety-like behavior
- Eliminate processed foods, especially sugar
- Organic plant based diet
- Healthy fats such as coconut oil
- Fermented Vegetables
- Probiotic Supplements



Sleep

- Proper REM sleep plays a very important role in Depression
- Any disruption of the **Circadian Rhythm** can result in loss of sleep which can develop into depression
- **Light** is your body's primary cue
- Limit your exposure to artificial (Blue) light
- Expose your body to as much natural sunlight as you can
- Take the proper steps to achieve REM sleep



Meditation

- Meditation can alter the physical structure of the brain
- This includes any repetitive activity that requires higher cognitive function
- The structure of the brain can change in response to repeated practice

Researchers at Harvard, Yale, and the M.I.T.

“Our data suggest that meditation practice can promote cortical plasticity in adults in areas important for cognitive and emotional processing and well-being.”



Balancing your Emotions

The Demartini Breakthrough Experience

- An extremely effective technique for balancing your emotions
- A logical process of balancing negatively charged emotions and emotionally charged events
- **Event + Perception = Outcome (Emotional Response)**
- By changing your perception of an event you can change the outcome which is your emotional response

Emotional Freedom Technique (EFT)

- A form of psychological acupressure
- This technique can be performed by an EFT practitioner
- You can learn to do this technique effectively on your own

Neurolinguistic Programming

- A system of alternative therapy intended to help model and change a person's pattern of mental and emotional behavior
- Sometimes referred to as **Incantations**
- Use your body and your voice with enough intensity and repetition to program your mind

The 4 keys to Neurolinguistic Programming are:

- Body Posture
- Intonation
- Breathing
- Volume

The “I AM” Exercise

-An exercise using Neurolinguistic Programming that starts with “I AM” followed by a positive and powerful adjective.

- Enthusiastic
- Fulfilled
- Compassionate
- Fascinated
- Friendly
- Interested
- Invigorated
- Loving
- Passionate
- Vibrant
- Warm
- Delighted
- Serene
- Blissful
- Glad
- Empowered
- Ecstatic
- Optimistic
- Trusting
- Proud
- Amazed
- Tickled
- Radiant
- Rejuvenated
- Thrilled
- Surprised
- Satisfied

“I AM excited to take on the tasks of the day. I AM strong, intelligent, beautiful, and healthy. An abundance of wealth and love are constantly flowing to me.”

The 5 Keys to Health and Healing



Proper nerve supply



Regular Exercise



Proper Nutrition



Sufficient Rest



Prayer and Meditation

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References

1. Salmans, Sandra (1997). *Depression: Questions You Have - Answers You Need*. People's Medical Society.
2. *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)*. American Psychiatric Association. 2013.
3. Cvetkovich, Ann (2012). *Depression: A Public Feeling*. Durham, NC: Duke University Press Books.
4. Christine Heim; D. Jeffrey Newport; Tanja Mletzko; Andrew H. Miller; Charles B. Nemeroff (July 2008). "[The link between childhood trauma and depression: Insights from HPA axis studies in humans](#)". *Psychoneuroendocrinology* **33** (6): 693-710.
5. Pillemer, Karl; Suito, J. Jill; Pardo, Seth; Henderson Jr, Charles (2010). "Mothers' Differentiation and Depressive Symptoms Among Adult Children". *Journal of Marriage and Family* **72** (2): 333-345.
6. Lindert J, von Ehrenstein OS, Grashow R, Gal G, Braehler E, Weiskopf MG (April 2014). "Sexual and physical abuse in childhood is associated with depression and anxiety over the life course: systematic review and meta-analysis". *Int J Public Health* **59** (2): 359-72.
7. Schmidt, Peter (2005). "Mood, Depression, and Reproductive Hormones in the Menopausal Transition". *The American Journal of Medicine*. 118 Suppl 12B (12): 54-8.
8. Rashid, T.; Heider, I. (2008). "Life Events and Depression" (PDF). *Annals of Punjab Medical College* **2** (1).
9. Douglas A. Mata, Marco A. Ramos, Narinder Bansal, Rida Khan, Constance Guille, Emanuele Di Angelantonio & [Srijan Sen](#) (2015). "Prevalence of Depression and Depressive Symptoms Among Resident Physicians: A Systematic Review and Meta-analysis". *JAMA* **314** (22): 2373-2383.
10. Davey, C. G.; Yücel, M; Allen, N. B. (2008). "The emergence of depression in adolescence: Development of the prefrontal cortex and the representation of reward". *Neuroscience & Biobehavioral Reviews* **32** (1): 1-19.
11. American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders, fifth edition*. Arlington, VA: American Psychiatric Association.
12. Ehret M, Sobieraj DM (February 2014). "Prevention of interferon-alpha-associated depression with antidepressant medications in patients with hepatitis C virus: a systematic review and meta-analysis". *Int. J. Clin. Pract.* **68** (2): 255-61.
13. Guina, Jeffrey; Rossetter, Sarah R.; DeRHODES, Bethany J.; Nahhas, Ramzi W.; Welton, Randon S. (2015-07-01). "[Benzodiazepines for PTSD: A Systematic Review and Meta-Analysis](#)". *Journal of Psychiatric Practice* **21**(4): 281-303.
14. Anderson, IM; Haddad, PM; Scott, J (Dec 27, 2012). "Bipolar disorder.". *BMJ (Clinical research ed.)* **345**: e8508.
15. American Psychiatry Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Arlington: American Psychiatric Publishing. pp. 123-154.
16. Archives of General Psychiatry, 2005 Jun; 62(6): 617-27
17. U.S. Census Bureau Population Estimates by Demographic Characteristics, 2005
18. Journal of the American Medical Association, 2003; Jun 18; 289(23): 3095-105
19. Center for Mental Health Services, U.S. Dept. of Health and Human Services, 1996
20. National Institute of Mental Health, 2002

References

21. http://www.dbsalliance.org/site/PageServer?pagename=education_statistics_depression
22. World Health Organization, "Global Burden of Disease," 1996
23. The Wall Street Journal, 2001, National Institute of Mental Health, 1999
24. Goodwin, Guy M. "Bipolar disorder". *Medicine* 40 (11): 596-598.
25. Lewis, AJ (1934). "[Melancholia: A Historical Review.](#)". *Journal of Mental Science* 80 (328): 1-42.
26. Berrios, G E (1985). "The Psychopathology of Affectivity: Conceptual and Historical Aspects". *Psychological Medicine* 15 (4): 745-758.
27. The ICD-10 Classification of Mental and Behavioural Disorders. World Health Organisation. 1993.
28. An estimated 1 in 10 U.S. adults report depression. (2011, March 31). Retrieved from <http://www.cdc.gov/features/dsdepression/>
29. Depression: Fact sheet. (2012, October). Retrieved from <http://www.who.int/mediacentre/factsheets/fs369/en/>
30. Major depression among adults. (n.d.). Retrieved from <http://www.nimh.nih.gov/health/statistics/prevalence/major-depression-among-adults.shtml>
31. Mayo Clinic Staff. (2014, February 21). Depression (major depressive disorder). Retrieved from <http://www.mayoclinic.org/diseases-conditions/depression/basics/definition/CON-20032977?p=1>
32. Department of Health and Human Services (1999). "[The fundamentals of mental health and mental illness](#)" (PDF). *Mental Health: A Report of the Surgeon General*. Retrieved 11 November 2008.
33. [Mol Psychiatry](#). 2013 Apr;18(4):497-511. doi: 10.1038/mp.2012.21. Epub 2012 Apr 3.
34. Nierenberg, AA (2009). "[The long tale of the short arm of the promoter region for the gene that encodes the serotonin uptake protein](#)" (PDF). *CNS spectrums* 14 (9): 462-3.
35. Caspi, A.; Sugden, K.; Moffitt, T. E.; Taylor, A.; Craig, I. W.; Harrington, H.; McClay, J.; Mill, J.; Martin, J.; Braithwaite, A.; Poulton, R. (2003). "Influence of Life Stress on Depression: Moderation by a Polymorphism in the 5-HTT Gene". *Science* 301 (5631): 386-389.
36. Kendler, K.; Kuhn, J.; Vittum, J.; Prescott, C.; Riley, B. (2005). "The interaction of stressful life events and a serotonin transporter polymorphism in the prediction of episodes of major depression: a replication". *Archives of General Psychiatry* 62 (5): 529-535.
37. Gillespie, N. A.; Whitfield, J. B.; Williams, B.; Heath, A. C.; Martin, N. G. (2005). "The relationship between stressful life events, the serotonin transporter (5-HTTLPR) genotype and major depression". *Psychological Medicine* 35 (1): 101-111
38. Surtees, P.; Wainwright, N.; Willis-Owen, S.; Luben, R.; Day, N.; Flint, J. (2006). "Social adversity, the serotonin transporter (5-HTTLPR) polymorphism and major depressive disorder". *Biological Psychiatry* 59 (3): 224-229.
39. Uher, R.; McGuffin, P. (2008). "The moderation by the serotonin transporter gene of environmental adversity in the aetiology of mental illness: review and methodological analysis". *Molecular Psychiatry* 13 (2): 131-146.
40. Risch, N.; Herrell, R.; Lehner, T.; Liang, K.; Eaves, L.; Hoh, J.; Griem, A.; Kovacs, M.; Ott, J.; Merikangas, K. R. (2009). "Interaction between the serotonin transporter gene (5-HTTLPR), stressful life events, and risk of depression: a meta-analysis". *Journal of the American Medical Association* 301 (23): 2462-2471.
41. Munafo, M.; Durrant, C.; Lewis, G.; Flint, J. (2009). "Gene × Environment Interactions at the Serotonin Transporter Locus". *Biological Psychiatry* 65 (3): 211-219.

References

42. Uher, R.; McGuffin, P. (2010). "The moderation by the serotonin transporter gene of environmental adversity in the etiology of depression: 2009 update". *Molecular Psychiatry* **15** (1): 18-22.
43. Levinson, D. (2006). "The genetics of depression: a review". *Biological Psychiatry* **60** (2): 84-92
44. Dwivedi Y (2009). "Brain-derived neurotrophic factor: role in depression and suicide". *Neuropsychiatr Dis Treat* **5**: 433-49.
45. Krishnan, V.; Nestler, E. (2008). "The molecular neurobiology of depression". *Nature* **455** (7215): 894-902.
46. Pezawas, L.; Meyer-Lindenberg, A.; Goldman, A. L.; Verchinski, B. A.; Chen, G.; Kolachana, B. S.; Egan, M. F.; Mattay, V. S.; Hariri, A. R.; Weinberger, D. R. (2008). "Evidence of biologic epistasis between BDNF and SLC6A4 and implications for depression". *Molecular Psychiatry* **13** (7): 709-716.
47. Carlson, N. (2013). *Physiology of behavior*. (11 ed., pp. 578-582). United States of America: Pearson.
48. Adrien J.. Neurobiological bases for the relation between sleep and depression. *Sleep Medicine Review*. 2003;6(5):341-51.
49. Carlson, N. (2013). *Physiology of behavior*. (11 ed., pp. 578-580). United States of America: Pearson.
50. Terman M. Evolving applications of light therapy. *Sleep Medicine Review*. 2007;11(6):497-507
51. Neil Carlson: *Foundations of Physiological Psychology*, 6th ed. 2005. [ISBN 0-205-42723-5](#) Page: 108
52. Nutt DJ (2008). "Relationship of neurotransmitters to the symptoms of major depressive disorder". *Journal of Clinical Psychiatry*. 69 Suppl E1: 4-7.
53. Neil Carlson: *Foundations of Physiological Psychology*, 6th ed. 2005. [ISBN 0-205-42723-5](#) Page: 108
54. Nutt DJ (2008). "Relationship of neurotransmitters to the symptoms of major depressive disorder". *Journal of Clinical Psychiatry*. 69 Suppl E1: 4-7.
55. Mandell AJ, Knapp S (1979). "Asymmetry and mood, emergent properties of serotonin regulation: A proposed mechanism of action of lithium". *Archives of General Psychiatry* **36** (8): 909-16.
56. Hirschfeld RM (2000). "History and evolution of the monoamine hypothesis of depression". *Journal of Clinical Psychiatry*. 61 Suppl 6: 4-6.
57. Hirschfeld RM (2000). "History and evolution of the monoamine hypothesis of depression". *Journal of Clinical Psychiatry*. 61 Suppl 6: 4-6. [PMID 10775017](#).
58. Delgado PL, Moreno FA (2000). "Role of norepinephrine in depression". *J Clin Psychiatry*. 61 Suppl 1: 5-12. [PMID 10703757](#).
59. Delgado PL (2000). "Depression: the case for a monoamine deficiency". *Journal of Clinical Psychiatry*. 61 Suppl 6: 7-11. [PMID 10775018](#).
60. Lacasse J, Leo J (2005). "Serotonin and Depression: A Disconnect between the Advertisements and the Scientific Literature". *PLoS Med* **2** (12): e392. [doi:10.1371/journal.pmed.0020392](#). [PMC: 1277931](#). [PMID 16268734](#)
61. Valenstein ES (1998) *Blaming the brain: The truth about drugs and mental health*. New York: Free Press. 292 p.
62. Glenmullen J (2001) *Prozac backlash: Overcoming the dangers of prozac, zoloft, paxil and other antidepressants with safe, effective alternatives*. New York: Simon and Schuster. 384 p.

References

63. Horgan J (1999) *The undiscovered mind: How the human brain defies replication, medication, and explanation*. New York: Free Press. 336 p.
64. Stahl SM (2000) *Essential psychopharmacology: Neuroscientific basis and practical applications*. Cambridge: Cambridge University Press. 601 p.
65. Delgado P, Moreno F (2000) Role of norepinephrine in depression. *J Clin Psychiatry* 61: Supple 15-11.
66. Lacasse JR, Gomory T (2003) Is graduate social work education promoting a critical approach to mental health practice? *J Soc Work Educ* 39: 383-408.
67. Kendler KS (2005) Toward a philosophical structure for psychiatry. *Am J Psychiatry* 162: 433-440.
68. Healy D (2004) *Let them eat prozac: The unhealthy relationship between the pharmaceutical companies and depression*. New York: New York University. 351 p.
69. International Marketing Services Health (2004) Year-end U.S. Prescription and sales information and commentary. (Connecticut): Fairfield. International Marketing Services Health Available: http://www.imshealth.com/ims/portal/front/articleC/0,2777,6599_3665_69890098,00.html.
70. Forest Pharmaceuticals (2005) Frequently asked questions. New York: Forest Pharmaceuticals. Available: <http://www.celexa.com/Celexa/faq.aspx>.
71. Forest Pharmaceuticals (2005) How Lexapro (escitalopram) works. New York: Forest Pharmaceuticals. Available: http://www.lexapro.com/english/about_lexapro/how_works.aspx
72. Eli Lilly (1998 January) Prozac advertisement. *People Magazine*: 40.
73. GlaxoSmithKline (2001 October) Paxil advertisement. *Newsweek*: 61.
74. Pfizer (2004 March) Zoloft advertisement. Burbank (California): NBC.
75. http://www.researchandmarkets.com/research/p35qmw/u_s
76. <http://www.health.harvard.edu/blog/astounding-increase-in-antidepressant-use-by-americans-201110203624>
77. Lacasse J, Leo J (2005). "Serotonin and Depression: A Disconnect between the Advertisements and the Scientific Literature". *PLoS Med* 2 (12): e392. doi:10.1371/journal.pmed.0020392. PMC: 1277931. PMID 16268734. [Free full text, open-access source](#)
78. Young SN (2007). "How to increase serotonin in the human brain without drugs". *Rev. Psychiatr. Neurosci.* 32 (6): 394-99. PMC: 2077351. PMID 18043762.
79. González-Flores D, Velardo B, Garrido M, González-Gómez D, Lozano M, Ayuso M.C, Barriga C, Paredes S.D, Rodríguez A.B. (2011). "[Ingestion of Japanese plums \(Prunus salicina Lindl. cv. Crimson Globe\) increases the urinary 6-sulfatoxymelatonin and total antioxidant capacity levels in young, middle-aged and elderly humans: Nutritional and functional characterization of their content](#)". *Journal of Food and Nutrition Research* 50(4): 229-236.
80. King MW. "[Serotonin](#)". *The Medical Biochemistry Page*. Indiana University School of Medicine. Retrieved 1 December 2009.
81. Berger M, Gray JA, Roth BL; Gray; Roth (2009). "The expanded biology of serotonin". *Annu. Rev. Med.* 60: 355-66.
82. Indigenous Bacteria from the Gut Microbiota Regulate Host Serotonin Biosynthesis, [http://www.cell.com/cell/abstract/S0092-8674\(15\)00248-2](http://www.cell.com/cell/abstract/S0092-8674(15)00248-2)
83. Rang, H. P. (2003). *Pharmacology*. Edinburgh: Churchill Livingstone. p. 187. ISBN 0-443-07145-4.

References

84. Ozanne, S.E.; Hales, C.N. (2004). "Lifespan: catch-up growth and obesity in male mice". *Nature*. **427** (6973): 411-2. [Bibcode:2004Natur.427..411O](#). [doi:10.1038/427411b](#). [PMID 14749819](#)
85. Lewis, D.S.; Bertrand, H.A.; McMahan, C.A.; McGill Jr, H.C.; Carey, K.D.; Masoro, E.J. (1986). "Prewaning food intake influences the adiposity of young adult baboons". *J Clin Invest* **78** (4): 899-905.
86. Hahn, P. (1984). "Effect of litter size on plasma cholesterol and insulin and some liver and adipose tissue enzymes in adult rodents". *J Nutr*. **114** (7): 1231-4.
87. McDuffie JE, Motley ED, Limbird LE, Maleque MA; Motley; Limbird; Maleque (2000). "5-hydroxytryptamine stimulates phosphorylation of p44/p42 mitogen-activated protein kinase activation in bovine aortic endothelial cell cultures". *J. Cardiovasc. Pharmacol.* **35** (3): 398-402.
88. Marieb, Elaine Nicpon (2009). *Essentials of human anatomy & physiology*(Eighth ed.). San Francisco: Pearson/Benjamin Cummings. p. 336. [ISBN 0-321-51342-8](#).
89. [BMJ Open December 14, 2015](#)
90. [JAMA Pediatrics December 14, 2015](#)
91. [Scientific American August 27, 2014](#)
92. [PLOS Medicine February 26, 2008](#)
93. [New York Times September 1, 2014](#)
94. [JAMA Pediatrics December 14, 2015](#)
95. [Medicine Net December 14, 2015](#)
96. [NZ Herald December 16, 2015](#)
97. [WebMD April 14, 2014](#)
98. [FASEB Journal February 20, 2014 \[Epub ahead of print\] \(PDF\)](#)
99. [Newswise March 10, 2014](#)
100. [Vitamin D Council, Vitamin D and Autism](#)
101. [American Journal of Obstetrics & Gynecology Volume 193, Issue 6, Supplement, Page S36, December 2005](#)
102. [Molecular Psychiatry August 26, 2014](#)
103. [3 News August 27, 2014](#)
104. [BMJ July 8, 2015](#)

References

105. [WebMD July 8, 2015](#)
106. [BJOG. 2014 Dec;121\(13\):1621-31](#)
107. [PLoS One. 2014 Mar 26;9\(3\):e92778.](#)
108. [JAMA Psychiatry. 2013 Apr;70\(4\):436-43.](#)
109. [CMAJ. 2010 Jul 13;182\(10\):1031-7.](#)
110. [Arch Intern Med. 2007 Jan 22;167\(2\):188-94.](#)
111. [Archives of Internal Medicine December 14/28 2009;169\(22\):2128-2139](#)
112. [Study presented at the American College of Cardiology meeting, New Orleans, LA April 5, 2011](#)
113. [SSRI Stories](#)
114. [BMJ December 8, 2015](#)
115. American Journal of Geriatric Psychiatry December 2006; 14(12): 1032-1040
116. [Effects of Omega-3 Fatty Acids on Mental Health, Agency for Healthcare Research and Quality, Evidence Report/Technology Assessment: Number 116](#)
117. Livingston, R.B. (1966) Brain mechanisms in conditioning and learning. *Neurosciences Research Program Bulletin* 4(3):349-354.
118. Rakic, P. (January 2002). "Neurogenesis in adult primate neocortex: an evaluation of the evidence". *Nature Reviews Neuroscience* 3 (1): 65-71.
119. Pascual-Leone A., Freitas C., Oberman L., Horvath J. C., Halko M., Eldaief M.; et al. (2011). "Characterizing brain cortical plasticity and network dynamics across the age-span in health and disease with TMS-EEG and TMS-fMRI". *Brain Topography* 24: 302-315.
120. *Physiol Rev.* 2014 Jan
121. [Arch Gen Psychiatry.](#) 2011 Apr;68(4):340-50. doi: 10.1001/archgenpsychiatry.2010.175. Epub 2010 Dec 6.
122. Laurence Fardet, M.D., Ph.D.; Irene Petersen, Ph.D.; Irwin Nazareth, M.D., Ph.D. *Am J Psychiatry* 2012;
123. Fructose malabsorption, a very common condition with surprising correlates. Published on May 24, 2011 by Emily Deans, M.D in *Evolutionary Psychiatry*
124. <http://articles.mercola.com/sites/articles/archive/2011/03/07/reversing-depression-without-antidepressants.aspx>
125. <http://articles.mercola.com/sites/articles/archive/2011/03/07/reversing-depression-without-antidepressants.aspx>
126. [BMJ.](#) 2015 Dec 8;351:h6019. doi: 10.1136/bmj.h6019.
127. *Proc Natl Acad Sci U S A.* 2011 Sep 20;108(38):16050-5.
128. *Neurogastroenterol Motil.* 2011 Dec;23(12):1132-9.
129. *JMPT* 1999; 22:594-609
130. *JMPT* 2005;28:502-7

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