

Bipolar Disorder

Bipolar disorder is a mood disorder. People with bipolar disorder will have drastic mood swings. They go from depressed to manic or hypomanic, sometimes overnight. It also blocks executive functioning and interferes with memory.

Parts of the brain that are affected by bipolar disorder

Frontal Lobe Involved with behavior, emotions, reactions, motivation

Cingulate Cortex Connects structures involved with emotions and pain

Amygdala Involved with emotions

Basal Ganglia Involved with movement, habits, emotions
Affects emotional instability, depression

Pons Involved with attention

Thalamus Sends information to other parts of the brain
Affects executive functioning issues

Cerebellum Involved with memory, motor skills

Hippocampus Involved with memory
Affects memory

Mania and Hypomania

Mania is the opposite of depression. Sometimes mania means the person is excessively happy, but they may also feel irritated or angry.

Hypomania is a less severe form of mania. Mixed episodes can also occur where the brain is depressed and manic at the same time. These episodes are extremely dangerous and must be taken seriously.

What is executive functioning?

Executive functioning is the little voice in your head that controls your actions. It is involved with many things, such as self-control and working memory.

Further Reading

The Brain by BrainFacts.org, 2022. <https://www.brainfacts.org/3d-brain#intro=false&focus=Brain>
An interactive digital 3D brain

Foundations of Neuroscience by Casey Henley, 2021. <https://openbooks.lib.msu.edu/neuroscience/>
A free textbook about how the brain works

Psychiatric medication A to Z by Mind, 2022. <https://www.mind.org.uk/information-support/drugs-and-treatments/medication/drug-names-a-z/>
A list of medications and their side effects

Nursing Pharmacology by Chippewa Valley Technical College, 2020. <https://wtcs.pressbooks.pub/pharmacology/>
A free textbook about medications are processed in the body

DSM-5, 2013.

The diagnostic manual for all mental disorders. It is not open access but can likely be found at your local library

Medications often used for bipolar disorder

These medications seek to stabilize mood via a wide variety of processes.

SSRIs

- Leads to more serotonin in frontal lobe

- Helps mood

- Often causes (hypo)mania when not used with other medication

Lithium

- Preserves or increases size of the frontal lobe, hippocampus, amygdala

- Protects brain from future damage

- We do not know how this happens

- Reduces excitatory neurotransmitters (dopamine and glutamate), increases inhibitory neurotransmitters (GABA)

- Helps calm the brain down

- Can cause slower thinking, emotional numbness

- Dopamine is also involved with motor function, which may be why lithium can cause tremors

Atypical Antipsychotics

- Blocks dopamine receptors in thalamus, hypothalamus, frontal lobe, basal ganglia

- Affects motivation

- Can cause muscle issues

- Inhibits norepinephrine release

- Calms the fight or flight part of the brain

- Activates serotonin receptors

- Helps improve mood

Neurotransmitters: How Does the Brain Talk to Itself?

Parts of the brain will release chemicals that tell other parts of the brain what to do. Some chemicals will make the brain more active or calm it down, and some are connected with certain moods.

Serotonin involved with mood

Norepinephrine involved with excitement, “fight or flight” response

Dopamine involved with motivation and movement

Glutamate involved with increasing brain function

GABA involved with calming brain function

If you see these symptoms in yourself or a loved one, see a medical professional. You can text your zip code to 898211 to find local resources. If you are in an active crisis, call 911.

Works Cited

Liang, M., Zhou, Q., Yang, K.-R., Yang, X.-L., Fang, J., Chen, W.-L., & Huang, Z. (2013). Identify Changes of Brain Regional Homogeneity in Bipolar Disorder and Unipolar Depression Using Resting-State fMRI. *PLoS One*, 8(12), e79999–e79999. <https://doi.org/10.1371/journal.pone.0079999>

Available at: <https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0079999&type=printable>

Ge, W., & Jakobsson, E. (2018). Systems Biology Understanding of the Effects of Lithium on Affective and Neurodegenerative Disorders. *Frontiers in Neuroscience*, 12, 933–933. <https://doi.org/10.3389/fnins.2018.00933>

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