

# 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>

Available at:

[https://na01.alma.exlibrisgroup.com/view/action/uresolver.do?operation=resolveService&package\\_service\\_id=21747538260001853&institutionId=1853&customerId=1840](https://na01.alma.exlibrisgroup.com/view/action/uresolver.do?operation=resolveService&package_service_id=21747538260001853&institutionId=1853&customerId=1840)

Information compiled via Portland State University. Email [bharbury@pdx.edu](mailto:bharbury@pdx.edu) with any questions.