

# OCD-ADHD Together

## *A Walking Contradiction*

By Chloe Hall



*“For me, OCD feels like you’re not in control of your brain. Intrusive thoughts — vivid, visual images of the most horrendous things — plague me on a daily basis. I pick up a knife to chop an onion and see myself stabbing someone.... Ruminations over past events play in my mind so loudly it’s almost as though they’re audible. A constant soundtrack to my days, it’s as though I’m listening to the same song on repeat for years, only the song is a hellish event from my past and it accompanies me from the second I open my eyes to the second I finally manage to close them at night”*

## OCD: Checking that the Car Is Locked 17 Times

This is the testimony of Alice Franklin, an obsessive-compulsive disorder (OCD) patient writing in an attempt to explain what it feels like to have the disorder. OCD is a mental disorder characterized by obsessions and compulsions. Obsessions are recurring thoughts or images that loop through the mind to the point that the thoughts become uncontrollable. A few of the many examples of possible

obsessions that someone could have include fear of contamination, unwanted or taboo sexual thoughts, thoughts of harm toward others or toward one's self, and/or perfectionism to the point that it reduces quality of life and interferes with normal activities and obligations. Compulsions are attempts to control the anxiety that these obsessions cause. The word "compulsive," when used to describe a behavior, means doing something because you feel like you have to, not because you want to. These compulsions usually take the form of a behavior such as cleaning the house repeatedly, excessive hand washing, checking locks, putting objects in particular orders, avoiding triggers, or completing tics. For example, if someone has an obsession that involves the fear of contaminated water, they would perform compulsions like only drinking bottled water, avoiding washing hands, avoiding public restrooms, and repeatedly cleaning water filters with bleach or another disinfectant. OCD onset usually occurs during the adolescent years, and a major risk factor is having family members with OCD. The predominant theory of what causes OCD on a molecular level is that there is too little of the neurotransmitter serotonin in the brain. Neurotransmitters are chemicals that help the brain function normally, and serotonin specifically helps regulate mood and sleep. If there is too little of it, the brain generally becomes more anxious and depressed, and in some cases, develops obsessions and compulsions<sup>2</sup>.

A real patient case study of OCD symptoms comes from Allen, a young janitor who sought out help for crippling anxiety from a local clinic. He could not control the constant fear that he would contract HIV. (This would be the obsession element of OCD). In

an attempt to control the anxiety that this obsession caused him, Allen avoided touching things outside of his own home, washed his hands multiple times a day with bleach, avoided physical contact, and avoided romantic and social relationships. These behaviors are the compulsive element of the disorder. Allen additionally feared hurting people. His mind was bombarded with images of hitting strangers or offending his neighbors during casual conversation. His compulsions that stemmed from these anxieties included replaying conversations he had with these people repeatedly, as well as attempting to avoid interactions with people altogether. These compulsions, if the disorder is severe enough like in Allen's case, can completely consume a patient's life. Thankfully, many patients find successful treatment with SSRIs (serotonin reuptake inhibitors like Prozac) and CBT (cognitive behavioral therapy), a type of psychotherapy that has been shown to be effective at treating a range of anxiety and mood disorders<sup>2</sup>. As mentioned before, OCD is believed to be caused at least in part by a lack of serotonin. SSRIs are medications that stop the brain from recycling serotonin so that there is more serotonin floating around in the brain to help normalize thought patterns and behavior.

Another interesting component of the OCD brain is that the disorder is comorbid with many other disorders, including (but not limited to) anxiety, depression, and eating disorders<sup>2</sup>. When a disorder is "comorbid" with another disorder, this means that they commonly occur together. For example, among people with anxiety, there is a higher proportion of people who additionally have OCD when compared to the proportion of people with OCD in

the rest of the population. Another disorder that is considered to be comorbid with OCD is ADHD. Comorbid disorders are disorders that are often diagnosed together, as the rates of one illness is higher in populations who have the other illness, suggesting that their root causes or underlying neurobiology may overlap. OCD and ADHD comorbidity has been found to be significant: a recent study found that the rate of ADHD in OCD patients is 11.8%, much higher than the 5% of people estimated to have ADHD in the general population<sup>4</sup>. Even more significantly, 25.5% of pediatric OCD patients are diagnosed with ADHD. While anxiety, depression, and eating disorders (as well as most other mental disorders that are comorbid with OCD) share a similar symptom set and underlying neurobiology, ADHD is set apart because it is actually very different from OCD in almost every way.

## ADHD: Leaving the Car Running and Losing the Keys

*"People will be talking to me, and I'll stop hearing what they're saying. And it's the same sort of thing [as with reading]. I'll go through the motions, nod my head, mirror their body language and stuff. But the information isn't coming through.... I could see my classmates finishing the assignments in 10 to 30 minutes, but they'd take me hours and hours and hours and sometimes I couldn't complete them...The processes that needed to go on simultaneously to complete the tasks just wouldn't line up"*

This is a statement from Eliana, a young woman with ADHD, describing the difficulties she has faced as a result of her condition. ADHD is a common mental disorder that can also be referred

to colloquially as “ADD.” ADHD, or attention-deficit/ hyperactivity disorder, is a mental disorder characterized by an inability to sustain focus (inattention), hyperactivity, lack of inhibition, disorganization, and impulsivity. Having a lack of inhibition /or being impulsive means having trouble controlling one’s impulses. People with ADHD have trouble with paying attention and self-control more than people in the general population. It was thought up until fairly recently that only children could have ADHD, however, symptoms can continue throughout adulthood. ADHD patients tend to struggle in school, have trouble completing tasks that require sustained focus, interrupt others frequently, struggle to regulate emotions, lose objects, and forget various day-to-day tasks<sup>8</sup>.

ADHD has three different subtypes, including predominantly inattentive (ADHD-I), predominantly hyperactive-impulsive (ADHD-H), and combined symptoms (ADHD-C). People with the predominantly inattentive type do not tend to struggle as much with being impulsive or hyperactive like people with the predominantly hyperactive-impulsive type, but they do display symptoms of inattention significantly more than their peers. This subtype can also be referred to colloquially as “ADD,” because it was previously considered a different disorder than the other two ADHD subtypes until psychologists agreed to classify ADD as a subtype of ADHD. This population may also be referred to as having ADD (attention deficit disorder, ADHD-I). The fact that these patients may not display abnormal amounts of hyperactivity or impulsivity makes this subtype more difficult to diagnose. Most of the time these are the kids who are not necessarily getting in trouble, and the adults

who can more successfully mask their symptoms. They tend to be labeled as spacey, disorganized, or off in their own world. On the other hand, patients with predominantly hyperactive-impulsive ADHD disproportionately display the impulsive and hyperactive symptoms such as fidgeting and lacking in self-control, although they tend to struggle less with sustaining attention than their peers with the predominantly inattentive type. In fact, patients with this subtype can display an uncommon ability to sustain attention for long periods of time on things they are very interested in<sup>10</sup>. Patients of the combined type would experience both inattentive and hyperactive-impulsive symptoms in somewhat equal measure<sup>9</sup>. This essentially means that people diagnosed with the umbrella term “ADHD” as outlined in the DSM V can actually have one of three subtypes that can present very different symptoms that fall under the same umbrella of one disorder. The first line of treatment for ADHD of all three subtypes tends to be stimulants like Adderall and, in some cases, CBT to help patients understand how to deal with the symptoms of their disorder. Doctors commonly prescribe stimulants because the predominant theory of what the underlying cause of ADHD is believed to be a lack of dopamine in the brain. Dopamine is a neurotransmitter that is involved in helping the brain focus and perform tasks that require attention and mental energy<sup>9</sup>. Just like OCD brains don’t have enough serotonin, ADHD brains don’t have enough dopamine. Just like serotonin is the neurotransmitter whose dysregulation is believed to be a root cause of OCD, dopamine is viewed in a similar manner when it comes to ADHD.

## Dual Diagnosis of ADHD and OCD: Impossible?

The stories of Alice, Allen, and Eliana are the narratives of three of the millions of people worldwide who suffer from OCD or ADHD. These mental disorders, when directly comparing symptoms, may seem unrelated or even mutually exclusive. Many patients who have OCD describe the feeling of being unable to control the near-constant and excessive focus on obsessions (Allen’s struggle to focus on anything besides his fear of contracting HIV), while ADHD patients describe not being able to focus on anything at all (Eliana’s inability to complete schoolwork or listen during conversations). There is also the compulsive versus impulsive paradox: how can the same person display abnormal amounts of both compulsive and impulsive behaviors simultaneously? Despite these inherent contradictions between the two disorders, they are actually considered comorbid conditions. Despite the many dual diagnoses of these disorders and some overlap in symptomatology, including inattention and below average executive function, many psychologists and neuroscientists suggest that they cannot occur in the same patient, despite the immense number of patients who are diagnosed with both disorders<sup>6</sup>.

A prominent example of someone who argues that they are mutually exclusive disorders is Eric Hollander, a famous psychiatrist and neuroscientist who developed the theory of the impulsivity-compulsivity spectrum. This theory essentially argues that certain mental disorders fall somewhere on an impulsive-compulsive spectrum. This would suggest that impulsivity and compulsivity would be sets of symptoms falling on opposite

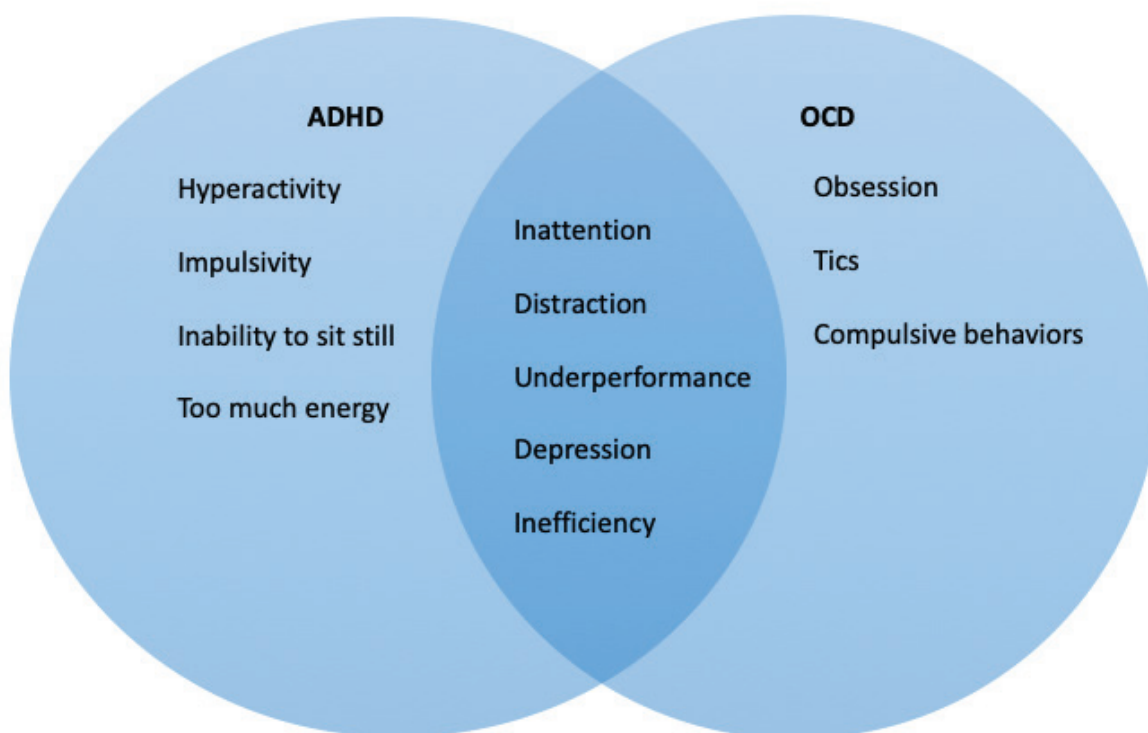
ends of the spectrum. According to this theory, the compulsive end of this continuum would represent OCD (risk-avoiding, excessive self-regulation, excessive thinking before acting) and the impulsive end of the spectrum would represent ADHD (risk-taking, lack of self-regulation, lack of forethought)<sup>5</sup>. On such a continuum, these two disorders could not coexist. To understand this theory, evaluate its accuracy, and reconcile the degree to which these disorders are diagnosed together with the opposing nature of the two disorders, we must examine the underlying cognition, behavior, and neurobiology of OCD and ADHD respectively.

Comparison of the two disorders' symptomatology presents inherent contradictions. ADHD patients who tend to experience the more impulsive/hyperactive symptoms of the disorder tend to have risk-taking and novelty-seeking behaviors. My father could serve as an example of this behavior. When he was 7 years old, he decided to jump from

the roof of his house into a kitty pool with about a foot of water in it. This is just one example of the risky and impulsive behaviors that he engaged in throughout his childhood and well into his adolescent years. After a trip to the emergency room and yet another broken bone, when asked why he did it, his reply was *"I didn't really think about it, but I guess I just wanted to see what would happen."* This response, as well as the act of jumping off of a rooftop with no intent to self-harm, illustrates a lack of inhibition (impulsivity), and is certainly an example of risk-taking and novelty-seeking behavior. On the other hand, patients with OCD generally avoid situations associated with risk or harm, to the point that they feel at risk in situations that do not pose risk or harm to them at all. This can lead to extremely restrained behavior to avoid perceived risk<sup>4</sup>. An extreme example of this is Howard Hughes, an entrepreneur, filmmaker, and aerospace engineer who suffered from severe undiagnosed OCD. His OCD was so severe that it

caused him to not leave a darkened screening room for four months due to his phobia of the unpredictable outside world. In the last years of his life, he became almost completely reclusive to the point that the public questioned whether or not he was still alive<sup>5</sup>. Although these are two fairly extreme examples of behaviors associated with the two disorders, it illustrates that there are behavioral components of OCD and ADHD that seem irreconcilable. How can one person display two traits that seem to occupy polar ends of a spectrum?

fMRI data collected on ADHD and OCD patients present evidence that suggests that the two may not be able to coexist. fMRI, or functional magnetic resonance imaging, is a way for neuroscientists to measure the activity of patients' brains and compare them to the average brain. fMRI is commonly used in clinical studies and can be used to diagnose various mental disorders. A region of the brain that fMRI has identified differences in between ADHD and OCD patients is the frontostriatal region. The



Common Symptoms of ADHD and OCD<sup>6,17,18</sup> Original image by Chloe Hall

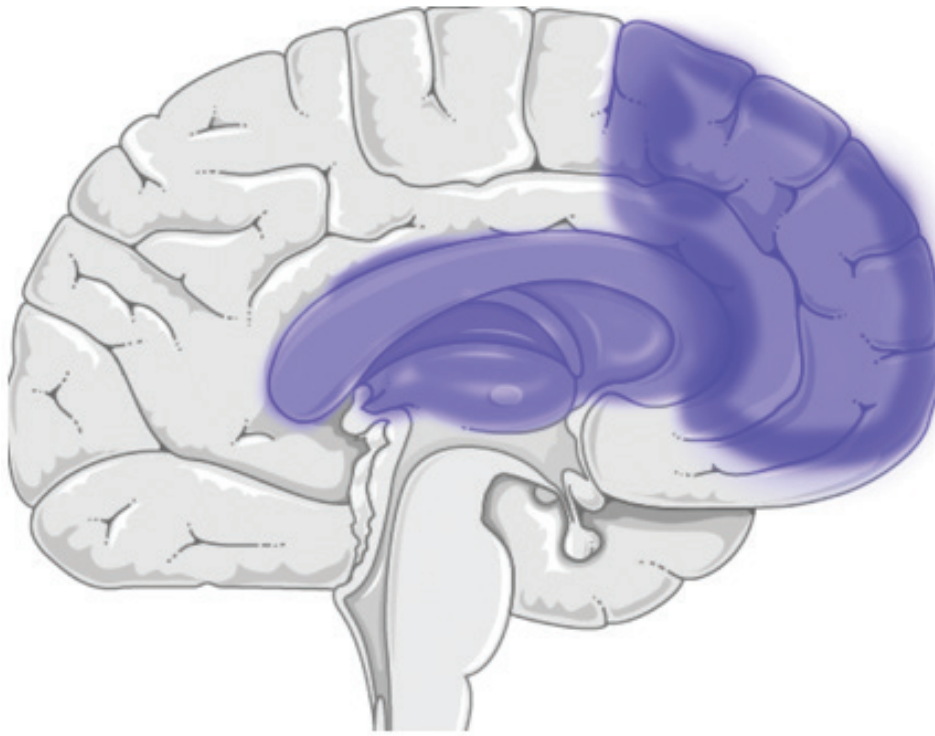


Figure 1. Frontostriatal Region & Prefrontal Cortex<sup>6,17,18</sup>  
 "Brain" by Servier Medical Art by Servier (CC BY 3.0)

frontostriatal system of the brain includes several brain structures that are implicated in concentration, planning, and self-control. This complex system controls our responses to environmental stimuli and regulates responses to stimuli through information processing. If the brain is a team, the frontostriatal region could be thought of as the coach or team captain. Patients with ADHD have been found to have less active frontostriatal regions while patients with OCD display too much activity in this same region<sup>6</sup>. Additionally, a recent study found that the more severe the OCD patient's symptoms were, the *more* active their frontostriatal region was. This same study found that the more severe an ADHD patient's symptoms were, the *less* active their frontostriatal regions<sup>6</sup>. Also, OCD is also associated with too much activity in the prefrontal cortex, while ADHD is associated with too little activity in the prefrontal cortex<sup>6</sup>. The prefrontal cortex is greatly implicated in planning, organization, setting

goals, working memory, and filtering stimuli. It can be compared to the calendar or compass of the brain: it makes plans, helps save memories, and tells you what to do and when. Both the prefrontal cortex and the frontostriatal regions of the brain are highlighted in Figure 1.

## The Complexity of the Brain: It May Not Be So Black and White!

Essentially, the above data suggests that ADHD and OCD cannot logically occur in the same patient. How could a patient have a brain that is both under and overactive in the same regions? How could the same patient display both abnormally impulsive and compulsive behaviors? Recent data seems to support the impulsive-compulsive continuum theory that these two disorders are on opposite sides of the spectrum, while the neurotypical brain falls somewhere in the middle of this

same spectrum<sup>11</sup>. In the purely theoretical sense, this all checks out. But looking at the fact that OCD and ADHD are so commonly diagnosed together (especially in children) that they are considered to be comorbid disorders, the theory does not hold up. Why are so many people being diagnosed with both if they are seemingly opposite disorders in their clinical presentation, patient behavior, and biology? There are only two possible answers to this immensely complex question of whether or not the two can possibly occur together: yes, they can; or, no, millions of people are being misdiagnosed and given the wrong medication each year. Either way, the answer has huge implications for the millions of people diagnosed.

The first possibility to explain this phenomenon is that OCD and ADHD cannot occur in the same patient, and somehow all of the dual diagnoses are OCD (or ADHD) symptoms presenting as the other disorder. This would support the theory of the impulsive-compulsive continuum. Neuroscientists who support this side of the argument believe that the set of OCD symptoms can include ADHD-like symptoms rather than full-blown ADHD symptoms. These ADHD-like symptoms can include inattention and poor performance in school relative to intelligence. This argument is referred to as the Executive Overload Model of OCD. It suggests that the comorbidity between ADHD and OCD actually is due to the fact that OCD includes ADHD-like symptoms. This theory's name is derived from the argument that people who have OCD are so overstimulated by the obsessions and compulsions that they have a lot of trouble paying attention to everyday tasks. Essentially, their brains are so busy with the OCD that their brains do not have the capacity to perform normal tasks.

An example of this could be a student with OCD in a math class. This student is constantly distracted and cannot pay attention or work with the same efficiency as his peers due to his obsession that every number has to be even. He is also anxious because of his obsessions, causing him to be more fidgety than his peers. This restlessness and inattention can easily be misinterpreted as ADHD rather than OCD causing ADHD-like symptoms<sup>13</sup>.

Another potential confounding factor that could affect how we think about and explain the comorbidity between OCD and ADHD is that a growing number of neuroscientists and psychologists are arguing against the DSM V that the three subtypes of ADHD should be classified as one disorder. This would have important implications, especially considering that maybe OCD can only be comorbid with one or two of these subtypes. This could certainly aid in explaining the confusion. More and more people are arguing that predominantly inattentive ADHD (ADD), ADHD of the

combined type, and predominantly hyperactive/impulsive type should be considered separate diagnoses. The reason for this is that some recent studies are arguing that the primary disturbance in ADHD of the inattentive subtype is actually in an entirely different brain circuit than the other two subtypes. If this is the case, this could mean that ADHD-I ADD and OCD could potentially reasonably occur together. An additional idea that could explain the confusion is that some specialists in the field are starting to argue that familial OCD-ADHD may be a blending of both disorders when they are inherited together. A recent study has argued that ADHD and OCD, when diagnosed together, is actually a distinct condition when one parent passes down OCD and the other passes down ADHD<sup>15</sup>. Although this theory is only a theoretical framework, it poses an interesting question that the scientific community should explore.

This is clearly a complex problem the potential that psychiatric patients may be routinely misdiagnosed or

prescribed the wrong medications is a complex and dangerous problem that affects the lives of millions of people. If someone is misdiagnosed with either of these disorders, it could mean that they are prescribed a medication that they do not need. Of even greater concern, it could mean that they are prescribed a medication that makes the disorder they actually have worse. An example of this is that if OCD patients (especially those who do not have ADHD) are prescribed stimulants, there is a large chance that this will worsen their OCD symptoms. The change could happen immediately or over time, but dramatic changes in behavior and brain chemistry can put the patient in danger. This is why it is so important to continue to research ways we can get better at diagnosing and identifying differences between OCD and ADHD symptoms. So many people depend on being prescribed and treated with the correct interventions, and research is the first step to this process of improving the lives of people like Alice and Eliana. ■

## REFERENCES

1. Franklin, A. What it feels like to live with OCD. *International OCD Foundation* (2019).
2. NIH. Obsessive-Compulsive Disorder. *National Institute of Mental Health* (n.d.).
3. APA. Patient Story: OCD. *American Psychiatric Association* (n.d.).
4. Abramovitch, A., Dar, R., Mittelman, A. & Wilhelm, S. Comorbidity between attention deficit/hyperactivity disorder and obsessive-compulsive disorder across the lifespan: a systematic and critical review. *Harvard review of psychiatry* 23(4), 245 (2015).
5. Hughes, H. Later Years. *Encyclopaedia Britannica* (2019).
6. Cabarkapa, S., King, J. A., Dowling, N., & Ng, C. Co-Morbid Obsessive-Compulsive Disorder and Attention Deficit Hyperactivity Disorder: Neurobiological commonalities and treatment implications. *Frontiers in psychiatry* 10, 557 (2019).
7. Letzter, R. What it's like to live with ADHD so severe it feels like 'brain fog'. *Business Insider* (2017).
8. NIH. Attention-Deficit/Hyperactivity Disorder (ADHD): The Basics. *National Institute of Mental Health* (n.d.).
9. *Diagnostic and statistical manual of mental disorders (5th ed.)* (American Psychiatric Association, 2013).
10. Amen Clinics. ADD/ ADHD. *Amen Clinics* (n.d.).
11. Bradshaw, J. L. & Sheppard, D. M. The neurodevelopmental frontostriatal disorders: evolutionary adaptiveness and anomalous lateralization. *Brain and language* 73(2), 297-320, (2000).
12. Fuster, J. *The prefrontal cortex*. (Academic Press, 2015).
13. Abramovitch, A., Dar, R., Mittelman, A. & Schweiger, A. Don't judge a book by its cover: ADHD-like symptoms in obsessive compulsive disorder. *Journal of Obsessive-Compulsive and Related Disorders* 2(1), 53-61, (2013).
14. Diamond, A. Attention-deficit disorder (attention-deficit/hyperactivity disorder without hyperactivity): A neurobiologically and behaviorally distinct disorder from attention-deficit/hyperactivity disorder (with hyperactivity). *Development and psychopathology* 17(3), 807-825, (2005).
15. Geller, D. et al. Examining the relationship between obsessive-compulsive disorder and attention-deficit/hyperactivity disorder in children and adolescents: a familial risk analysis. *Biological Psychiatry*, 61(3), 316-321 (2007).
16. American Friends of Tel Aviv University. Mistaking OCD for ADHD has serious consequences. *Science Daily* (2012).
17. Brem, S., Grünblatt, E., Drechsler, R., Riederer, P. & Walitza, S. The neurobiological link between OCD and ADHD. *ADHD Attention Deficit and Hyperactivity Disorders* 6(3), 175-202 (2014).
18. Graybiel, A. M. & Rauch, S. L. Toward a neurobiology of obsessive-compulsive disorder. *Neuron* 28(2), 343-7 (2000).