Chapter highlights: Psychiatric Disorders (Ch 13)

The purpose of “chapter highlights” is to offer a framework in which to think about the specific information discussed in each Brain Facts chapter. These highlights draw upon information in the chapter and on the new Brain Facts web site (http://www.brainfacts.org) and occasionally, on our own knowledge of neuroscience that may not be discussed in Brain Facts. Questions for Brain Bee will come from Brain Facts (new 2012 publication) and entries from the new Brain Facts web site that have “brainfacts.org” in the URL. Some but not all relevant entries are cited below.

Psychiatric disorders, which include anxiety disorders, Tourette syndrome, depression, bipolar disorder, and schizophrenia, are patterns of behaviors or psychological symptoms that cause distress or disability and interfere with a person’s life. Many psychiatric disorders co-occur with one another, for example, lots of people with anxiety disorders also have major depression.

Anxiety Disorders are considered the most common mental illness.

- **Obsessive-compulsive disorder (OCD)** causes people to have unwanted and repeated thoughts, feelings, ideas, or sensations (obsessions) or behaviors that make them feel driven to do something (compulsions).
  - Environment and genetics seem to play a role
  - Selective serotonin reuptake inhibitors (SSRIs) are commonly prescribed for OCD
  - A behavioral intervention called exposure and response prevention is also effective
- **Panic disorders** cause people to have an overwhelming sense of impending doom, accompanied by sweating, shaking, dizziness, and shortness of breath
  - Benzodiazepines that activate GABA receptors and SSRIs are often prescribed
  - Cognitive behavioral therapy is also effective in treating anxiety disorders
- **Phobias** are intense, irrational fears of a particular object or situation
  - Cognitive behavioral therapy is an effective treatment
- **Post-Traumatic Stress Disorder (PTSD)** causes intense fear, helplessness or horror, and intrusive recollections of a traumatic experience.
  - People can develop PTSD following any traumatic experience, such as combat, sexual abuse, or natural disasters
  - When someone experiences a traumatic event, very high levels of norepinephrine are released in the brain, and norepinephrine remains very high in people with PTSD
  - Benzodiazepines, SSRIs, cognitive behavioral therapy, or eye movement desensitization and reprocessing therapy are among the many treatments that help PTSD patients
- **Neuroscientists** think that cognitive behavioral therapy (such as exposure and response prevention used to treat OCD) work because of **neuroplasticity**. These therapies help replace old, damaging behaviors with new ones, and this may correspond to deleting old/bad synapses and making new ones in the brain.
**Tourette Syndrome** include motor and vocal tics—repetitive, involuntary movements that are rapid, sudden and persist for more than one year

- Tourette syndrome is **inherited**
- Abnormal brain activity in the **basal ganglia** is implicated in Tourette syndrome
- Medication for Tourette syndrome depends on the type of tic—SSRIs, antipsychotic medication, and stimulant medications that are prescribed for ADHD have been demonstrated useful in helping manage Tourette syndrome

**Major depression** causes feelings of sadness, hopelessness, pessimism, lack of interest in life, and reduced emotional well-being

- For an overview, go to: [http://www.brainfacts.org/diseases-disorders/psychiatric-disorders/articles/2012/major-depression/](http://www.brainfacts.org/diseases-disorders/psychiatric-disorders/articles/2012/major-depression/)
- Genes and environment play a role in getting depression
- Abnormal secretion of **stress hormones** by the **hypothalamus** is implicated in depressive symptoms
- Abnormality in the **anterior cingulated gyrus** within the **prefrontal cortex** has also been noted in depressed individuals
- Treatment for depression includes **electroconvulsive therapy** or **deep brain stimulation** (for severely depressed patients), **SSRIs**, and **ketamine**

**Bipolar disorder** causes episodes of deep depression and manic highs, and many people return to normal mood between these episodes. A common misconception is that people with bipolar disorder switch from mania to depression within a short time period, but that is not the case.

- **Genes** play a large role in development of bipolar disorder
- One of the most effective treatments is **lithium**, although the mechanisms underlying lithium isn’t fully understood
- While lithium is helpful for stabilizing manic episodes, patients will often need additional treatment including **SSRIs**, and **valproate**, which was originally developed as an anticonvulsant

**Schizophrenia** causes major disturbances in thinking, cognition, emotional reactions, and social behavior. Delusions, hallucinations, and thought disorder is also common.

- For an overview, go to: [http://www.brainfacts.org/diseases-disorders/psychiatric-disorders/articles/2012/schizophrenia/](http://www.brainfacts.org/diseases-disorders/psychiatric-disorders/articles/2012/schizophrenia/)
- Schizophrenia might be caused by **disruption of neurodevelopment** through a genetic predisposition or environmental factors such as maternal infections or direct brain trauma
- Mutations in genes that control **nerve cell communication** are thought to be involved in increasing the risk for schizophrenia
People with schizophrenia have enlarged **ventricles**, fluid-filled spaces in the brain, as well as reduced size and abnormal functioning in specific brain regions.

Brain systems that use **dopamine**, **glutamate**, and **GABA** appear to be involved in the development of schizophrenia.

**Chlorpromazine**, the first antipsychotic drug, is useful in reducing symptoms of schizophrenia.

The first generation of antipsychotic drugs acted by **inhibiting** certain **dopamine receptors**, which caused side effects that mimicked Parkinson's disease, and patients developed an irreversible movement disorder, **tardive dyskinesia**.

The second generation of antipsychotic drugs were developed to be much more effective than the first generation, and without the risk of developing Parkinsonian effects.

You’ll notice that antidepressants, particularly SSRIs are widely prescribed for numerous different psychiatric disorders. Many neuroscientists are starting to question whether or not antidepressants really work, or whether it’s the ‘placebo effect’ at work. For an article on the subject, go to: http://www.brainfacts.org/diseases-disorders/psychiatric-disorders/articles/2012/do-antidepressants-really-work/