Mental Health: An Introduction

How the Mind Works

The human brain is one of the most complex systems in existence. Even the top brain scientists in the world admit that there's still much about it that we don't understand. Despite all that we don't know, however, there is a great deal that researchers have uncovered in the last 20 or 30 years that has had a profound influence on how we view and treat mental illness.

A Quick Brain Primer

In addition to processing thoughts and emotion, the brain is responsible for every sensation we feel, as well as the basic functioning of our bodies. What are called lower-order brain functions regulate breathing and the beating of the heart. The brain also controls movement and other bodily functions. The brain regulates body temperature, when and how much we sleep, and even the immune system to some degree.

The brain is made up of millions of miles of interconnected nerve fibers comprised of cells called neurons. Neurons operate through bioelectric impulses that travel the network of these cells. Where neurons meet, a chemical system of neurotransmitters transfers the signal from one neuron to the other. When the neurons are damaged, or the neurotransmitters don't function properly, all sorts of problems in thinking, feeling and body function can occur.

Though we don't yet fully understand how and why various mental illnesses develop, one of the breakthroughs of modern science has been a greater understanding of the way that neurotransmitters function.

Proper Transmission

Various types of neurotransmitters are involved in the transmission of signals from one neuron to another. One of the most studied in depression research has been serotonin. Researchers observed in the 1950s that people became depressed when certain chemical compounds suppressed serotonin levels. These discoveries led to the development of most of the modern arsenal of antidepressants. Discoveries about other neurotransmitters, such as norepinephrine and dopamine, have led to still other therapies for a variety of mental illnesses.

Though some experts are skeptical that neurotransmitter problems are the sole cause of mental illnesses, or that the treatments that have been developed work primarily or only because of their effect on neurotransmitters, most brain experts agree that the neurotransmitter system does have a profound influence on proper brain function and potential problems such as depression, anxiety and bipolar disorder.

Hormones

The endocrine system, which produces and regulates the hormones responsible for cell growth, body temperature, appetite and sleep—among other things—is also controlled by the brain, which in turn is affected by hormone levels. If this sounds complicated, that’s because it is.

Some diseases that disrupt hormone levels, such as thyroid disorders and Cushing’s disease, can cause people to become depressed. Researchers are interested in learning more about how the interconnection of the endocrine system and the brain may influence the symptoms of mental illness.

Architecture May Be Key

Some researchers have begun to wonder whether the basic architecture of the brain (for example, how neurons grow and form connections) might play a role in the development and persistence of mental disorders. Scientists used to think that the brain was largely formed and unable to continue growing and changing much once a person reached adulthood.

Since then, researchers have discovered that the brain is more able to regrow and adapt than previously thought. One new area of research is looking into how the architecture of the brain may cause some mental disorders and whether repairing the current architecture or growing entirely new neurological pathways could treat or cure those disorders.

Last Reviewed: June 14, 2010
