

# the ADHD PROGRAM

## WHAT IS ADHD?

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ADHD is the most common childhood psychiatric disorder, affecting behavior and daily functioning in 3 to 5 percent of school-aged children in the United States.

- **Symptoms.** Children may act quickly without thinking and interrupt others (impulsivity), fidget, have difficulty sitting still and staying on-task (hyperactivity), or daydream and get easily sidetracked (inattention).
- **Three types.** ADHD is diagnosed as the hyperactive-impulsive type (no significant inattention), inattentive type (no significant hyperactive-impulsive behavior) or the combined type (both inattentive and hyperactive-impulsive symptoms).
- **Other disorders.** Children with ADHD can suffer from other psychological disorders, including depression, learning disorders, impulse control disorders and autism spectrum disorders. Adults may suffer from substance abuse.
- **Life-long management.** ADHD is a chronic illness requiring long-term treatment strategies.

### Goals of the ADHD Program

- Advance our understanding of the environmental, genetic and physiological causes of attention-deficit/hyperactivity disorder (ADHD)
- Use results of basic research to develop novel and enhanced pharmacological and non-pharmacological treatment options
- Individualize treatments for specific subtypes of ADHD based on genetic, brain imaging and behavioral data

### Revealing the inner workings of the brain

M.I.N.D. researchers are using neuroimaging studies to better characterize abnormalities of brain function and circuitry associated with ADHD. Studies using functional neuroimaging (fMRI) in particular have revealed that the brains of people with ADHD are less efficient than those without the diagnosis. Brain imaging techniques also reveal that people with ADHD may use alternate brain regions and strategies to perform working memory tasks, such as a greater reliance on regions associated with visual and motor processing (e.g., visualizing a phone number in their head to remember it) than verbal strategies (e.g., repeating a phone number to oneself). Drug treatment improves behavior and cognitive performance but does not wholly “normalize” the brain.

### Exploring new treatment options

Understanding how ADHD affects the brain, how genetics affects the development of ADHD and how the environment interacts with brain and genetics is guiding studies of how to better treat children and adults with the disorder.

Treatment usually includes:

**Behavioral therapy.** Traditional approaches to behavior therapy rely on consistently rewarding desirable behavior and removing rewards for inappropriate behavior. New studies of the brain are allowing M.I.N.D. researchers to take behavioral therapy for ADHD to the next level. They hope to identify how to deliver rewards in ways that increase self-control and engage brain regions (e.g., prefrontal cortex) associated with stopping impulsive acts. To help children with ADHD succeed in the classroom, the M.I.N.D. Institute team is committed to developing educational strategies that are consistent with the natural processing strategies of individuals with ADHD.

**Drug therapy.** Stimulants have long been used to treat ADHD. However, 20 percent of children receive no benefit from these drugs or suffer side effects that limit their use. M.I.N.D. Institute researchers are conducting clinical trials of novel drugs and new treatment regimens using existing drugs.

### Raising awareness, establishing community

From recognizing symptoms to evaluating treatment options, raising awareness about ADHD is the key to early diagnosis and effective treatment. The ADHD Program strives to serve as an information and training resource for parents, physicians and teachers. The research team is building a community of patients who can support one another and contribute to the M.I.N.D. Institute's mission to better understand and treat ADHD.

Program faculty will also help guide the curriculum of the Triumph Preschool in Oak Park, a full-inclusion early childhood education collaboration of the M.I.N.D. Institute, UC Davis School of Education and St. HOPE Public Schools.

### The research team

*Julie Schweitzer*, an associate professor of psychiatry and behavioral sciences, is director of the ADHD Program. She is a psychologist with extensive clinical experience treating both children and adults with ADHD. Her imaging studies have revealed some of the abnormal function and circuitry of the ADHD brain, including response to stimulant medication. She is committed to creating a comprehensive ADHD research and treatment program that serves patients, as well as the community at large.

*Blythe Corbett*, a pediatric neuropsychologist, is an assistant professor of clinical psychiatry who diagnoses and assesses children, adolescents and young adults with neurodevelopmental disorders. Her research has primarily focused on the neuropsychological and biological functioning of children with autism spectrum disorders and ADHD. She is particularly interested in how social-emotional, environmental and biological factors are related to brain system and structure development.

*Robert L. Hendren* is a professor of psychiatry and behavioral sciences and executive director of the M.I.N.D. Institute. He has a long history of directing ADHD evaluation and treatment programs and is the principal investigator on numerous clinical trials, including drug and nutritional treatments, for ADHD and other childhood psychiatric disorders.

*Robinder Bhangoo* is a physician, assistant professor of psychiatry and behavioral sciences and director of the Department of Psychiatry Child and Adolescent Psychiatry Clinic. She has a strong background in the interface of research and clinical service and was a National Institute of Health fellow before coming to UC Davis.

*Catherine Fassbender* is a cognitive neuroscientist and post-doctoral research fellow with the UC Davis M.I.N.D. Institute. She studies cognitive control issues in ADHD using brain-imaging methodology.

*Frank Sharp* is a clinical neurologist, neuroscientist and professor of neurology whose studies involve examining the gene expression profiles of children and adults with ADHD and/or Tourette syndrome. He correlates those analyses with cortisol assessments of stress and brain imaging data.

### About the UC Davis M.I.N.D. Institute

The UC Davis M.I.N.D. (Medical Investigation of Neurodevelopmental Disorders) Institute is a unique, collaborative center bringing together parents, scientists, clinicians and educators for research on autism, fragile X syndrome, Tourette syndrome, ADHD, learning disabilities and other neurodevelopmental disorders.

### For more information about the ADHD Program, please contact:

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