High quality MRIs without sedation now possible for children with autism spectrum disorder

UC Davis researchers have found a way to get MRI images of children with autism spectrum disorder (ASD) and intellectual disability without sedating them first using the principles of applied behavior analysis.

MRI is an important tool for understanding the brain-based differences in children with autism, but getting an MRI requires the child to lie still in the scanner for anywhere up to 30 minutes, and even the slightest head movements can lead to a bad MRI scan. Because most investigators assumed that this would be too difficult for more severely impaired children with ASD, most autism studies using MRI have included only children with IQ scores in the normal to above-average range. Sedation or general anesthesia is typically used to get MRI scans of children with autism with lower IQ scores.

Christine Wu Nordahl, a UC Davis MIND Institute faculty member and assistant professor of psychiatry and behavioral sciences, hopes her research will be a guide for others working to better understand neurodevelopmental disorders such as autism.

"If we really want to understand the neural bases of autism, we have to figure out a way to include all children with autism, even those with more severe impairments, in MRI research studies," she said.

Nordahl’s work, published in the Journal of Neurodevelopmental Disorders outlined methods used to obtain high quality MRI images in children with very severe impairments without using general anesthesia. The research engaged board-certified behavior analysts to work with the children.

To create a comfortable and safe environment for the participants, researchers used behavioral strategies aimed at increasing motivation and the child’s sense of control, peer modeling, verbal reminders, visual timers and countdowns. The children were supported throughout the entire process and given either social or tangible reinforcement after they had successfully completed each step.

“Much to our own surprise and pleasure, we were more successful than we hoped and obtained high quality images for all of the children tested thus far,” Nordahl said.
MIND Institute awarded key federal training grant

Adding to its growing portfolio of important federal grants to address the needs of people with developmental disabilities, the UC Davis MIND Institute, in collaboration with California State University Sacramento, was awarded $2.7 million to be spent over five years to train professionals and family members caring for people with autism spectrum disorder (ASD) and other neurodevelopmental disorders.

The Leadership Education in Neurodevelopmental and Other Related Disabilities (LEND) grant funds allow MIND Institute and Sacramento State University faculty members to provide interdisciplinary training in family-centered practice involving the diagnosis and treatment of people with ASD and other neurodevelopmental disorders, especially for those living in under-resourced communities in Northern California.

The program is co-directed by UC Davis MIND Institute faculty member Sally J. Rogers, professor in the Department of Psychiatry and Behavioral Sciences, and Aubyn Stahmer, associate professor in the Department of Psychiatry and Behavioral Sciences, both psychologists whose work in early intervention for ASD is being adopted worldwide. “Thanks to the LEND grant, we now have more resources at the MIND Institute to help advance training for people in Northern California who work with children with developmental disabilities. Many teachers, physical and occupational therapists, speech pathologists, psychologists, psychiatrists and nurses work with these children and families but have not had specific training in autism or other developmental disabilities,” said Stahmer. “We wanted to provide that opportunity, especially for those serving low-resource communities and minority families who are too often diagnosed later.”

MIND Institute awarded key federal training grant

MIND Institute researchers have found that a battery of tests appears to have strong potential for measuring cognitive changes over time for people with intellectual disabilities.

The work could open new doors to research into whether drugs and specialized educational programs or treatments can improve function in people with Down syndrome, fragile X syndrome and other causes of intellectual disabilities.

“The greater goal is to find treatments that improve overall function in people with these disabilities.”

– David Hessl

David Hessl, a UC Davis MIND Institute faculty member and professor in the Department of Psychiatry and Behavioral Sciences, said his research findings, if validated in a larger study now under way, could change the course of research on treatments for intellectual disabilities and other neurodevelopmental disorders.

“Having the ability to measure cognitive change could give new impetus to drug developers to create therapies targeted to the genetic mutations responsible for intellectual disabilities that could be used in clinical trials,” Hessl said. “The greater goal is to find treatments – both pharmaceutical and behavioral – that improve overall function in people with these disabilities.”

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Aubyn Stahmer, director of community-based treatment research at the UC Davis MIND Institute, has received a grant from the National Institute of Mental Health to study different ways to support training to providers who treat children with autism spectrum disorder (ASD).

“This grant is unique because it will allow us to test different ways to better support providers in delivering autism treatments to children in public schools and publicly-funded county mental health clinics.”

– Aubyn Stahmer

The 4-year, $2.7 million grant funds coordinated studies between UC Davis and UC San Diego to test the impact of the “Translating Evidence-based Interventions for ASD: A Multi-level Implementation Strategy (TEAMS)” model. The studies will be conducted in Sacramento, San Diego and Los Angeles.

“This grant is unique because it will allow us to test different ways to better support providers in delivering autism treatments to children in public schools and publicly-funded county mental health clinics,” said Stahmer, associate professor in the Department of Psychiatry and Behavioral Sciences at UC Davis. “If the strategies work, we can use them for practices across different systems that serve children with ASD.”

The TEAMS model includes two strategies to improve delivery of ASD treatments and child outcomes. One is providing leadership training at the schools and mental health clinics to support professionals who work with children. The other is enhancing provider training by engaging teachers and clinicians in proactive problem solving and planning to use the treatment models successfully. Approximately 200 children with autism will benefit each year from working with the providers who participate in the study.

“I’m very excited about this project,” said Stahmer, who will lead the study for UC Davis focusing on testing TEAMS in classrooms. “It will give us an opportunity to work with teachers, clinicians and leaders in public schools and publicly-funded county mental health clinics in California and increase the use of evidence-based practices for students with autism.”

Lauren Brookman-Frazee, associate professor in psychiatry and associate director of the Child and Adolescent Research Center at UC San Diego, also received $2.7 million to lead a study focused on testing TEAMS in publicly-funded outpatient and school-based mental health services in coordination with the MIND Institute.

“I’m thrilled to collaborate with Dr. Stahmer and UC Davis on this large-scale project being conducted in two important service systems for ASD – schools and mental health programs,” said Brookman-Frazee, research director of the Autism Discovery Institute at Rady Children's Hospital in San Diego. “In addition to advancing the science on the most effective methods to implement evidence-based treatments in public service systems, we hope this project serves as a model for cross-site collaboration and data collection between UC campuses and for community-engaged research.”
Fragile X drug trial gets $11.5 million in NIH funding

The MIND Institute and Rush University Medical Center have been awarded $11.5 million from the National Institutes of Health to test a new therapy designed to improve language learning for children with fragile X syndrome.

“There is a great need to improve cognition early in development in fragile X syndrome, and this unique study combines a targeted treatment for this disorder with intensive language intervention.”

– Randi Hagerman

Randi Hagerman received the prestigious 2017 Cal Aggie Alumni Association Emil M. Mrak International Award on Feb. 3. The reward honors a graduate of UC Davis who is distinguished in his or her profession or public service outside the United States.
The MIND Institute welcomed more than a thousand family members to the 13th Annual Thank You Party in December. The event, with its “A Day at the Beach” theme, was a small token of our appreciation to the families who participated in groundbreaking neurodevelopmental research. It was our privilege to provide everyone with a memorable time.
New research grants for the treatment of Angelman syndrome

Two UC Davis researchers have received grants totaling $1.6 million to advance their work to find an effective treatment for Angelman Syndrome, a rare genetic disorder that causes seizures and sleep disturbances and inhibits language development.

“The generous support from FAST and CIRM is recognition of the innovative molecular therapies being developed at UC Davis for Angelman syndrome.”
– David Segal

David Segal, a UC Davis MIND Institute faculty member and professor in the Department of Biochemistry and Molecular Medicine, received $1.1 million, and Joe Anderson, assistant adjunct professor in the Department of Internal Medicine, received $500,000 from the Foundation for Angelman Syndrome Therapeutics (FAST) to pursue two different approaches to developing treatments for the neurologic disease.

The grants, which are in addition to an earlier $140,000 FAST grant awarded to Segal and a $1.1 million California Institute for Regenerative Medicine (CIRM) grant awarded to a team of UC Davis researchers in July, bring the total funding to nearly $3 million and put UC Davis at the forefront of research into the disorder, which occurs in one in 15,000 births.

“The generous support from FAST and CIRM is recognition of the innovative molecular therapies being developed at UC Davis for Angelman syndrome,” Segal said. “The collaborative teams to do this work are here, the knowledge experts are here, and now these sponsors have given us the chance to really try and help kids with this disease.”

Segal is using his grant funding to further develop gene editing technology to reactivate a gene in the brain, known as Ube3a, which is silenced in Angelman syndrome.

The MIND Institute has partnered with INALLIANCE to provide delicious food to staff, faculty and visitors and vocational training for people with developmental disabilities.

Café hours:
8 a.m. to 4:30 p.m.
Monday – Friday
The programs of the MIND Institute range from basic science to treatment studies and programs to teach families about the IEP process and train teachers in evidence-based practices for students with autism. We also have clinical programs that provide diagnostic evaluations, medication management, and behavioral treatments. All benefit from philanthropy, and we work tirelessly to meet potential donors and share information about these programs and different methods of giving.

Going forward, there are three areas of special focus for our philanthropic activities. These are areas in which we have great strength but with enhanced funding can do so much more. Gifts in these areas can help transform the MIND Institute and the families whose lives we hope to touch.

**Technology innovation**

We are increasingly interested in the use of technology to provide services and supports to people with autism and to engage them in research. By using telehealth, wearable technologies, virtual reality, digital games and more, we can help people with autism. We can also collect detailed information about their lives to learn in unprecedented ways about the causes, consequences and potential treatments for the disorder. Our scientists and clinicians have made impressive strides, but we are ready to bring these to scale and invent new technologies to improve quality of life for people affected by autism and their families. So, we have created a fund to support Innovation in Autism, Community, and Technology.

**Treatment advances**

New, targeted pharmaceuticals for treating core symptoms of fragile X syndrome, autism and other neurodevelopmental disorders are quickly being pursued. New clinical trials outcome measures and designs also are emerging. Preliminary data collection is critical to show the promise of these new approaches before seeking federal funding for large-scale studies and use. Philanthropy makes such preliminary data possible. So we are building a Treatment Innovation fund to give our scientists flexibility and ensure they are ready for the next opportunity to help families.

**Transition planning**

Families often face a crisis when their child with a neurodevelopmental disorder leaves school. They may struggle to find meaningful employment, safe and affordable housing and appropriate social and leisure experiences for their sons and daughters. Some high-quality programs and services do exist, but what is lacking is evidence demonstrating benefit and cost effectiveness. That data can turn model programs into policies and practices for implementation on a larger scale and in other contexts. The MIND Institute is committed to partnering with families to create transformative change in the programs and services needed to create meaningful, happy and self-determined lives for people with neurodevelopmental disorders. In support of those efforts, we have created a fund for Innovation in Transition Planning and Adult Life.

We hope you will consider making a gift to one of these funds or to any of our other research, clinical, educational or outreach programs. Thank you!

– Leonard Abbeduto
You can make a difference

You can advance progress toward improved diagnostics, treatments and family support services by making a donation to the UC Davis MIND Institute. Your support will directly help individuals and families living with the challenges of neurodevelopmental disorders – individuals and families living here in Sacramento and around the world.

Gifts of all sizes make a difference, and you can direct your donation to support an area that matters most to you. There are many ways to donate online – by check, payroll deduction through your company’s employee giving campaign, multi-year pledges and in your estate.

Donors are essential partners to the MIND Institute’s continued success. Thank you to all our donors this past year for helping us to make a difference in the quality of life of people living with neurodevelopmental disorders.

If you are interested in learning more about donating, please contact Elizabeth McBride, director of development at 916-703-0221 or ekmcbride@ucdavis.edu or visit give.ucdavis.edu/MIND.